BUREAU OF RECLAMATION

FINAL

Biological Resources Technical Memorandum

Delta Cross Channel Gate Improvements Project, California
Interior Region 10 – California-Great Basin

U.S. Department of the Interior

September 2023

Mission Statements

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

FINAL

Biological Resources Technical Memorandum

Delta Cross Channel Gate Upgrades Project, California
Interior Region 10 – California-Great Basin

Prepared for Reclamation by Stantec Consulting Services Inc.
Contract No. 140R2020P0059

Cover Photo: View of Delta Cross Channel Gates, facing southwest. (Stantec/Nick Eide)

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Abbreviations and Acronyms

%	percent
ºF	degrees Fahrenheit
AMM	Avoidance and Minimization Measure
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CVP	Central Valley Project
CWA	Clean Water Act
D-1641	State Water Resources Control Board Decision 1641
DCC	Delta Cross Channel
Delta	Sacramento-San Joaquin Delta
ESA	Federal Endangered Species Act
FGC	California Fish and Game Code
MBTA	Migratory Bird Treaty Act
MCV	Manual of California Vegetation
NMFS	National Marine Fisheries Service
Porter-Cologne	Porter-Cologne Water Quality Control Act
ppt	parts per thousand
Project	Delta Cross Channel Gate Upgrades Project
Reclamation	United States Department of the Interior, Bureau of Reclamation
ROC on LTO	Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project
RWQCB	Regional Water Quality Control Board
SSC	species of special concern
Stantec	Stantec Consulting Services Inc.
SWP	State Water Project
State Water Board	State Water Resources Control Board
USACE	Department of the Army, U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WOTUS	waters of the United States

Chapter 1 Introduction

The United States Department of the Interior, Bureau of Reclamation (Reclamation) is evaluating the ability to operate the Delta Cross Channel (DCC) gates more frequently and potential improvements to automate and streamline operations of the DCC gates. The Delta Cross Channel Gate Upgrades Project (Project) was initiated by the Reclamation California-Great Basin Region to evaluate concepts to accomplish the following:

- Improve ease of operation with remote operated gates
- Increase operational life of facility
- Address safety issues
- Decrease ongoing operations and maintenance costs
- Maintain or improve safety of recreational boaters
- Allow maintenance on current system

The scope of the Project is to evaluate the ability to operate the DCC gates more frequently in accordance with the Biological Opinion on Long-term Operation of the Central Valley Project and the State Water Project. Issued by the National Marine Fisheries Service (NMFS 2019); develop an appraisal technical memorandum (TM) with several concepts to operate the gates more frequently; and develop a feasibility TM for concepts.

1.1 Scope of this Report

This Biological Resources TM was prepared to identify and describe the sensitive biological resources (e.g., special-status species and their habitats, aquatic resources subject to agency jurisdiction) that may occur in or near the DCC gate facility

The sensitive biological resources identified in/near the DCC gate facility are based on information gathered from a review of desktop resources including existing literature, data, and maps; and from reconnaissance-level and select focused surveys of the study area. The study area for the purposes of this report encompasses approximately 21 acres and the Project's proposed components, such as potential staging areas and areas where ground disturbance may occur.

The overall purpose of this report is to:

- characterize the vegetation communities present in the study area;

- evaluate the potential for special-status plant and animal species and their habitats to occur in the study area and immediate vicinity;
- provide the locations and approximate boundaries of aquatic resources (i.e., potential waters of the United States [WOTUS] and waters of the state) in the study area; and
- summarize the results of the desktop and field survey findings

1.2 Project Background

Constructed as an initial feature of the Central Valley Project (CVP) in 1951, the DCC is a controlled diversion channel between the Sacramento River and Snodgrass Slough, located near Walnut Grove, California (Figure 1-1). The channel is 6,000 feet long, has a bottom width of 210 feet, and a capacity of 3,500 cubic feet per second (cfs). Near the entrance, or upstream end, of the DCC, there are two 60-foot-wide by 30-foot-tall radial gates weighing a total of 243 tons that can open to allow water to flow down the channel or close to prevent endangered fish species from being drawn into the interior Delta. The gates structure extends across the full width of the channel and, when open, provides a 120 foot wide opening capable of passing up to 3,500 cfs of fresh water from the Sacramento River into Snodgrass Slough and the Lower Mokelumne River, which flows into the central part of the Delta and to the pump facilities of the CVP and State Water Project (SWP) – C.W. "Bill" Jones Pumping Plant (Jones Pumping Plant) and Harvey O. Banks Pumping Plant (Banks Pumping Plant), respectively.

The DCC gates are operated to manage water quality throughout the central part of the Delta and at the CVP and SWP pumping facilities. Reclamation operates the DCC gates in the open position to do the following: (1) improve the movement of water from the Sacramento River to the export facilities at the Banks and Jones Pumping Plants; (2) improve water quality in the central and southern Delta; and (3) reduce salinity intrusion rates in the western Delta. During the late fall, winter, and spring, the gates are periodically closed to protect out-migrating salmonids from entering the interior Delta and to facilitate meeting flow objectives for fish passage. Additionally, whenever flows in the Sacramento River at Sacramento reach 20,000 to 25,000 cfs on a sustained basis, the gates are closed to reduce any potential scouring and flooding that may occur within the channels on the downstream side of the gates.

The DCC gate facility is more than 65 years old, and its gates rely on operators that must travel to the facility to change their position. Currently, Reclamation staff must drive 1.5 hours each way to open or close the DCC gates from Reclamation's Tracy Operations Office. There are two gates; each one takes 25 minutes to open or close.

The DCC gates are currently operated according to the State Water Resources Control Board Decision 1641 (D-1641) standards and Reclamation's Proposed Action described in the Final Biological Assessment for Reinitiation of Consultation on the Coordinated Long-Term Operation of the CVP and SWP (ROC on LTO) (Reclamation 2019) (Table 1-1).

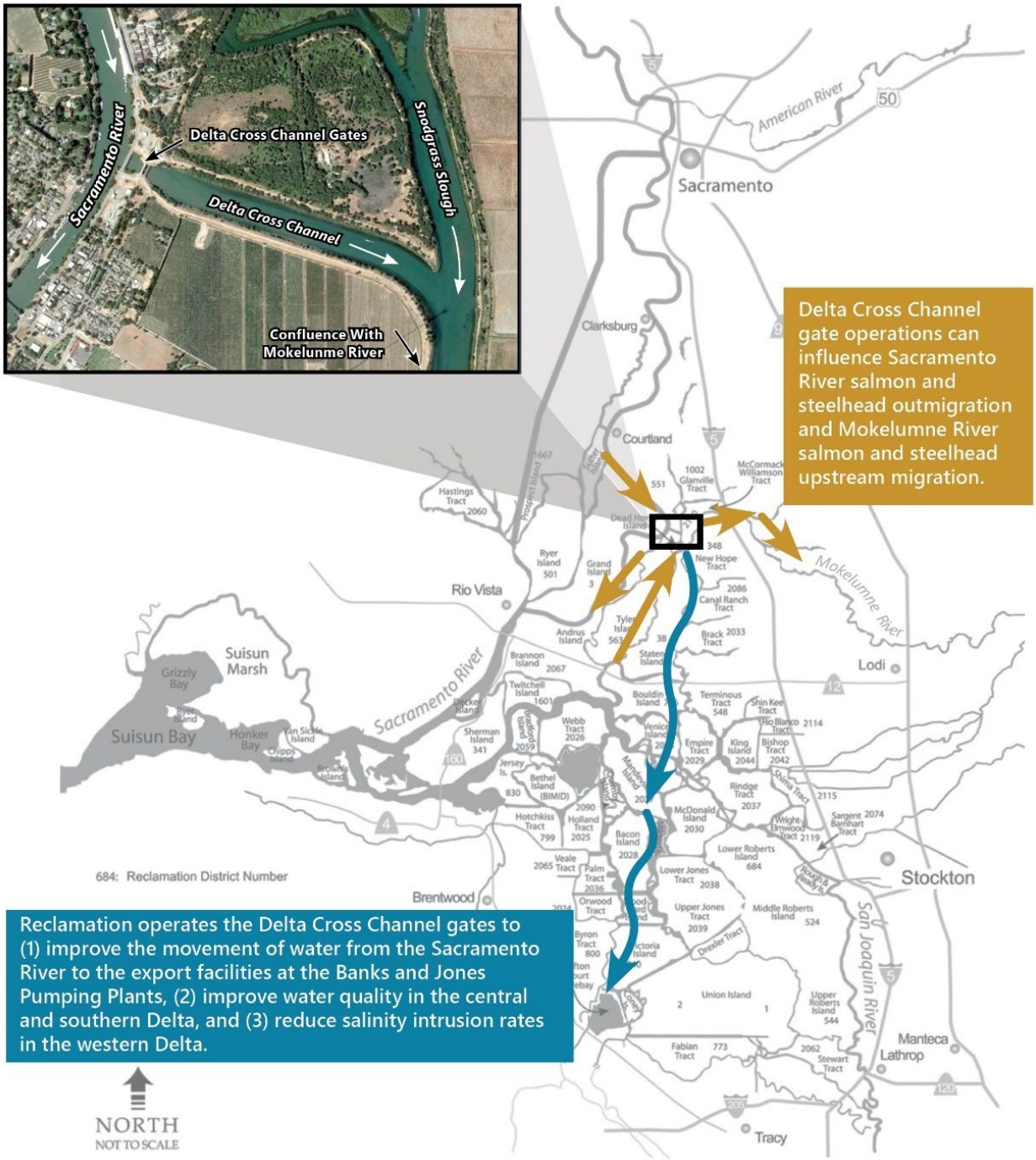


Figure 1-1. Delta Cross Channel Gate Facility Location and Overview Map

Table 1-1. Operations of Delta Cross Channel Gates Identified in the Final Biological Assessment for Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project

Timeframe	Delta Cross Channel Gate Position[1]
October 1 to November 30	Open, unless monitoring indicates a higher risk of fish presence
December 1 to January 31[2]	Closed, except to prevent exceeding a D-1641 water quality threshold
February 1 to May 20	Closed, consistent with D-1641
May 21 to June 15	Closed for a total of 14 days, consistent with D-1641
June 15 to October 1	Open, except to meet Emmaton salinity or Rio Vista minimum flow requirements

Source: Reclamation 2019

Notes:

[1] Whenever flows in the Sacramento River at Sacramento reach 20,000 to 25,000 cfs, the gates would be closed to reduce potential scouring and flooding that might occur in the channels on the downstream side of the gates.

[2] If drought conditions are observed (i.e., fall inflow conditions are less than 90 percent of historic flows) Reclamation will consider opening the DCC gates no more than twice with a maximum possible length of five days to avoid D-1641 water quality exceedances.

Key:

D-1641 = State Water Resources Control Board Decision 1641

Reclamation's Proposed Action described in the Final Biological Assessment for ROC on LTO of the CVP and SWP (Reclamation 2019) included the evaluation of improvements to automate and streamline operation of the DCC gates. However, Reclamation is uncertain if the structural capability of the existing gates allows them to be operated more frequently. Two staff gages, one in the Sacramento River and one in the DCC, currently allow operators to ensure water surface elevations are balanced before opening the gate. The existing hoist system used to operate the gates has manually operated hooks, added to the gate after its original construction, that are used to lock or dog the gate in the full open position.

Recreational boaters use the DCC to shorten travel times between the Sacramento River and Snodgrass Slough by traveling under the gates. If the DCC gates are shut, boat traffic must travel an additional 1-2 hours around the island, which is bounded by the Sacramento River, Threemile Slough, San Joaquin River, North Mokelumne River, and Snodgrass Slough. Boats will try to cross under the DCC gates as they are closing or opening, creating safety concerns. Additionally, boaters state that they do not hear the warning horn prior to the gate closing or opening, or see visual signage warning of imminent gate operations. Frequent operation of the DCC gates, as required under Federal ESA biological opinions issued to Reclamation (NMFS 2019, USFWS 2019) and State Water Resources Control Board Decision D-1641, increases the probability of facility failure. Additionally, one of the handrails on the top deck of the DCC gate facility does not currently meet Occupational Safety and Health Administration requirements.

Reclamation proposes to evaluate improvements to automate operation of the DCC gates. Reclamation would modernize the DCC's gate materials and mechanics to include adding industrial control systems, decreasing additional staff time, and improving physical and biological monitoring associated with the DCC gate facility's daily and/or tidal operations, as necessary, to maximize water supply deliveries.

1.3 Study Area

The Study Area for the Project is shown in Figure 1-2 and includes land owned by Reclamation in the vicinity of the DCC gate facility, including the DCC, between the communities of Locke and Walnut Grove, California. Additionally, the Study Area includes the confluence of the DCC and Sacramento River. The study area lies within the *Isleton California* U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1-3) with the center of the study area generally located at 38.2466° latitude, -121.5096° longitude. The study area evaluated for the Project consists of assessor's parcel numbers 146-0160-021, 146-0150-001, 146-0150-006, 146-0150-010, 146-0160-022, and 146-0150-009.

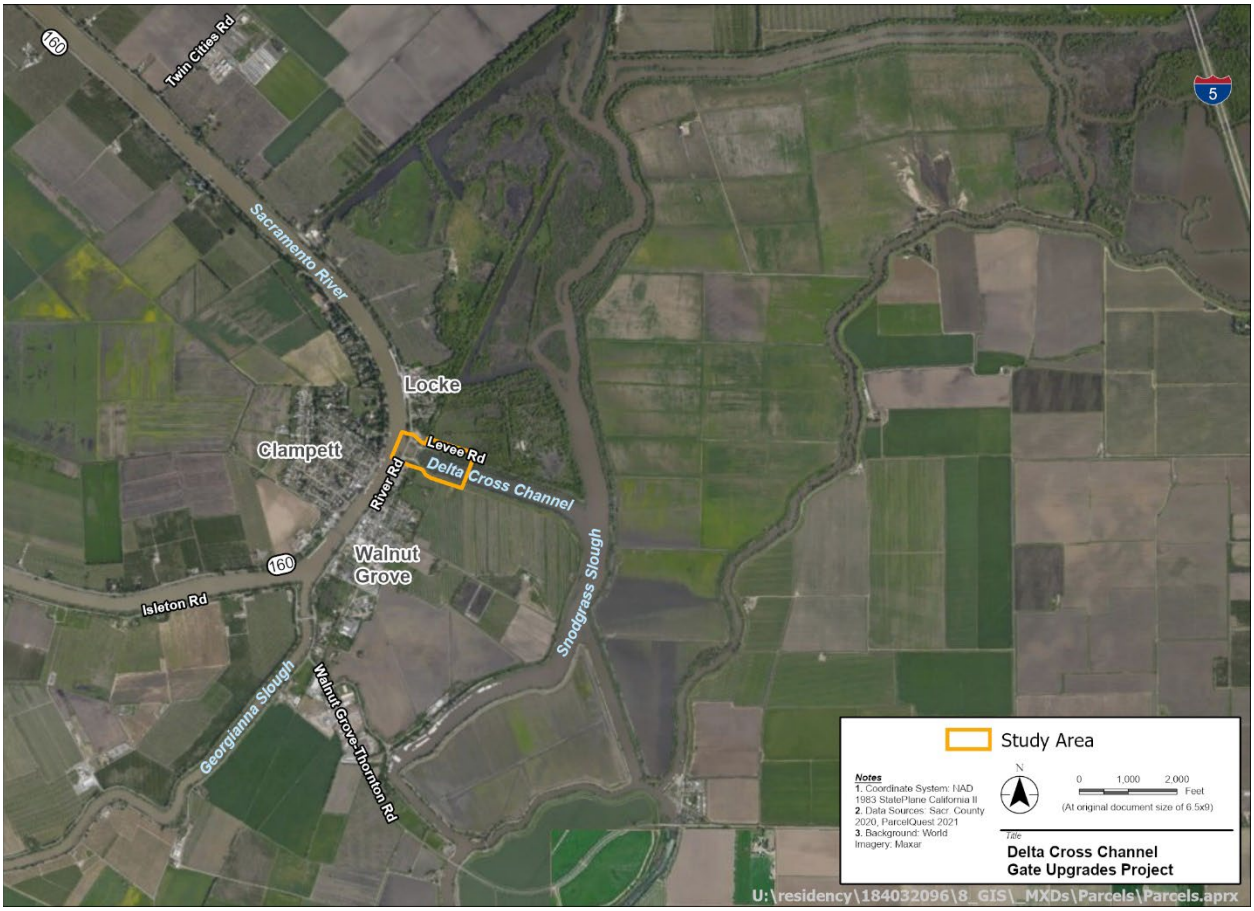


Figure 1-2. Study Area for the Delta Cross Channel Gate Upgrades Project

Delta Cross Channel: The DCC connects the Sacramento River to Snodgrass Slough which flows into the lower Mokelumne River into the central part of the Delta, and on to the pump facilities of the CVP and SWP. The channel is 6,000 feet long, has a bottom width of 210 feet, and a capacity of 3,500 cfs. The DCC passes under a roadway bridge near its upstream end, passes through the DCC gate facility about 120 feet downstream of the bridge, and then about a mile downstream to Snodgrass Slough (see Figure 1-3).

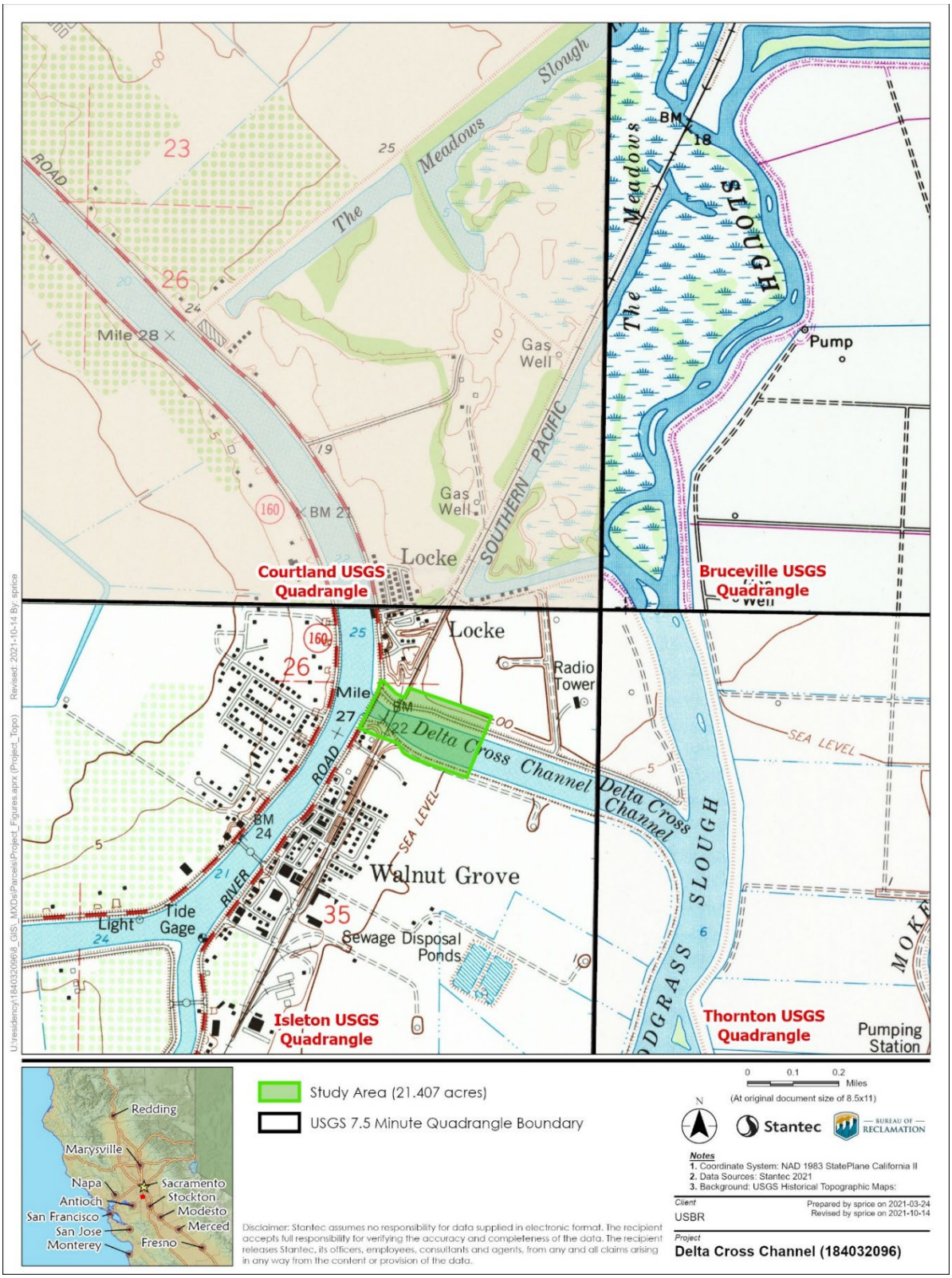


Figure 1-3. Applicable Quadrangle for the Delta Cross Channel Gate Upgrades Project Study Area

Site Access: The DCC gate facility is accessible from both north and south of the DCC via paved two-lane roads. From the north, the site is accessible via exit 498 of southbound Interstate-5, headed west on Twin Cities Road approximately 4.2 miles, turning south on River Road and traveling about 1.7 miles to the DCC access road labeled on maps as Levee Road. Access from the south is available via exit 493 of northbound Interstate-5, heading west on West Walnut Grove Road approximately 5.3 miles, turning north on River Road and traveling about 1 mile to the DCC access road (Levee Road). Small, gravel parking areas are available on the north and south sides of the DCC near the structure (See Figure 1-4). The gravel DCC access road continues past the DCC Gate Structure for recreation access to the Delta Meadows River State Park (currently closed). Undeveloped areas immediately upstream and downstream of the DCC gate facility provide recreational fishing access in the DCC.

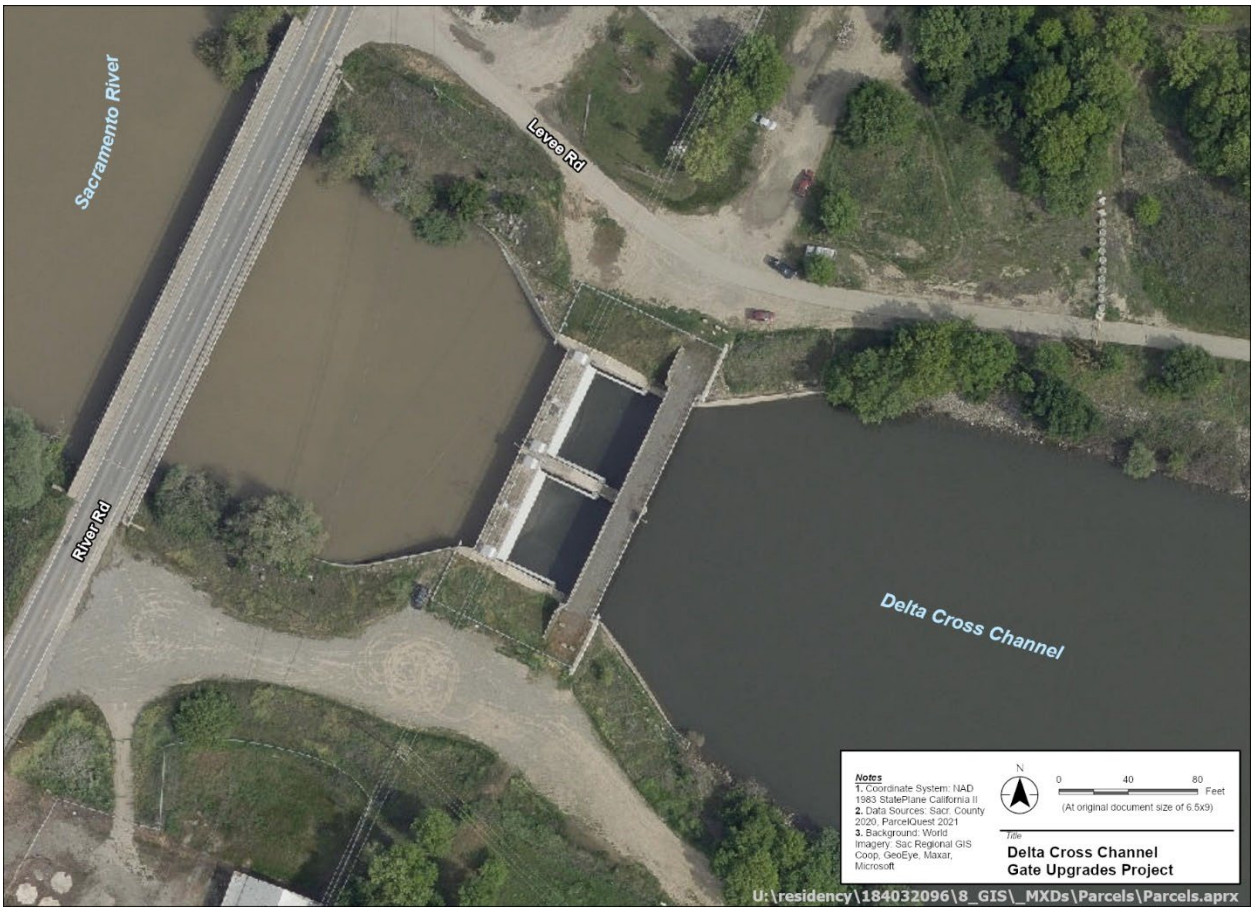


Figure 1-4. View of Delta Cross Channel Gate Facility Access and Parking Areas

Land Ownership: The land surrounding the DCC and DCC gate facility is a mix of Federally owned areas (the channel itself and lands immediately adjacent to the channel and structures), State owned parcels (north of the channel), and privately held parcels (north of the structure, south of the channel, and decommissioned railroad bridge and right of way downstream of the Gate Structure is located). Reclamation holds a permanent easement for the private property associated with the decommissioned railroad bridge to construct, operate, and maintain the bridge and the access roads

on either side of the bridge. As noted above, the Delta Meadows River State Park area, located northeast of the DCC gate facility, is currently closed. Figure 1-5 below provides a general overview of real estate holdings surrounding the channel.

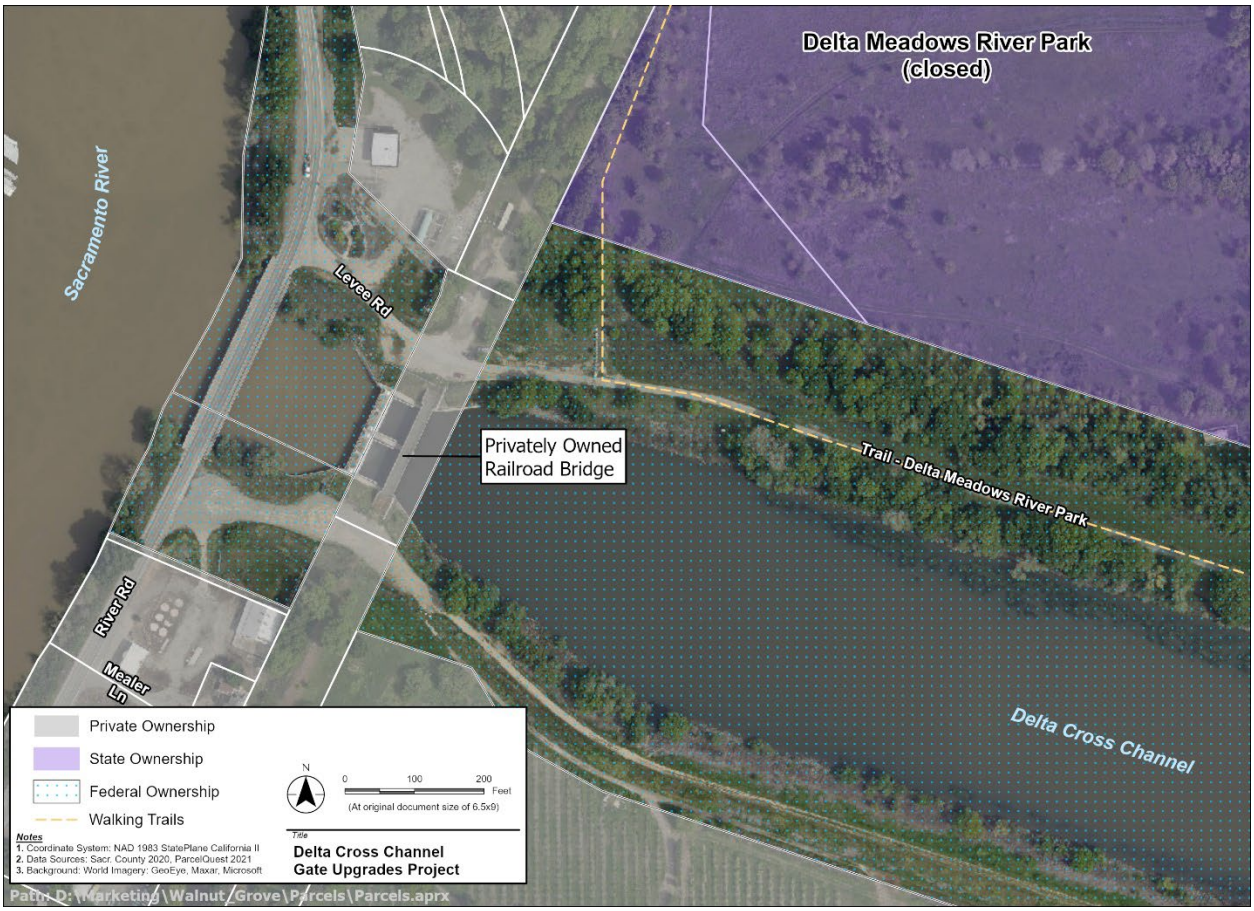


Figure 1-5. Land Ownership Surrounding the Delta Cross Channel Gate Facility

Chapter 2 Methods

The analysis presented in this report includes a desktop review of existing literature, databases, and other publicly accessible sources of information about sensitive biological resources known to occur in/near the study area. Field surveys were performed following the desktop review to determine the potential for the biological resources identified during the desktop review to occur in the study area.

2.1 Desktop Review

Sensitive biological resources that may occur in the study area were determined, in part, by reviewing natural resource agency databases, literature, and other relevant sources. The following information sources were reviewed:

- USGS California 7.5-minute topographic quadrangles for *Thornton, Isleton, Rio Vista, Liberty Island, Courtland, Bruceville, Bouldin Island, Terminous, and Jersey Island*;
- Aerial photographs of the study area and surrounding vicinity (Google Earth 2021);
- United States Fish and Wildlife Service (USFWS) list of endangered and threatened species that may occur in the study area (USFWS 2021a) (Attachment A);
- USFWS National Wetlands Inventory (USFWS 2021b)
- The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) plant and animal records within five miles of the study area (CDFW 2021a) (Attachment A) and the California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants (CNPS 2021) records for the *Isleton California* USGS 7.5-minute topographic quadrangle and the quadrangles immediately adjacent (i.e., reviewed 9 quadrangles total);
- *Special Animals List* (CDFW 2021b);
- *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2021c);
- *State and Federally Listed Endangered, Threatened and Rare Plants of California* (CDFW 2021d);
- *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2021e);
- California Wildlife Habitat Relationships System (CDFW 2014); and

- Other pertinent databases and literature, including *The Jepson Manual: Vascular Plants of California*, *Second Edition* (Baldwin et. al. 2012) including applicable errata and supplements (Jepson Flora Project 2021).

Based on this background research, a list of special-status species that have the potential to occur or are known to occur in the study area and vicinity was developed. The list was refined based on reconnaissance-level and focused biological field surveys to determine the potential for those species to occur in the study area.

2.2 Field Survey Methods

A variety of biological surveys were conducted between March and August 2021, as summarized in Table 2-1, within the study area to evaluate and assess the potential for the sensitive biological resources identified during the desktop review to occur. These surveys included focused surveys such as botanical surveys during species specific blooming periods in accord with CDFW protocols, aquatic resources delineation in accord with applicable agency guidelines, and Swainson's hawk (*Buteo swainsoni*) protocol-level surveys following CDFW guidelines. The general timing and methods applied for the protocol-level surveys are further described below. Habitat assessment surveys were also performed to assess the potential for suitable habitat for the remaining special-status species to occur in the study area, including a concerted focus on giant garter snake (*Thamnophis gigas*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), western burrowing owl (*Athene cunicularia*), and special-status bat species.

Table 2-1. Summary of Personnel and Survey Dates

Survey	Staff Name and Position	Survey Dates
Botanical Surveys	• John Holson, Senior Botanist/Professional Wetland Scientist • Meghan Oats/Senior Botanist	May 19 and August 11, 2021
Aquatic Resources Delineation	• Meghan Oats/Senior Botanist • Brendan Cohen, Biologist	March 12, 2021
Giant Garter Snake Habitat Assessment	• Sara Cortez, Senior Biologist • Robert Stoddard, Senior Biologist	March 30, 2021
Swainson's Hawk Protocol Survey	• Sara Cortez, Senior Biologist • Chariss Femino, Staff Biologist	March 28-30, 2021; April 1, 13-15 2021; June 29-30, 2021; July 1, 2021
Burrowing Owl Habitat Assessment Survey	• Sara Cortez, Senior Biologist • Chariss Femino, Staff Biologist	March 29, 2021
Valley elderberry longhorn beetle Surveys	• Mark Noyes, Senior Biologist	March 12, 2021
General Wildlife Surveys	• Chariss Femino, Staff Biologist • Brendan Cohen, Biologist	July 1 2021

2.2.1 Aquatic Resources Delineation Surveys

A delineation of aquatic resources within the study area was conducted on March 12, 2021, by a team of two Stantec biologists and boundaries were confirmed on June 6, 2023. The team consisted of Meghan Oats (Task Lead, Biologist) and Brendan Cohen (Biologist). Meghan Oats has over seven years of experience as a biologist and holds a Bachelor of Science in Biology from University of California at Davis. Brendan Cohen has over six years of experience as a biologist and holds a Bachelor of Science in Ecology and Evolutionary Biology from University of California at Santa Cruz.

The delineation was performed to identify aquatic resources that may be subject to agency jurisdiction (i.e., U.S. Army Corps of Engineers (USACE), State of California Water Resources Control Board (State Water Board)/Regional Water Quality Control Board [RWQCB], CDFW). Aquatic resources (i.e., WOTUS and waters of the state) were delineated consistent with the USACE and State Water Board methodologies as described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps Wetland Delineation Manual: Arid West Region* (USACE 2008), and the *Implementation Guidance for the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Board 2020).

2.2.2 Botanical Surveys

Focused botanical surveys were conducted by a team of two Stantec biologists on May 19 and August 11, 2021. The team consisted of John Holson (Task Lead, Senior Botanist) and Meghan Oats (biologist). John Holson has over 15 years of experience in California as a botanist and holds a Bachelor of Science Degree in Ecology and Evolutionary Biology, from University of California at Santa Barbara.

The botanical surveys consisted of a pedestrian survey of the study area where accessible and safe to do so, using meandering transects per the CNPS (CNPS 2001) and CDFW guidelines (CDFW 2018). Portions of the study area that were inaccessible due to safety concerns were surveyed using binoculars. Areas that were developed or unvegetated were checked to confirm vegetation but not covered in meandering transects. Timing of the field survey coincided with the spring and summer blooming period(s) for regionally occurring special-status plants that have potential to occur in the study area; and as such, represents a comprehensive survey effort for the species identifiable during the spring and summer. Collectively, the May and August field visits covered the time period when the potential special-status plants would be identifiable in the region and constitutes a floristic survey.

The botanical field surveys were floristic in nature, and each species observed was identified to the taxonomic level necessary to determine whether or not the plant is listed as a special-status species. Plant taxonomy follows the *Jepson Flora Project* (2021). Vegetation mapping followed the technical approach and vegetation alliance classification system described in the Manual of California Vegetation (MCV) (CNPS 2021a). Each vegetation community identified during field mapping was checked for sensitivity against the California Natural Community List (CDFW 2021f). Stantec botanists mapped vegetation in the field by walking through the study area and assessing vegetative

cover within stands. The full extent, or a representative portion, of all vegetation communities mapped in the study area were visited during the field survey. Vegetation communities were classified to the level necessary (i.e., alliance or association) to determine sensitivity. Plant species composition, stand structure, regional occurrence, and other notable characteristics were collected. After completion of the survey, the pre-field vegetation map was updated with field observations.

To the extent practicable, nearby reference populations of special-status species were visited to help ensure that the Stantec botanists had an accurate search image for a species and to determine whether the species was identifiable at the time of the survey. Reference site visits were made for plant occurrences near the study area that were documented by the CNDDB and Calflora (2021). Species identification was confirmed using the Jepson Flora Project (2021). Reference site visits were made on May 18 and 19, as well as August 10, 2021, and are detailed below in Table 2-2.

Table 2-2. Special-status Plant Species Reference Site Visits

Species	Location Source and Occurrence Number	Date of Visit	Species Identified?	Location	Notes
Carex comosa bristly sedge	California Natural Diversity Database Occ: 6448	5/19/21	Yes	Delta Meadows River Park, on edge of canal in riprap	One individual in flower and fruit
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	Calflora IDs: mu6633, mu6632	5/18/21; 8/10/21	Yes	2372-2398 County Rd 22, Woodland, CA 95776, on ditch border south of the road	May visit: 15 individuals; last year's fruits and this year's leaves; blooming at August visit.
Lilaeopsis masonii Mason's lilaeopsis	California Natural Diversity Database Occ: 544	5/18/21 8/10/21	Yes	Edge of Bank at Deepwater Ship Channel, West Sacramento	May visit: One individual; early flower August visit: several individuals; full bloom
Symphyotrichum lentum Suisun Marsh aster	California Natural Diversity Database Occ: 6234	5/19/21	Yes	Delta Meadows River Park, on edge of canal in riprap	Four individuals in flower and fruit
Extriplex joaquinana San Joaquin spearscale	CalFlora ID: po37838	8/10/21	Yes	Roadside on the northwest side of intersection of County Roads 25 and 103, Woodland.	Over 100 individuals; 80% senesced, 20% fruit

2.2.3 Valley Elderberry Longhorn Beetle

A biological field survey focusing on valley elderberry longhorn beetle and their host plant (elderberry shrubs [*Sambucus* spp.]) was conducted on March 12, 2021, by Stantec Senior Biologist Mark Noyes, who has over 14 years of experience as a biologist and holds a Bachelor of Science in Biological Sciences (Plant Biology Emphasis) and a Master of Science in Ecology (Restoration Emphasis) from University of California at Davis.

Prior to conducting fieldwork, a database search of the CNDDB to determine the location of reported valley elderberry longhorn beetle occurrences in the vicinity of the study area (CDFW 2021a) was performed. No CNDDB occurrences for this species are present within 5 miles of the study area. A pedestrian survey of the study area was performed for elderberry shrubs and an assessment of habitat valley elderberry longhorn beetle in accord with the USFWS *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (USFWS 2017). Findings of the habitat assessment determined that the species' host plant is absent from the study area and a 165-foot survey buffer (per the USFWS survey guidelines); therefore, further focused surveys were not required and the species is not evaluated further in this report.

2.2.4 Giant Garter Snake

A giant garter snake habitat assessment was conducted by a team of two Stantec biologists on March 30, 2021. The team consisted of Sara Cortez (Task Lead, Senior Botanist) and Rob Stoddard (Senior Biologist). Sara Cortez has over 15 years of experience in California as a biologist and holds a Bachelor of Science Degree in Environmental and Resource Sciences (Hydrobiology Emphasis), from University of California at Davis. Robert Stoddard has over 15 years of experience as a biologist and holds a Bachelor of Science in Biology from University of Oregon at Eugene.

Prior to conducting fieldwork, Stantec biologists performed a database search of the CNDDB to determine the location of reported giant garter snake occurrences in the vicinity of the study area (CDFW 2021a). The CNDDB recorded two separate occurrences of giant garter snake within 0.5-miles of the study area. Details of the CNDDB occurrences are provided in Attachment A.

A pedestrian survey of the study area was performed during which habitat characteristics were recorded and assessed based upon recognized habitat characteristics of giant garter snake and their life history, distribution, and habitat requirements. A habitat classification of suitable, marginal, or unsuitable was applied to all aquatic and upland habitat types.

2.2.5 Western Burrowing Owl

A western burrowing owl habitat assessment was conducted by a team of two Stantec biologists on March 29, 2021, according to the methodology described in the Burrowing Owl Survey Protocol and Mitigation Guidelines (The California Burrowing Owl Consortium 1993). The team consisted of Sara Cortez (Senior Botanist) and Chariss Femino (Associate Biologist). Chariss Femino has over 11 years of experience as a biologist (specializing in wildlife species) and holds a Bachelor of Arts in Environmental Studies and Planning from Sonoma State University.

Prior to conducting fieldwork, Stantec biologists performed a database search of the CNDDB to determine the location of reported western burrowing owl nests in the vicinity of the study area (CDFW 2021a).

On March 29, 2021, surveys were performed in conjunction with Swainson's hawk nesting surveys (as described below) to assess habitat types and suitability of the study area for western burrowing owl. The habitat assessments determined that suitable habitat for western burrowing owl is absent from the study area; and as such, protocol-level surveys were not performed and the species is not evaluated further in this report.

2.2.6 Swainson's Hawk

Field surveys for Swainson's hawk were conducted by a team of two Stantec biologists on various dates between March-July 2021. The team consisted of Sara Cortez (Senior Botanist) and Chariss Femino (Associate Biologist).

Prior to conducting fieldwork, Stantec biologists performed a database search of the CNDDB to determine the location of reported Swainson's hawk nests in the vicinity of the study area (CDFW 2021a).

Protocol level surveys for Swainson's hawk were performed according to the methodology described in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Protocol) (Swainson's Hawk Technical Advisory Committee 2000). The Protocol requires surveys be completed over the course of the five survey periods during the following timeframes:

- One survey between January and March 20 during Period I
- Three surveys between March 20 and April 5 during Period II
- Three surveys between April 5 and April 20 during Period III
- No surveys between April 20 and June 10 during Period IV
- Three surveys between June 10 and July 30 during Period V

Stantec biologists conducted protocol level surveys to identify potential nests that could be utilized by Swainson's hawks and other nesting raptors along the entire study area alignment. The area surveyed during the Swainson's hawk survey consisted of the study area and a survey buffer of 0.5-miles (16,022 total acres) around the study area.

All surveys were performed by both driving along accessible roads within the Swainson's hawk survey area and walking to observe nests when unable to access with a vehicle. Observations were made using binoculars and spotting scopes. The following information was recorded (depending on access and visibility) using a mapping grade global positioning system:

- Swainson's hawk observations and behavior

- active raptor nests within the study area
- inactive raptor-sized nests within the study area
- change in nest status between surveys

Chapter 3 Regulatory Context

3.1 Federal Regulatory Requirements

3.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (ESA) of 1973 was established to protect and recover endangered and threatened species and the ecosystems upon which they depend. According to the ESA "endangered" indicates a species is in danger of extinction throughout all or a significant portion of its range. In addition, the ESA defines a species as "threatened" if that species is likely to become endangered within the foreseeable future. The USFWS maintains a list of endangered and threatened species. The USFWS and NMFS administer ESA and are responsible for consulting with other federal agencies pursuant to ESA. Consultation with the USFWS and/or NMFS would be necessary if a proposed project action has the potential to affect federally listed species, their habitat, as well as areas of Designated Critical Habitat. This consultation would proceed under Section 7 of the ESA for the Project.

3.1.2 Sustainable Fisheries Act (Essential Fish Habitat)

In response to growing concern about the status of United States fisheries, Congress passed the Sustainable Fisheries Act of 1996 (Public Law 104 297) to amend the Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265), the primary law governing marine fisheries management in the Federal waters of the United States. Under the Sustainable Fisheries Act, consultation is required by NMFS on any activity that might adversely affect essential fish habitat (EFH), which includes those habitats on which fish rely on throughout their life cycles. The EFH encompasses habitats necessary to allow sufficient production of commercially valuable aquatic species to support a long-term sustainable fishery and contribute to a healthy ecosystem. Chinook salmon are managed under EFH by NMFS within the DCC.

3.1.3 Clean Water Act

The objective of the Clean Water Act (CWA) of 1977, as amended, is to maintain and restore the chemical, physical, and biological integrity of the nation's waters. The discharge of dredged or fill material into WOTUS, including jurisdictional wetlands, is regulated under Section 404 of the CWA by the USACE via a permitting process. Surface water quality is further regulated by the United State Environmental Protection Agency (i.e., USEPA); which in California this authority is delegated to the State Water Board or the RWQCB. Applicants for Section 404 permits are also required to comply with Section 401 of the CWA by obtaining Water Quality Certification through the State.

3.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 enacts the provisions of treaties between the United States, Great Britain, Mexico, Japan, and the Soviet Union and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. This treaty prohibits "take," which has been variously defined to include harming any migratory bird listed under the MBTA, including nests, eggs, and/or young.

3.1.5 Executive Orders

Federal agencies are required to demonstrate that their actions comply with Presidential Executive Orders established to protect the environment. Relevant Executive Orders include the following:

- **Executive Order 11990 (Wetlands):** For Projects that could affect wetlands, federal agencies are required to demonstrate that no practicable alternative exists to avoid the wetland(s) and that all practicable avoidance, mitigation, and/or preservation measures have been incorporated into a project to minimize impacts to wetlands. Federal agencies are also required to provide opportunity for early public review of any plans or proposals for new construction in wetlands.

- **Executive Order 11988 (Floodplain Management):** For projects that may be located in a floodplain, federal agencies are required to evaluate the effects of the action on the floodplain and identify practicable alternatives or measures to avoid long- and short-term adverse impacts associated with the occupancy and modification of the floodplain and to avoid incompatible development in the floodplain.

- **Executive Order 13112 (Invasive Species):** Federal agencies are required to prevent the introduction of invasive species and not authorize actions that could cause or promote the introduction or spread of invasive species. Federal agencies need to identify feasible and prudent measures to minimize the risk of harm caused by invasive species.

- **Executive Order 13186 (Migratory Birds):** Federal agencies are required to evaluate the effects of their actions on migratory birds, with emphasis on species of concern, and to minimize the take of migratory birds through development of procedures for evaluating such take and conservation efforts in coordination with the USFWS. This Executive Order further implements the MBTA and requires coordination between the USFWS and federal agencies.

3.2 California Regulatory Requirements

3.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) prohibits "take" of plants or animals listed as endangered or threatened and protects native species of fishes, amphibians, reptiles, birds,

mammals, invertebrates, and plants, and their habitats, that are threatened with extinction or experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation. "Take" is defined in Section 86 of the California Fish and Game Code (FGC) as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA authorizes the CDFW to issue incidental take permits for state-listed species, when specific criteria are met.

3.2.2 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne) authorizes the State Water Board to oversee water rights and water quality policy, and as such has established nine RWQCBs to protect and enhance water quality at the regional and local levels. In addition to preparing Water Quality Certifications to designate beneficial uses of water bodies in each region, the RWQCBs issue a permit referred to as a Waste Discharge Requirement for activities that result in pollutant or nuisance discharges that may affect surface or groundwater. This includes isolated wetlands not subject to the jurisdiction of the USACE.

3.2.3 California Fish and Game Code

The California FGC has several provisions for the protection of waters of the state, and the special-status plant, fish, and wildlife resources, including their habitat. The applicable California FGCs are as follows:

- **Sections 1600-1616 (Streambed Alteration):** The CDFW is responsible for the protection and conservation of fish and wildlife resources in California. Under Section 1602, CDFW has the authority to issue Lake or Streambed Alteration Agreements for construction activities that substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the CDFW as providing resources for fish or wildlife.

- **Sections 1900-1913 (Native Plant Protection Act):** The Native Plant Protection Act of 1977 prohibits the taking, possessing, or sale within the State of any plants that the CDFW has determined are rare, threatened, or endangered. The CDFW has the authority to enforce the provisions of this act and authorize measures to salvage native plants that may otherwise be affected by project activities, if deemed appropriate.

- **Sections 3500-3516 (Game Birds and Birds of Prey):** The CDFW protects game birds, birds of prey, migratory birds, and fully protected birds and their nests, eggs, and young from take or possession, except as otherwise provided by the code (e.g., incidental take under CESA).

- **Sections 3511, 4700, 5050, and 5515 (Fully Protected Species):** California statutes accord a "fully protected" status to specific birds, mammals, reptiles, amphibians, and fish. These species cannot be "taken," and no process exists for issuance of incidental take permits for fully protected species.

Chapter 4 Environmental Setting

4.1 Physical Resources

As described previously, the Study Area for the Project is shown in Figure 1-2 and includes land owned by Reclamation in the vicinity of the DCC gate facility, including the DCC, between the communities of Locke and Walnut Grove, California. It lies within the USGS *Isleton, California* 7.5-minute topographic quadrangle (Figure 1-2).

Precipitation in the study area primarily occurs as rain, with an average annual rainfall of approximately 17.71 inches. Air temperatures range from an average January high of 54 degrees Fahrenheit (ºF) to an average July high of 92ºF. The year-round average high temperature is approximately 74ºF (Western Regional Climate Center 2021).

4.1.1 Geology and Soils Resources

The DCC is an excavated channel, bounded by levees, supported by soil, and loaded on either side (end piers) by backfill. Soil at the site consists of layered alluvial deposits, comprised primarily of varying amounts of fine sand, silt, and low plasticity, stiff clay (Caltrans). Bedrock is at such a great depth that it is not a consideration for settlement or bearing capacity.

The Project's Study Area is located within the Great Valley geomorphic province, which is underlain by sediments of the Cretaceous, Tertiary, and Quaternary age. The regional site geology consists of Great Valley basin deposits in the California Coastal Range identified as recent Quaternary-age intertidal deposits. Nearest faults to the DCC are the Midland fault zone and the Rio Vista fault to the west and the Foothills fault system to the east (USGS 2021). The Great Valley thrust fault system, including the Trout Creek section and the Gordon Valley section, the Calaveras fault zone, and the San Andreas fault are also regionally relevant faults in the vicinity of the Project.

A total of four soil map units occurs in the study area (Figure 4-1). They are described in the Custom Soil Resource Report for Sacramento, County, California, the State of California (Natural Resources Conservation Service 2021), and summarized in Table 4-1, below.

Figure 4-1. Soil Type Classifications Within the Delta Cross Channel Gate Upgrades Project Study Area

Table 4-1. Soil Map Units in the Study Area

Map Unit Name	Map Unit Reference Code	Drainage Class	Depth to Restrictive Layer	Hydric Soils?
Egbert clay, partially drained, 0 to 2 percent slopes	141	Poorly drained	More than 80 inches	Yes
Laugenour loam, partially drained, 0 to 2 percent slopes	169	Poorly drained	More than 80 inches	Yes
Scribner clay loam, partially drained, 0 to 2 percent slopes, MLRA 16	222	Poorly drained	More than 80 inches	Yes
Valpac loam, partially drained, 0 to 2 percent slopes	230	Somewhat poorly drained	More than 80 inches	Yes
Water	247	N/A	N/A	N/A

Key:
MLRA = major land resource areas
N/A = not applicable

4.1.2 Hydrology and Water Quality

As described previously, the DCC is a controlled diversion channel between the Sacramento River and Snodgrass Slough, located near Walnut Grove. The DCC and DCC gate facility were constructed as initial features of the CVP in 1951. The DCC gate facility has two radial gates that when open, divert up to 3,500 cubic feet per second of flow from the Sacramento River into the Lower Mokelumne River which flows into the central part of the Delta and to the pump facilities of the CVP and SWP.

Reclamation currently operates the DCC gate facility to reduce juvenile salmonid entrainment risk, consistent with Delta water quality requirements in D-1641, and as described in Reclamation's Proposed Project in the Biological Assessment for ROC on LTO (2019) and biological opinions issued to Reclamation (NMFS 2019, USFWS 2019). During the late fall, winter, and spring, the gates are often periodically closed to protect out-migrating salmonids from entering the interior Delta and to facilitate meeting the D-1641 Rio Vista flow objectives for fish passage. In addition, whenever flows in the Sacramento River at Sacramento River reach 20,000 to 25,000 cfs (on a sustained basis), the gates are closed to reduce potential scouring and flooding that might occur in the channels on the downstream side of the gates.

Table 4-2 provides a summary description of Reclamation's operation of the DCC gate facility. From October 1 to November 30, Reclamation typically operates the DCC gates in open position. Catch indices are used by resource managers as indicators of older juvenile Chinook salmon migration into the Delta. If during this period Knights Landing Catch Index or Sacramento Catch Index are greater than three fish per day Reclamation operates the DCC gates in accordance with the action triggers and responses provided in Table 4-2 and water quality targets in Table 4-3 to determine whether to close the DCC gates and for how long.

Table 4-2. Reclamation Operations of Delta Cross Channel Gates During Period October 1 to November 30

Action Trigger	Action Response
Water quality criteria per D-1641 are met and either the KLCI or SCI is greater than 5.0 fish per day	Within 48 hours, close the DCC gates and keep closed until the catch index is less than three fish per day at both the Knights Landing and Sacramento monitoring sites
Water quality criteria per D-1641 are met, either Knights Landing Catch Index or the Sacramento Catch Index are greater than 3.0 fish per day but less than or equal to five fish per day	Within 48 hours of trigger, DCC gates are closed. Gates will remain closed for 3 days
Water quality criteria per D-1641 are met, realtime hydrodynamic and salinity modeling shows water quality concern level targets are not exceeded during 28-day period following DCC closure and there is no observed deterioration of interior Delta water quality	Within 48 hours of start of LMR attraction flow release, close the DCC gates for up to 5 days (dependent upon continuity of favorable water quality conditions)
Water quality criteria per D-1641 are met, real time hydrodynamic and salinity modeling shows water quality concern level targets are exceeded during 14- day period following DCC closure	No closure of DCC gates
The KLCI or SCI triggers are met but water quality criteria are not met per D-1641 criteria.	Monitoring groups review monitoring data and provide to Reclamation. Reclamation and DWR determine what to do with a risk assessment

Key:
D-1641 = State Water Resources Control Board Decision 1641
DCC = Delta Cross Channel
DWR = California Department of Water Resources
KLCI = Knights Landing Catch Index
LMR = Lower Mokelumne River
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
SCI = Sacramento Catch Index

Table 4-3. Water Quality Concern Level Targets for Operation of the Delta Cross Channel Gates

Location for Compliance with Water Quality Level Target	Water Quality Concern Level Targets (Water Quality Model simulated 14- day average Electrical Conductivity) (µmhos/cm)
Jersey Point	1,800
Bethel Island	1,000
Holland Cut	800
Bacon Island	700

Key:
µmhos/cm = micromhos per centimeter

From December 1 to January 31, the DCC gates are closed, except to prevent exceeding a D-1641 water quality threshold. If drought conditions are observed (i.e., fall inflow conditions are less than

90% of historic flows) Reclamation and DWR consider opening the DCC gates for up to 5 days for up to two events to avoid D-1641 water quality exceedances. If this condition occurs, Reclamation and DWR coordinate with USFWS, NMFS, and the State Water Resources Control Board (State Water Board) on how to balance D-1641 water quality and ESA-listed fish requirements. During DCC gates openings between December 1 and January 31, the CVP and SWP will divert at Health and Safety pumping levels.

From February 1 to May 20, the DCC gates are closed consistent with D-1641.

From May 21 to June 15, Reclamation closes the DCC gates for a total of 14 days during this period consistent with D-1641. Reclamation, in coordination with DWR, consider and evaluate real-time hydrologic, hydrodynamic, tidal, and fish data to determine timing and duration of the gate closure.

From June 15 to October 1, the DCC gates are open.

The USGS's California Water Science Center operates flow monitoring stations near the DCC gate facility: Sacramento River above Delta Cross Channel (Station No. 11447890), and Delta Cross Channel near Walnut Grove (Station No. 11336600). These stations, as part of a network of 35 stations located throughout the Delta, as part of a network collecting real-time data used by water project operators, including Reclamation, for understanding how the tidal currents, river inflows, water project exports, temporary barriers, and DCC gate facility operations affect hydrologic and hydrodynamic conditions in Delta waterways (USGS 2016).

Surface water quality conditions near the DCC gate facility are influenced by Reclamation's operation of the gates. As described previously, Reclamation operates the DCC gates in the open position to improve the movement of water from the Sacramento River to the export facilities at the Banks and Jones Pumping Plants, improve water quality in the central and southern Delta, and reduce salinity intrusion rates in the western Delta. Salinity concentrations, in exceedance of water quality targets, initiates gate operations in order to balance constituent levels. Reclamation and DWR work jointly to monitor and avoid water quality supply impacts.

Water quality in the Delta is highly variable and strongly influenced by inflows from the rivers and by estuarine dynamics of the San Francisco Bay-Delta Estuary, particularly during periods of low flow in the Delta or high volumes of water export pumping. Concentrations of water quality constituents in the Delta are affected by agricultural diversions, drainage flows, wastewater discharges, cooling water intakes and discharges, and groundwater accretions.

In addition to flow and water level information collected by USGS at Sacramento River above Delta Cross Channel (Station No. 11447890) and Delta Cross Channel near Walnut Grove (Station No. 11336600), USGS operates a high-frequency water-quality monitoring station at Sacramento River above Delta Cross Channel (Station No. 11447890) and water quality monitoring stations throughout the Delta (USGS 2017). Water quality parameters measures at the site include water temperature, dissolved oxygen, pH, salinity, dissolved organic matter, chlorophyll, turbidity, and nitrate-nitrite (USGS 2021).

Management and regulation of water quality conditions in the Sacramento River and Delta near the Study Area falls within the jurisdiction of the Central Valley CVRWQCB.

Beneficial uses vary throughout the Delta and are evaluated on a case-by-case basis. Beneficial use designations for the Delta include MUN, AGR, process (PROC) Industrial Service Supply (IND), REC-1 (Contact), REC-2, WARM, COLD, MIGR, SPWN (WARM only), WILD, and NAV (Central Valley Regional Water Board 2019). The DCC is located within Central Portion of Delta Waterways as established in Appendix 42 of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan). Clean Water Act Section 303(d) listings for the Central Portion of Delta Waterways are provided in Table 4-4.

Table 4-4. Clean Water Act Section 303(d) List of Water Quality Impairments for Central Portion of Delta Waterways

Pollutant/Stressor	Source
Chlorpyrifos	Agriculture, urban runoff/storm sewers
dichloro-diphenyl-trichloroethane (DDT)	Agriculture
Diazinon	Agriculture, urban runoff/storm sewers
Group A Pesticides	Agriculture
Invasive Species	Source unknown
Mercury	Resource extraction
Unknown Toxicity	Source unknown

Source: Water Board2019 State Water Board 2022

Notes:

Group A pesticides include one or more of the following compounds: aldrin, dieldrin, endrin, chlordane, lindane, heptachlor, heptachlor epoxide, endosulfan, and toxaphene.

4.2 Biotic Habitats

Habitat types in the study area were classified based on descriptions provided in the *California Natural Community List* (CDFW 2021f), which is adapted from the technical approach and vegetation alliance classification system described in *A Manual of California Vegetation* (Sawyer et al. 2009). The vegetated habitat communities present in the study area include, wild oats and annual brome grasslands, Valley oak woodland and forest, Fremont cottonwood forest and woodland, and sandbar willow thickets, along with non-vegetated areas including open water and roads/disturbed (Figure 4-2). A summary of the findings is presented in Table 4-5, and descriptions of the communities are provided below, representative photographs are provided in Attachment B, and a complete list of plant and wildlife species observed are provided in Tables 4-6 and 4-7.

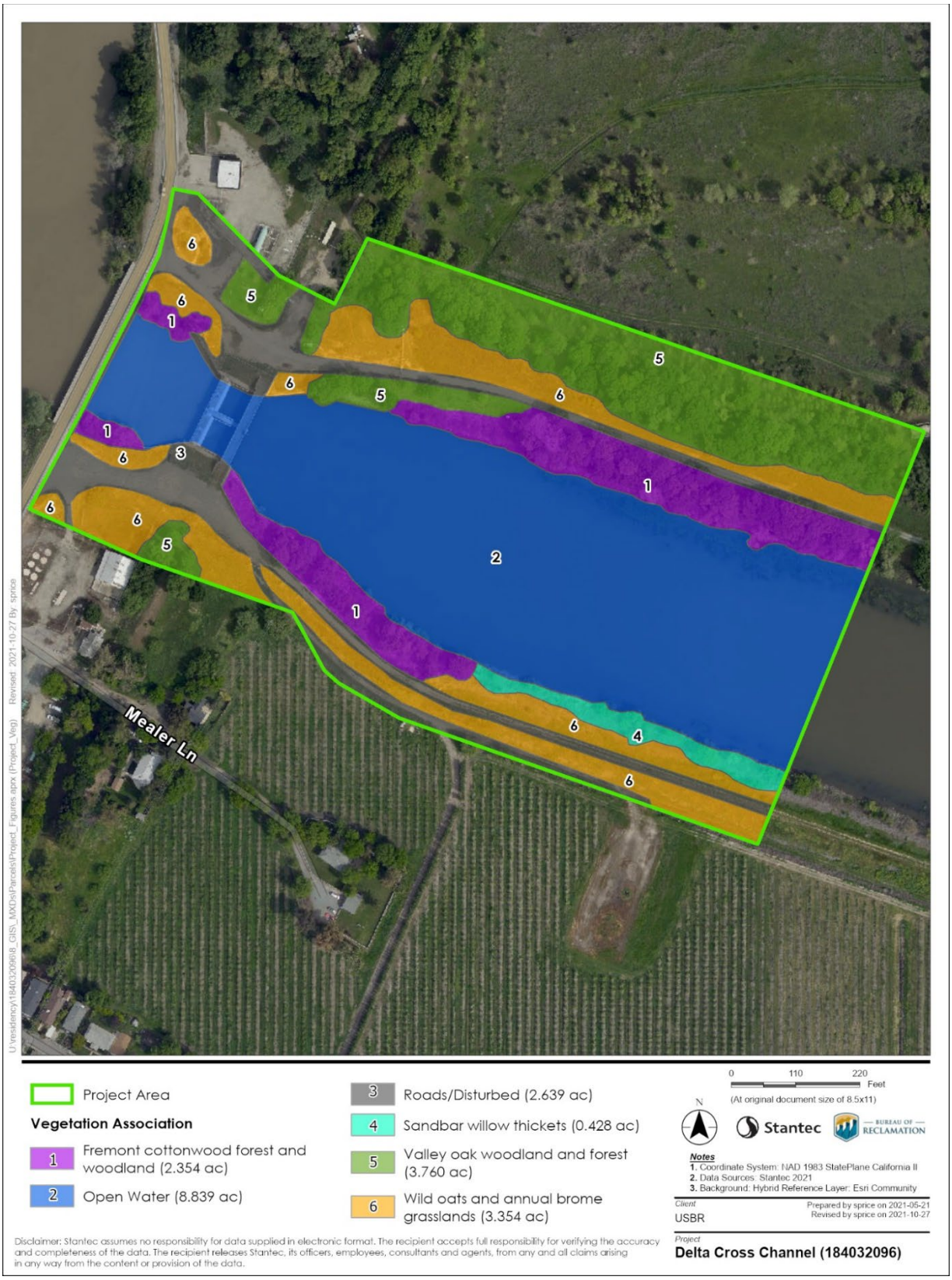


Figure 4-2. Vegetation Communities Within the Delta Cross Channel Gate Upgrades Project Study Area

Table 4-5. MCV Vegetation Communities Within the Study Area

Alliance or Association	Sensitive?	Native?	Acres
Upland			
Avena spp. - *Bromus* spp. Herbaceous Semi-Natural Alliance Wild oats and annual brome grasslands	No	No	3.354
Quercus lobata Forest and Woodland Alliance Valley oak woodland and forest	Yes	Yes	3.760
Subtotal			7.114
Aquatic			
Open Water	No	No	8.839
Populus fremontii Forest and Woodland Association Fremont cottonwood forest and woodland	Yes	Yes	2.354
Salix exigua Shrubland Alliance Sandbar willow thickets	No	Yes	0.428
Subtotal			11.621
Non-Vegetated			
Roads/Disturbed	N/A	N/A	2.639
Subtotal			2.639
Total			21.377

Key:
N/A = not applicable

Table 4-6. Plant Species Observed in the Study Area

Scientific Name	Common Name	Nativity	Family
Acer negundo	Boxelder	Native	Sapindaceae
Ailanthus altissima	Tree of heaven	Invasive	Simaroubaceae
Alnus rhombifolia	White alder	Native	Betulaceae
Amaranthus albus	Tumbleweed	Non-native	Amaranthaceae
Anthriscus caucalis	Bur chevril	Non-native	Apiaceae
Apocynum cannabinum	Indian hemp	Native	Apocynaceae
Aristolochia californica	California pipevine	Native	Aristolochiaceae
Arundo donax	Giant reed	Invasive	Poaceae
Avena spp.	Wild oats	Invasive	Poaceae
Azolla filiculoides	Mosquito fern	Native	Azollaceae
Baccharis pilularis	Coyote brush	Native	Asteraceae
Brassica nigra	Black mustard	Invasive	Brassicaceae
Brassica rapa	Common mustard	Invasive	Brassicaceae
Bromus diandrus	Ripgut brome	Invasive	Poaceae
Bromus hordeaceus	Soft chess	Invasive	Poaceae
Bromus carinatus	California brome	Native	Poaceae
Carex barbarae	Valley sedge	Native	Cyperaceae
Carex comosa	Bristly sedge	Native	Cyperaceae
Centaurea solstitialis	Yellow starthistle	Invasive	Asteraceae
Cephalanthus occidentalis	Common buttonbush	Native	Rubiaceae
Cichorium intybus	Chicory	Non-native	Asteraceae
Cirsium vulgare	Bullthistle	Invasive	Asteraceae
Claytonia perfoliata	Miner's lettuce	Native	Montiaceae
Comarum palustre	Marsh cinquefoil	Native	Rosaceae
Conium maculatum	Poison hemlock	Invasive	Apiaceae
Convolvulus arvensis	Field bindweed	Non-native	Convolvulaceae
Cyperus strigosus	Straw colored cyperus	Native	Cyperaceae
Echinochloa crus-galli	Barnyard grass	Non-native	Poaceae
Eichhornia crassipes	Water hyacinth	Invasive	Pontederiaceae
Eleocharis macrostachya	Spike rush	Native	Cyperaceae
Elymus glaucus	Blue wildrye	Native	Poaceae
Erodium botrys	Broadleaf filaree	Non-native	Geraniaceae
Eschscholzia californica	California poppy	Native	Papaveraceae
Festuca myuros	Rattail sixweeks grass	Invasive	Poaceae
Festuca perennis	Italian rye grass	Invasive	Poaceae
Ficus carica	Common fig	Invasive	Moraceae
Foeniculum vulgare	Fennel	Invasive	Apiaceae
Fraxinus latifolia	Oregon ash	Native	Oleaceae

Table 4-6. Plant Species Observed in the Study Area (contd.)

Scientific Name	Common Name	Nativity	Family
Geranium dissectum	Wild geranium	Invasive	Geraniaceae
Grindelia hirsutula	Gumweed	Native	Asteraceae
Helminthotheca echioides	Bristly ox-tongue	Invasive	Asteraceae
Hordeum brachyantherum	Meadow barley	Native	Poaceae
Hordeum marinum ssp. gussoneanum	Barley	Non-native	Poaceae
Hordeum murinum ssp. leporinum	Farmer's foxtail	Non-native	Poaceae
Juglans hindsii	Northern california black walnut	Native	Juglandaceae
Juglans regia	English walnut	Non-native	Juglandaceae
Juncus bufonius	Common toad rush	Native	Juncaceae
Juncus effusus	Common bog rush	Native	Juncaceae
Lepidium latifolium	Perennial pepperweed	Invasive	Brassicaceae
Leptochloa fusca ssp. fascicularis	Bearded sprangletop	Native	Poaceae
Lotus corniculatus	Bird's foot trefoil	Non-native	Fabaceae
Ludwigia peploides ssp. montevidensis	Floating water primrose	Non-native	Onagraceae
Lysimachia arvensis	Scarlet pimpernel	Non-native	Myrsinaceae
Malva neglecta	Dwarf mallow	Non-native	Malvaceae
Medicago polymorpha	California burclover	Invasive	Fabaceae
Medicago sativa	Alfalfa	Non-native	Fabaceae
Melilotus albus	White sweetclover	Non-native	Fabaceae
Nerium oleander	Oleander	Non-native	Apocynaceae
Paspalum dilatatum	Dallis grass	Non-native	Poaceae
Persicaria hydropiperoides	Water pepper	Native	Polygonaceae
Phalaris aquatica	Harding grass	Invasive	Poaceae
Phalaris minor	Mediterranean canarygrass	Non-native	Poaceae
Phoradendron leucarpum ssp. macrophyllum	Big leaf mistletoe	Native	Viscaceae
Phragmites australis	Common reed	Native	Poaceae
Plantago lanceolata	Ribwort	Invasive	Plantaginaceae
Plantago major	Common plantain	Non-native	Plantaginaceae
Platanus racemosa	California sycamore	Native	Platanaceae
Polygonum aviculare ssp. depressum	Prostrate knotweed	Non-native	Polygonaceae
Polypogon monspeliensis	Annual beard grass	Invasive	Poaceae

Table 4-6. Plant Species Observed in the Study Area (contd.)

Scientific Name	Common Name	Nativity	Family
Populus fremontii	Fremont cottonwood	Native	Salicaceae
Pseudognaphalium canescens	Wright's cudweed	Native	Asteraceae
Pyracantha angustifolia	Firethorn	Invasive	Rosaceae
Quercus agrifolia	Coast live oak	Native	Fagaceae
Quercus lobata	Valley oak	Native	Fagaceae
Raphanus sativus	Jointed charlock	Invasive	Brassicaceae
Robinia pseudoacacia	Black locust	Invasive	Fabaceae
Rosa californica	California wild rose	Native	Rosaceae
Rubus ulmifolius	Elmleaf blackberry	Non-native	Rosaceae
Rubus ursinus	California blackberry	Native	Rosaceae
Rumex crispus	Curly dock	Invasive	Polygonaceae
Rumex pulcher	Fiddleleaf dock	Non-native	Polygonaceae
Salix exigua	Sandbar willow	Native	Salicaceae
Salix gooddingii	Gooding's willow	Native	Salicaceae
Salix laevigata	Polished willow	Native	Salicaceae
Salix lasiandra	Pacific willow	Native	Salicaceae
Salix lasiolepis	Arroyo willow	Native	Salicaceae
Schoenoplectus acutus	Hardstem bulrush	Native	Cyperaceae
Schoenoplectus acutus var. occidentalis	Tule	Native	Cyperaceae
Schoenoplectus californicus	California bulrush	Native	Cyperaceae
Silybum marianum	Milk thistle	Invasive	Asteraceae
Sisymbrium altissimum	Tumble mustard	Non-native	Brassicaceae
Sonchus oleraceus	Sow thistle	Non-native	Asteraceae
Symphyotrichum lentum	Suisun marsh aster	Native	Asteraceae
Taraxacum officinale	Red seeded dandelion	Non-native	Asteraceae
Toxicodendron diversilobum	Poison oak	Native	Anacardiaceae
Trifolium hirtum	Rose clover	Invasive	Fabaceae
Typha latifolia	Broadleaf cattail	Native	Typhaceae
Urtica dioica	Stinging nettle	Native	Urticaceae
Verbena bonariensis	Purple top vervain	Invasive	Verbenaceae
Vicia sativa	Spring vetch	Non-native	Fabaceae
Vicia villosa	Hairy vetch	Non-native	Fabaceae
Vitis californica	California wild grape	Native	Vitaceae

Table 4-7. Wildlife Species Observed in the Study Area

Scientific Name	Common Name
Reptiles	
Actinemys marmorata	western pond turtle
Sceloporus occidentalis occidentalis	northwestern fence lizard
Trachemys scripta elegans	red-eared slider
Birds	
Agelaius phoeniceus	red-winged blackbird
Aix sponsa	wood duck
Anas platyrhynchos	mallard
Antigone canadensis	sandhill crane
Aphelocoma californica	California scrub-jay
Ardea alba	great egret
Ardea herodias	great blue heron
Baeolophus inornatus	oak titmouse
Branta canadensis	Canada goose
Buteo jamaicensis	red-tailed hawk
Buteo swainsoni	Swainson's hawk
Calypte anna	Anna's hummingbird
Cathartes aura	turkey vulture
Circus hudsonius	northern harrier
Colaptes auratus	northern flicker
Contopus sordidulus	western wood-pewee
Corvus corax	common raven
Elanus leucurus	white-tailed kite
Haemorhous mexicanus	house finch
Hirundo rustica	barn swallow
Junco hyemalis	dark-eyed junco
Melanerpes formicivorus	acorn woodpecker
Meleagris gallopavo	wild turkey
Myiarchus cinerascens	ash-throated flycatcher
Nannopterum auritum	double-crested cormorant
Pandion haliaetus	osprey
Pelacanus erythrorhynchos	American white pelican
Petrochelidon pyrrhonota	cliff swallow
Piplio maculatus	spotted towhee
Piranga ludoviciana	western tanager
Sayornis nigricans	black phoebe
Sialia Mexicana	western bluebird
Zenaida macroura	mourning dove
Zonotrichia leucophrys	white crowned sparrow

Table 4-7. Wildlife Species Observed in the Study Area (contd.)

Scientific Name	Common Name
Mammals	
Lontra canadensis	river otter
Odocoileus hemionus ssp. columbianus	Columbian black-tailed deer

4.2.1 Upland Habitat Communities

Wild Oats and Annual Brome Grassland

This native alliance occurs intermittently throughout the study area, along levee edges and in association with upland areas. Within the study area, this alliance is dominated (greater than [>]30 percent [%] relative cover) by non-native grass species wild oats (*Avena* spp.). Other grasses and forbs observed include, soft chess brome (*Bromus hordeaceus*), foxtail barley (*Hordeum murinum*), ripgut brome (*Bromus diandrus*), perennial pepperweed (*Lepidium latifolium*), and prickly oxtongue (*Helminthotheca echioides*) which are present in smaller quantities. CDFW does not consider wild oats and to be a sensitive natural community.

Valley Oak Woodland and Forest

This native alliance occurs intermittently throughout the study area, primarily occurring on the north side of the study area in upland areas. Valley oak (*Quercus lobata*) is dominant with >35% relative cover and in association with other oak species (*Quercus* spp.) as well as Himalayan blackberry (*Rubus armeniacus)* which occurs at lower cover. The herbaceous stratum is typically dominated by non-native grass species such as wild oats and perennial rye grass (*Festuca perennis*). CDFW considers valley oak woodland and forest to be a sensitive natural community.

4.2.2 Wetland Habitat Communities

Fremont Cottonwood Forest and Woodland

This native association occurs in small patches in the study area, along the north and south banks of the DCC on both sides of the canal gate. Fremont cottonwood (*Populus fremontii*) is dominant with >50% relative cover and occurs in association with white alder (*Alnus rhombifolia),* and sandbar willow *(Salix exigua)* at lower cover, in addition to an understory of Himalayan blackberry. CDFW considers Fremont cottonwood forest and woodland to be a sensitive natural community.

Sandbar Willow Thickets

This native alliance occurs in a single stand within the study area, along the south bank of the DCC. These stands are dense, with sandbar willow at nearly 75% relative cover. The herbaceous stratum is sparse and dominated by species such as Baltic rush (*Juncus balticus*) and perennial rye grass. CDFW does not consider sandbar willow thickets a sensitive natural community.

Open Water

Open Water is not a vegetation alliance; but for the purposes of this survey, we have included unvegetated waterbodies within the aquatic habitats category. Within the study area, this includes the water within the DCC on both sides of the canal gate.

4.2.3 Unvegetated Areas

Roads/Disturbed

Roads/disturbed areas are found throughout the study along the tops of the levees as well on both sides of the gate. This includes dirt and gravel roads as well the unvegetated parking areas in the study area.

4.2.4 Habitat Connectivity

Habitat corridors are segments of land that provide linkages between different habitats while also providing cover. On a broader level, corridors also function as avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters and threatened species can be replenished from other areas. Habitat corridors often consist of riparian areas along streams, rivers, or other natural features. Within the study area, the canal itself connects the Sacramento River to Snodgrass Slough and the greater Delta network and provides a habitat corridor for various wildlife species. This includes reptiles, such as the western pond turtle (*Actinemys marmorata*), some aquatic-based mammals such as river otter (*Lontra canadensis*) and North American beaver (*Castor Canadensis*), and waterfowl and shorebird species such as the Northern shoveler (*Spatula clypeata*), American coot (*Fulica americana*), spotted sandpiper (*Actitis macularius*), and killdeer (*Charadrius vociferous*). The narrow strip of riparian habitat along the edge of the DCC provides marginal vegetative cover and a movement corridor for some terrestrial wildlife species as well since it is connected to the denser woodland habitat that occurs just north of the study area. Various types of wildlife could make use of this habitat including common mammals such as racoon (*Procyon lotor*), opossum (*Didelphis virginiana*), and striped skunk (*Mephitis mephitis*), and waterfowl such as wood duck (*Aix sponsa*), and many species of songbirds.

4.2.5 Invasive Species

Invasive plants (i.e., noxious weeds) are undesirable, non-native plants that commonly invade disturbed sites. Most species were introduced from Europe and Asia and are known to degrade native wildlife habitat and plant communities. When disturbance results in the creation of habitat openings or in the loss of intact native vegetation, invasive plants may colonize the site and spread, often out-competing native species. Once established, they are very difficult to eradicate and could pose a threat to native species.

All non-native plant species were reviewed to determine their status as invasive plants according to the ratings in the California Invasive Plant Inventory produced by the California Invasive Plant Council (Cal-IPC) (Cal-IPC 2006, 2021). Cal-IPC categorizes non-native invasive plants into three categories of overall negative ecological impact in California as "high", "moderate", and "limited."

4.2.6 Sensitive Habitats and Natural Communities of Concern

Habitats are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distribution; and/or ;(3) they provide unique habitats (e.g., serpentine soils) for special-status plants or animals species which could occur in the study area.

CDFW Sensitive Natural Communities

CDFW maintains a list of California sensitive natural communities. Sensitive natural communities are classified following the technical approach described in the MCV and the CNPS web-based version of the manual, *A Manual of California Vegetation Online* (CNPS 2021). The MCV describes common to rare vegetation types in California and is the authority on vegetation classification for large- to fine-scale vegetation mapping efforts in the state. The current list of California Sensitive Natural Communities (CDFW 2021f) was reviewed to determine if any sensitive natural communities occur in the study area.

Riparian Habitat

Riparian habitat is considered a sensitive natural community by the USACE, RWQCB, and CDFW, and is present in the study area. In addition to providing habitat for many wildlife species, riparian areas provide shade, sediment, nutrient or chemical regulation, stream bank stability, and input for large woody debris or organic matter to the channel, which are necessary habitat elements for fish and other aquatic species.

Sensitive Aquatic Resources

Wetland and waters features are considered sensitive aquatic resources given they may be regulated under CWA Sections 404 and 401, the Porter-Cologne Act, or California FGC Section 1600 by the USACE, RWQCB, or CDFW, respectively.

4.2.7 Special-Status Species

For the purpose of this evaluation, "special-status" plant species include plants that are: 1) listed as threatened or endangered under the CESA or ESA; 2) proposed for federal listing as threatened or endangered; 3) State or federal candidate species; 4) designated as rare by the CDFW; or 5) have a California Rare Plant Rank (CRPR) of 1A, 1B, 2A, 2B, 3, or 4 species. Special-status animal species include species that are: 1) listed as threatened or endangered under the CESA or ESA; 2) proposed for federal listing as threatened or endangered; 3) state or federal candidate species; or 4) identified by the CDFW as a species of special concern or a fully protected species.

The potential for special-status species to occur within the study area were classified under one of five categories as described below. Only those special-status species with an occurrence potential of "Moderate" or greater are evaluated in detail.

- **Present:** The species was documented in the study area during survey efforts.

- **High:** The species was observed during biological surveys or has been observed and documented within five miles of the study area within the last five years and suitable habitat for the species is present.

- **Moderate:** The project is located within the range of the species, there are documented occurrences within five miles of the study area, and/or potential habitat for the species to exists in the study area.

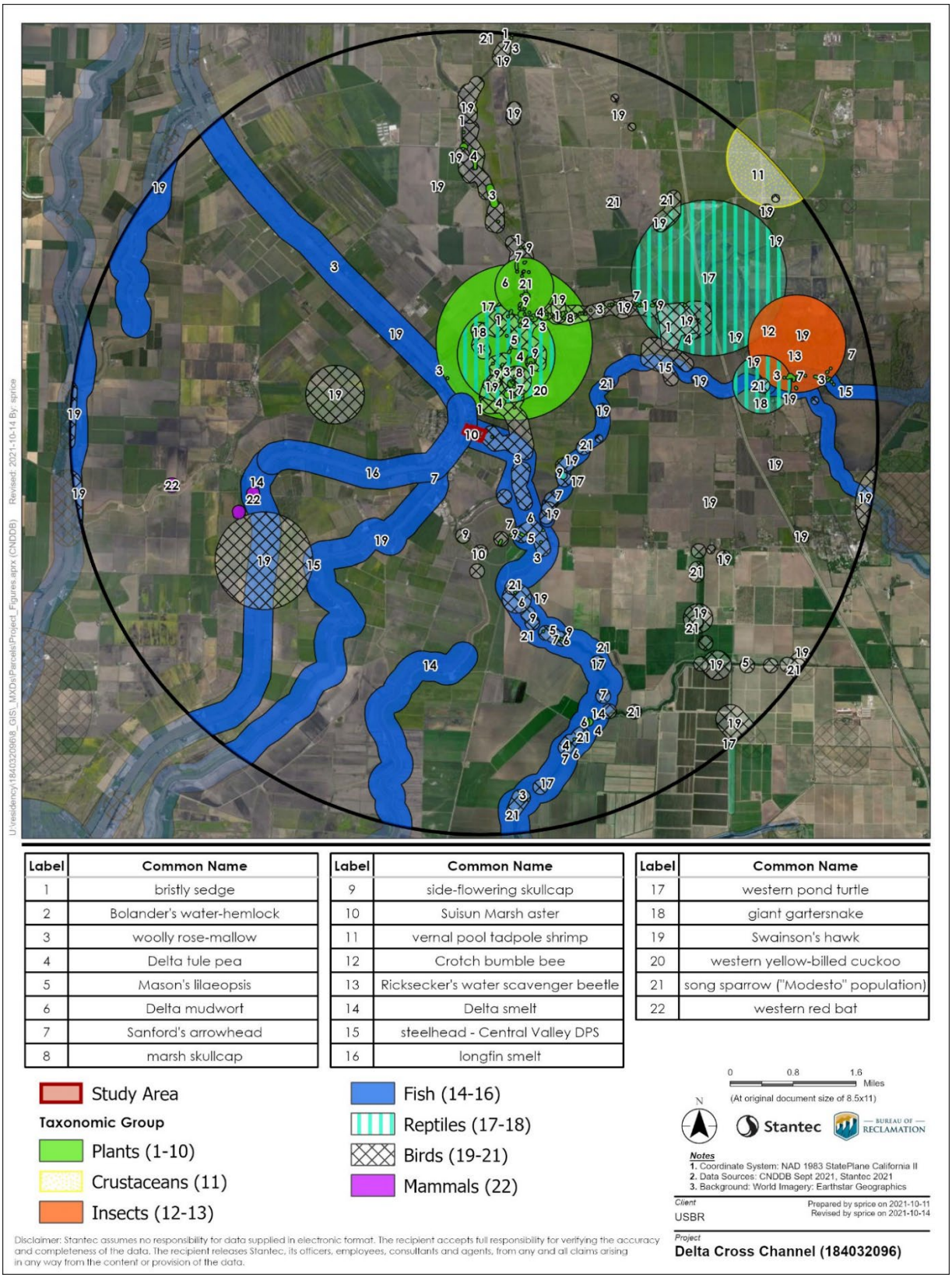
- **Low:** The Project is located within the range of the species and low-quality (e.g., disturbed, agricultural) habitat is present.

- **Absent:** The study area is located outside of the species range and/or potential habitat to support the species is not present in the study area.

- **Not Present:** Potential habitat for the species is present in the study area; however, the species has been determined to be absent from the study area given the results of focused/protocol-level survey(s).

Special-Status Plant Species

Regionally occurring special-status plant species were identified based on a review of pertinent literature, the USFWS species list, CNDDB and CNPS database records, and the field survey results. All CNDDB occurrences located within 5 miles of the study area are depicted in Figure 4-3. The status of each special-status plant species was verified using the *State and Federally Listed Endangered, Threatened and Rare Plants of California* (CDFW 2021d) and *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2021e). For each species, habitat requirements were assessed and compared to the habitats in the study area and immediate vicinity to determine if potential habitat for each species occurs in the study area. For the purposes of this review, all regionally occurring plant species listed under the ESA or CESA are included in Table 4-8, regardless of whether the study area provides potential habitat.



Label	Common Name
1	bristly sedge
2	Bolander's water-hemlock
3	woolly rose-mallow
4	Delta tule pea
5	Mason's lilaeopsis
6	Delta mudwort
7	Sanford's arrowhead
8	marsh skullcap

Label	Common Name
9	side-flowering skullcap
10	Suisun Marsh aster
11	vernal pool tadpole shrimp
12	Crotch bumble bee
13	Ricksecker's water scavenger beetle
14	Delta smelt
15	steelhead - Central Valley DPS
16	longfin smelt

Label	Common Name
17	western pond turtle
18	giant gartersnake
19	Swainson's hawk
20	western yellow-billed cuckoo
21	song sparrow ("Modesto" population)
22	western red bat

Figure 4-3. California Natural Diversity Database Occurrences Within 5 Miles of the Within the Delta Cross Channel Gate Upgrades Project Study Area

Table 4-8. Special-Status Plant Species with Potential to Occur in the Study Area

Common Name Scientific Name	Listing Status[1] (Fed/State/ CRPR)	Known Habitat Requirements and Elevation Range	Bloom Period	Habitat Suitability	Potential for Occurrence
Large-flowered fiddleneck *Amsinckia grandiflora*	E/E/1B.1	Cismontane woodland, and Valley and foothill grassland. Elev. 885-1,805 feet.	(Mar) Apr-May	The study area is outside of the known elevational range of this species. In addition, it is only known to extant occurrences present within Alameda, Contra Costa, and San Joaquin Counties. There are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Mexican mosquito fern *Azolla microphylla*	-/-/4.2	Marshes and swamps (ponds, slow water). Elev. 100-330 feet.	Aug	The study area is outside of the known elevational range of this species. In addition, it is only known to extant occurrences present within Alameda, Contra Costa, and San Joaquin Counties. There are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species
Bristly sedge *Carex comosa*	-/-/2B.1	Coastal prairie, marshes and swamps (lake margins), and vernal pools. Elev. 0-2,050 feet	May-Sep	The study area is within the known range of this plant species and there is potential suitable habitat for this plant species within the study area. There are 11 CNDDB occurrences within 5 miles of the study area.	**Present.** Suitable habitat is present in the study area and the species was observed during the focused botanical surveys.
Pappose tarplant Centromadia *parryi* ssp. *parryi*	-/-/1B.2	Chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, vernally mesic valley and foothill grassland often in alkaline soil. Elev. 0-1,380 feet	May-Nov	The study area is within the known historic range of this plant species, but the specific vernal pool habitat is absent from the study area. In addition, there are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species

Table 4-8. Special-Status Plant Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State/ CRPR)	Known Habitat Requirements and Elevation Range	Bloom Period	Habitat Suitability	Potential for Occurrence
Parry's rough tarplant *Centromadia parryi* ssp. *rudis*	-/-/4.2	Valley and foothill grassland, and vernal pools. Elev. 0-330 feet	May-Oct	The study area is within the known historic range of this plant species, but the specific vernal pool habitat is absent from the study area. In addition, there are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species
Soft-salty bird's-beak *Chloropyron molle* ssp. *molle*	E/-/1B.2	Marshes and swamps (coastal salt). Elev. 0-10 feet	Jun-Nov	The study area is within the known range of this plant species. There is potential suitable habitat for this plant species in the study area. No CNDDB occurrences for this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species
Bolander's water-hemlock *Cicuta maculata var. bolanderi*	-/-/2B.1	Found in marshes and swamps with coastal, fresh, or brackish water. Elev. 0-650 feet	Jul-Sep	The study area is within the known range of this plant species and there is potential suitable habitat for this plant species within the study area. In addition, there is one CNDDB occurrences that overlaps with the northern boundary of study area. No other occurrences occur within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
San Joaquin spearscale *Extriplex joaquinana*	-/-/1B.2	Chenopod scrub, meadows and seeps, playas, and valley and foothill grassland in alkaline soil. Elev. 0-2,740 feet	Apr-Oct	The study area is within the known historic range of this species, but the specific alkali habitats are not present in the study area. In addition, there are no CNDDB occurrences within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species

Table 4-8. Special-Status Plant Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State/ CRPR)	Known Habitat Requirements and Elevation Range	Bloom Period	Habitat Suitability	Potential for Occurrence
Woolly rose-mallow *Hibiscus Lasiocarpos var. occidentalis*	-/-/1B.2	Freshwater marshes and swamps, often in riprap on sides of levees. Elev. 0-395 feet	Jun-Sep	The study area is within the known range of this plant species and there is potential suitable habitat for this plant species within the study area. In addition, there is one CNDDB occurrence that overlaps with the southeastern boundary of the study area, and 10 other occurrences within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Ferris' goldfields *Lasthenia ferrisiae*	-/-/4.2	Vernal pools (alkaline, clay). Elev. 65-2,295 feet	Feb-May	The study area is within the known historic range of this plant species, but no suitable habitat is present in the study area. In addition, there are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species
Delta tule pea *Lathyrus jepsonii var. jepsonii*	-/-/1B.2	Freshwater and brackish marshes and swamps. Elev. 0-15 feet	May-Jul (Aug-Sep)	The study area is within the known range of this plant species and there is potential suitable habitat for this plant species within the study area. In addition, there are six CNDDB occurrences within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Legenere *Legenere limosa*	–/–/1B.1	Deep, seasonally wet habitats such as vernal pools, ditches, marsh edges, and riverbanks. Elev. 0-2,400 feet	Apr-Jun	The study area is within the known historic range of this plant species, but no suitable habitat is present in the study area. In addition, there are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species.

Table 4-8. Special-Status Plant Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State/ CRPR)	Known Habitat Requirements and Elevation Range	Bloom Period	Habitat Suitability	Potential for Occurrence
Heckard's pepper-grass *Lepidium latipes var. heckardii*	-/-/1B.2	Wetlands, valley grassland and wetland riparian. Elev. 3-100 feet	Mar-May	The study area is within the known historic range of this plant species, but the specific alkali grassland habitat is not present in the study area. In addition, there are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species.
Mason's lilaeopsis *Lilaeopsis masonii*	-/R/1B.1	Wetlands, riparian, freshwater marsh, brackish marsh, wetland riparian. Elev. 0-32 feet	Apr-Nov	The study area is within the known range of this plant species and there is potential suitable habitat within the study area. In addition, there are four CNDDB occurrences within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Delta mudwort *Limosella australis*	-/-/2B.1	Riparian scrub, freshwater or brackish marshes and swamps, usually on mud banks. Elev. 0-10 feet	May-Aug	The study area is within the known range of this plant species and there is potential suitable habitat within the study area. In addition, there are six CNDDB occurrences within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Antioch Dunes evening-primrose *Oenothera deltoides ssp. howellii*	E/E/1B.1	Found in inland dunes. Elev. 0-100 feet	Mar-Sep	The study area is within the known historic range of this plant species, but the specific inland dune habitat is not present in the study area. In addition, there are no CNDDB occurrences of this plant species within 5 miles of the study area.	**Absent.** Study area lacks suitable habitat for the species

Table 4-8. Special-Status Plant Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State/ CRPR)	Known Habitat Requirements and Elevation Range	Bloom Period	Habitat Suitability	Potential for Occurrence
Eel-grass pondweed *Potamogeton zosteriformis*	-/-/2B.2	Marshes and swamps (freshwater). Elev. 0-6,105 feet	Jun-Jul	The study area is within the known range of this plant species. There is potential suitable habitat present in the study area. No CNDDB occurrences for this plant species within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Sanford's arrowhead *Sagittaria sanfordii*	-/-/1B.2	Marshes and swamps (shallow freshwater). Elev. 0-2,135 feet	May-Oct (Nov)	The study area is within the known range of this plant species and there is potential suitable habitat for this plant species within the study area. In addition, there are 12 CNDDB occurrences within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Marsh skullcap *Scutellaria galericulata*	-/-/2B.2	Lower montane coniferous forest; meadows and seeps (mesic); and marshes and swamps. Elev. 0-6,890 feet	Jun-Sep	The study area is within the known range of this plant species and there is potential suitable habitat for this plant species within the study area. In addition, there are two CNDDB occurrences of this plant species within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.
Side-flowering skullcap *Scutellaria lateriflora*	-/-/2B.2	Meadows and seeps (mesic); marshes and swamps. Elev. 0-1,640 feet	Jul-Sep	The study area is within the known range of this plant species and there is potential suitable habitat within the study area. In addition, there are 10 CNDDB occurrences within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.

Table 4-8. Special-Status Plant Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State/ CRPR)	Known Habitat Requirements and Elevation Range	Bloom Period	Habitat Suitability	Potential for Occurrence
Suisun Marsh aster *Symphyotrichum lentum*	-/-/1B.2	Brackish and freshwater marshes and swamps. Elev. 0-10 feet	(Apr) May-Nov	The study area is within the known range of this plant species and there is potential suitable habitat for this plant species within the study area. In addition, there is one CNDDB occurrence that occurs in the southwestern portion of the study area, with two other occurrences located within 5 miles of the study area.	**Present.** Suitable habitat is present in the study area and the species was observed during the focused botanical surveys.
Saline clover *Trifolium hydrophilum*	-/-/1B.2	Marshes and swamps, valley, and foothill grassland in mesic areas with alkaline soil, vernal pools. Elev. 0-985 feet	Apr-Jun	The study area is within the known range of this plant species. There is potential suitable habitat for this plant species. No CNDDB occurrences are located within 5 miles of the study area.	**Not Present.** Although suitable habitat is present in the study area, the species was not observed during the focused botanical surveys.

Notes:

[1]**Federal and State Status Codes:** E = Endangered; T= Threatened; R = Rare

CNPS CRPR Codes:

List 1B Plants rare, threatened, or endangered in California and elsewhere.

List 2 Plants rare, threatened, or endangered in California but more common elsewhere.

List 4. Plants of limited distribution. Extensions: x.1 - Seriously threatened in California; x.2 – Moderately threatened in California; x.3 -Not very threatened in California.

Key:

CNDDB = California Natural Diversity Database

Special-Status Animal Species

Regionally occurring special-status animal species were identified based on a review of pertinent literature, the USFWS species list, CNDDB database records, a query of the California Wildlife Habitat Relationships System (CDFW 2014), and the reconnaissance-level biological field survey results. CNNDB special-status animal species occurrences within five miles of the study area are illustrated in Figure 4-3. For each species, habitat requirements were assessed and compared to the habitats in the study area and immediate vicinity to determine the species' potential to occur in or near the study area. For the purposes of this review, all regionally occurring wildlife species listed under the ESA or CESA are included in Table 4-9, regardless of whether the study area provides potential habitat.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Invertebrates			
Crotch bumble bee *Bombus crotchii*	–/CE	Open grasslands and scrub areas in hot and dry climates. Requires underground nesting habitat, abundant flowering plants for foraging, and overwintering habitat (soft, disturbed soil or leaf litter). Crotch bumble bee has been nearly extirpated from the Central Valley.	**Moderate.** The study area is within the known range of this species. There is moderate quality habitat in the grassland habitat in the study area. One CNDDB occurrence is present within 5 miles of the study area.
Conservancy fairy shrimp *Branchinecta conservatio*	T/–	Vernal pools, swales, and ponded ephemeral freshwater habitats, often larger, turbid playa pools.	**Absent.** No suitable vernal pool habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE/–	Typical habitat is coastal grassland and low scrub of north-facing slopes within the fog belt where the larval host plant grows. All known locations are restricted to San Mateo County, California, where several populations are known from San Bruno Mountain, Milagra Ridge, the San Francisco Peninsula Watershed, and Montara Mountain	**Absent**. The study area is outside of the known range for this species. There are no known CNDDB occurrences within 5 miles of the study area.
Vernal pool fairy shrimp *Branchinecta lynchi*	T/–	Vernal pools, swales, ephemeral freshwater habitats, often grass or mud-bottomed swales, earth slump or basalt-flow depression pools in grasslands.	**Absent.** No suitable habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Vernal pool tadpole shrimp *Lepidurus packardi*	E/–	Vernal pools, swales, and ponded ephemeral freshwater habitats.	**Absent.** No suitable habitat is present within the study area. One CNDDB occurrence is present within 5 miles of the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T/–	Elderberry shrubs having stems with a basal diameter equal to or greater than 1 inch. Typically associated with riparian habitat.	**Absent.** No suitable habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Delta green ground beetle Elaphrus viridis	T/–	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base.	**Absent.** No suitable habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Amphibians			
California tiger salamander *Ambystoma californiense*	T/T	Requires seasonally inundated wetland/vernal pools and other ponded habitats for breeding with associated upland terrestrial habitat. Utilizes small mammal burrows within upland habitat.	**Absent.** No suitable habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Foothill yellow-legged frog *Rana boylii*	–/CT	Inhabits partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs cobble-sized substrate for egg-laying and at least 15 weeks of water to attain metamorphosis.	**Absent.** No suitable habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.
California red-legged frog *Rana draytonii*	T/SSC	Requires perennial or near-perennial aquatic habitats, especially for breeding; often slow-moving streams, freshwater pools, and ponds over 1-foot deep, often with overhanging vegetation; adjacent upland habitats are often used for temporary refuges or dispersal movements.	**Absent.** No suitable habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Fish			
Green sturgeon *Acipenser medirostris* *Critical Habitat*	T/SSC	Prefers deep, low gradient reaches (> 5 m) or off-channel coves.	**High.** Known to migrate and rear throughout the Delta and the study area is within its designated critical habitat.
White sturgeon *Acipenser transmontanus*	—/SSC	White sturgeon primarily live in estuaries of large rivers but migrate to spawn in fresh water and often make long ocean movements between river systems. White sturgeon primarily occur in the Sacramento River, Feather, and San Joaquin Rivers.	**High**. Known to migrate and rear throughout the Delta system
Pacific lamprey *Entosphenus tridentatus*	—/SSC	Cool streams that reach the ocean and that have shallow, partly shaded pools and clear-water depression pools. In the Central Valley, their upstream range appears to be limited by impassable dams that exist on all large rivers.	**High.** Known to migrate through the Delta, lower Sacramento, and Mokelumne River systems.
River lamprey *Lampetra ayresii*	—/SSC	Cool streams that reach the ocean and that have shallow, partly shaded pools, and clear-water depression pools. In the Central Valley, their upstream range appears to be limited by impassable dams that exist on all large rivers.	**Moderate**. Known to migrate through the Delta.
California Central Valley Steelhead - *Oncorhynchus mykiss* *Critical Habitat*	T/—	Spawns in cool, moderately fast flowing water with gravel bottom.	**High**. Known to migrate through the Delta and Sacramento systems and the study area is within designated critical habitat for this species.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Sacramento River Winter-run Chinook salmon *Oncorhynchus tshawytscha Critical Habitat*	E/E	Spawn and rear in main-stem Sacramento River. Require cool year-round water temperatures, since spawning occurs during the summer. Requires deep pools and riffles, and clean gravel and cobble substrate to spawn.	**High**. Known to migrate through the Delta and Sacramento systems and the study area is within designated critical habitat for this species.
Central Valley Spring-run Chinook salmon *Oncorhynchus tshawytscha Critical Habitat*	T/T	Cool streams that reach the ocean and that have shallow, partly shaded pools and clear-water depression pools.	**High**. Known to migrate through the Delta and Sacramento systems and the study area is within designated critical habitat for this species.
Central Valley fall/late fall-run Chinook salmon *Oncorhynchus tshawytscha*	—/SSC	Spawn and rear in main-stem Sacramento River. Require cool year-round water temperatures, since spawning occurs during the summer. Requires deep pools and riffles, and clean gravel and cobble substrate to spawn.	**High**. Known to migrate through the Delta, lower Sacramento, and Mokelumne River systems.
Delta smelt *Hypomesus transpacificus Critical Habitat*	T/E	Inhabit the Sacramento-San Joaquin Delta estuary in open, shallow, low-salinity (<10%) waters. Spawns in middle and upper reaches of Delta from late winter to spring.	**High**. Known to occur throughout the Delta and lower Sacramento River and the study area is within designated critical habitat for this species.
Longfin smelt *Spirinchus thaleichthys*	C/T	Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt but can be found in completely freshwater to almost pure seawater.	**Moderate**. Known to occur in the lower reaches of the Delta and periodically in the upper reaches of the Delta and lower Sacramento.
Sacramento hitch *Lavinia exilicauda exilicauda*	—/SSC	Inhabit warm, lowland, waters including clear streams, turbid sloughs, lakes and reservoirs.	**Low**. Suitable habitat is present, but preferred habitat occurs upstream from the Delta.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Hardhead *Mylopharodon conocephalus*	—/SSC	Inhabit warm, lowland, waters including clear streams, turbid sloughs, lakes and reservoirs.	**Low**. Preferred habitat occurs upstream from the Delta.
Sacramento splittail *Pogonichthys macrolepidotus*	—/SSC	Splittail depend both on brackish-water rearing habitats in the San Francisco Estuary and on floodplain and river-edge spawning habitats immediately above the estuary.	**High**. Known to occur throughout the Delta and lower Sacramento.
Reptiles			
Northern California legless lizard *Anniella pulchra*	–/SSC	Found in variety of habitats and most common in the Coast Ranges. Occurs in coastal scrub, coastal dunes, valley and foothill grasslands, and chapparal habitats.	**Absent**. The study area is outside of the known range for this species.
Western pond turtle *Emys marmorata*	–/SSC	Slow water aquatic habitat with available basking sites. Hatchlings require shallow water with dense submergent or short emergent vegetation. Require an upland oviposition site near the aquatic site.	**Present.** Suitable aquatic habitat is present within the DCC, but upland habitat for nesting is marginal. Species observed in the study area during surveys.
Giant garter snake *Thamnophis gigas*	T/T	Freshwater marshes and low gradient streams with emergent vegetation; adapted to drainage canals and irrigation ditches with mud substrate.	**Low.** Marginally suitable upland and overwintering habitat for this species is present in the study area. There are 2 documented CNDDB occurrences within 5 miles of the study area; the closest is located approximately 2.9 miles north from the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Birds			
Tricolored blackbird *Agelaius tricolor*	–/T, SSC	Breeds near fresh water in dense emergent vegetation. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	**Absent.** Suitable foraging habitat is present, but no suitable dense emergent nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Grasshopper sparrow *Ammodramus savannarum*	–/SSC	Native grasslands with a mix of grasses, forbs and scattered shrubs. Lowland plains, in valleys and on hillsides on lower mountain slopes.	**Moderate.** Potentially suitable habitat for this species is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Lesser sandhill crane *Antigone canadensis canadensis*	–/SSC	Wetlands required for breeding; forage in nearby pastures, fields, and meadows.	**Low.** No suitable breeding habitat is present and low quality suitable foraging habitat present in the limited grassland habitat in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Greater sandhill crane *Antigone canadensis tabida*	--/T, FP	Wetlands required for breeding; forage in nearby pastures, fields, and meadows.	**Low.** No suitable breeding habitat is present and marginally suitable foraging habitat present in the limited grassland habitat in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Golden eagle *Aquila chrysaetos*	—/FP	Nests on cliffs or in large trees or electrical towers, forages in open areas.	**Low.** No suitable nesting habitat is present and marginally suitable foraging habitat present in the limited grassland habitat in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Short-eared owl *Asio flammeus*	—/SSC	Nests in dense vegetation in prairies, marshes, dunes, and tundra.	**Absent.** No suitable nesting or foraging habitat present in study area. There are no known CNDDB occurrence within 5 miles from the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Long-eared owl *Asio otus*	—/SSC	Dense riparian and live oak thickets near meadow edges, and nearby woodland and forest habitats; also found in dense conifer stands at higher elevations.	**Moderate.** The study area is located on the edge of this species range. Potentially suitable nesting and foraging habitat for this species is present. There are no known CNDDB occurrences within 5 miles of the study area.
Western burrowing owl *Athene cunicularia*	–/SSC	Grasslands and ruderal habitats. Uses mammal burrows or other suitable underground cavities.	**Absent**. No suitable nesting or foraging habitat present in the study area for the species. There are no known CNDDB occurrences within 5 miles of the study area.
Redhead *Aythya americana*	—/SSC	Nest in freshwater emergent wetlands where dense stands of cattails and tules are interspersed with areas of deep, open water.	**Absent**. No suitable nesting habitat is present in the study area for this species. There are no known CNDDB occurrences within 5 miles of the study area.
Swainson's hawk *Buteo swainsoni*	–/T	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah; forages in adjacent livestock pasture, grassland, or grain.	**Moderate.** Species documented during focused survey efforts near the study area; however, only marginal/low quality suitable nesting and foraging habitat is present in the study area itself. There are 38 known CNDDB occurrences within 5 miles of the study area.
Vaux's swift *Chaetura vauxi*	—/SSC	Nests in snags in coastal coniferous forests or, occasionally, in chimneys; forages aerially.	**Absen**t. The study area is outside of the known range for this species.
Mountain plover *Charadrius montanus*	—/SSC	Found in open grasslands and plowed fields with sparse vegetation and open sagebrush.	**Absent**. No suitable nesting habitat is present in the study area for this species. There are no known CNDDB occurrences within 5 miles of the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Northern harrier *Circus hudsonius*	—/SSC	Forages in marshes, grasslands, and ruderal habitats; nests in extensive marshes and wet fields.	**Moderate.** Marginally suitable foraging habitat present and nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	T/E	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	**Absent.** Suitably dense riparian habitat is absent from the study area. There is one known CNDDB occurrence within 5 miles of the study area; located approximately 1 mile north in riparian habitat along Snodgrass Slough.
Yellow warbler *Dendroica petechia*	--/SSC	Nests in riparian woodlands, particularly those dominated by willows and cottonwoods.	**Moderate.** Suitable foraging and nesting habitat present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
White-tailed kite *Elanus leucurus*	–/FP	Nests in tall shrubs and trees, forages in grasslands, agricultural fields and marshes.	**High.** Suitable nesting habitat and marginally suitable foraging habitat present in the study area. There are no known CNDDB occurrences within 5 miles of the study area, but species was observed foraging over study area during wildlife surveys.
American peregrine falcon *Falco peregrinus anatum*	–/FP	Forages in many habitats; requires cliffs for nesting.	**Absent.** No suitable nesting habitat is present in the study area for this species. There are no known CNDDB occurrences within 5 miles of the study area.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	–/FP	Found in freshwater and saltwater marshes and swamps. Typically nests in wetland vegetation but has been known to nest in drier environments.	**Absent**. No suitable nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Bald eagle *Haliaeetus leucocephalus*	D/E, FP	Requires large bodies of water, or free-flowing rivers with abundant fish and adjacent snags and large trees for perching and nesting.	**Low.** Suitable nesting habitat is absent and marginally suitable foraging habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Yellow-breasted chat *Icteria virens*	–/SSC	Breeds in riparian habitats having dense understory vegetation, such as willow and blackberry.	**Moderate.** Suitable foraging and nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Western least bittern *Ixobrychus exilis*	–/SSC	Colonial nester in marshlands and borders of ponds and reservoirs which provide ample cover. Nests usually placed low in tules, over water.	**Absent**. No suitable nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
California black rail *Laterallus jamaicensis coturniculus*	–/T	Freshwater marshes, wet meadows and shallow margins of saltwater marshes boarding larger bays. Requires dense vegetation for nesting habitat.	**Absent.** The study area is outside of the known range for this species.
Modesto song sparrow *Melospiza melodia*	-/SSC	Prefers riparian, fresh or saline emergent wetland, and wet meadow habitats. Breeds in riparian thickets of willows, other shrubs, vines, tall herbs, and in fresh or saline emergent vegetation.	**High.** Suitable nesting and foraging habitat are present in the study area. There are 16 documented CNDDB occurrences of this species within 5 miles of the study area; the closest occurrence is located 1.5 mile east.
Suisun song sparrow *Melospiza melodia maxillaris*	–/SSC	Found in marsh habitats throughout Suisun Bay and requires dense vegetation for nesting.	**Absent.** The study area is outside of the known range for this species.
American white pelican *Pelecanus erythrorhynchos*	–/SSC	Nests on small islands or remote dikes, flat or gently sloping and lacking shrubs or other obstructions, in large freshwater or saltwater lakes.	**Low.** Suitable nesting habitat is absent and marginally suitable foraging habitat present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Purple martin *Progne subis*	–/SSC	Breeding habitat includes old-growth, multi-layered, open forest and woodland with snags; forages over riparian areas, forest, and woodlands.	**Absent**. No suitable nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
California Ridgway's rail *Rallus obsoletus obsoletus*	E/E, FP	Locally common yearlong in coastal wetlands and brackish areas around San Francisco, Monterey, and Morro bays.	**Absent.** The study area is outside of the known range for this species.
Bank swallow *Riparia riparia*	–/T	Found in riparian areas with cliffs and banks with friable soils suitable for cavity nesting.	**Absent**. No suitable nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Yellow headed blackbird *Xanthocephalus xanthocephalus*	–/SSC	Nests in wetlands with dense vegetation and deep water.	**Absent**. No suitable nesting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Mammals			
Pallid bat *Antrozous pallidus*	--/SSC	Found in desert, grassland, shrublands, woodland and forest habitats. Roost in caves, crevices, mine shafts, under bridges, in hollow trees, and buildings.	**Absent**. No suitable roosting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Townsend's big-eared bat *Corynorhinus townsendii*	-/SSC	Found in wide variety of habitats including conifer and deciduous woodlands, chaparral, chenopod scrub, and grasslands. Most common near mesic sites. Roost in man-made structures such as old buildings and bridge crevices.	**Absent**. No suitable roosting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Western mastiff bat *Eumops perotis californicus*	--SSC	Found in various open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roost between rock slabs of vertical cliffs and rugged canyons.	**Absent**. No suitable roosting habitat is present in the study area. There are no known CNDDB occurrences within 5 miles of the study area.

Table 4-9. Special-Status Animal Species with Potential to Occur in the Study Area (contd.)

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Western red bat *Lasiurus blossevillii*	-/SSC	Prefers sites with a mosaic of habitats that includes trees for roosting and open areas for foraging. Strongly associated with riparian habitats.	**Moderate.** Potentially suitable habitat for this species is present. There are two CNDDB occurrences within 5 miles of the study area; the nearest occurrence is approximately 3.3 miles southwest.
Suisun shrew *Sorex ornatus sinuosus*	-/SSC	Found in tidal marshes of the northern shores of San Pablo and Suisun bays. Requires dense low-lying cover and driftweed and other litter above the mean high tide line for nesting and foraging.	**Absent**. No suitable habitat is present within the study area. There are no known CNDDB occurrences within 5 miles of the study area.
Riparian brush rabbit *Sylvilagus bachmani riparius*	E/E	Inhabits riparian forest and prefers dense thickets of wild rose, willows, and blackberries. Remaining extant population are only found along the Stanislaus River in Caswell Memorial State Park, San Joaquin County, California. No other sightings of riparian brush rabbits outside the park have been reported in over 40 years.	**Absent.** The study area is outside of the known remaining populations for this species.

Notes:

[1] **Federal and State Status Codes:** E = Endangered; T = Threatened; CT= Candidate Threatened; CE= Candidate Endangered; FP = Fully Protected; SSC= Species of Special Concern, D = Delisted

Key:

CNDDB = California Natural Diversity Database

Chapter 5 Results: Biological Resources Survey Findings

5.1 Sensitive Habitats and Natural Communities of Concern

5.1.1 Sensitive Natural Communities

Two sensitive natural communities of special concern were documented in the study area during the botanical and vegetative community assessment field survey, Valley oak woodland and Fremont cottonwood forest, which cover a total of 3.760 acres and 2.354 acres, respectively.

Riparian Habitat

Riparian habitat is present within the study area and includes Fremont cottonwood forest and woodland, Valley oak forest and woodland, and sandbar willow thickets, which occur along the northern and southern banks of the DCC and totals 6.542 acres.

Sensitive Aquatic Resources

The delineation of aquatic resources within the study area identified a total of approximately 9.4 acres of wetlands and waters consisting of approximately 0.3 acres of riparian wetland and 9.1 acres of perennial stream (i.e., DCC), respectively (see Figure 5-1) (Stantec 2023). These features are considered sensitive aquatic resources given they may be regulated under CWA Sections 404 and 401, the Porter-Cologne Act, or Fish and Game Code Section 1600 by the USACE, RWQCB, or CDFW, respectively.

Figure 5-1. Aquatic Resources Within the Delta Cross Channel Gate Upgrades Project Study Area

5.2 Invasive Species

In total, 29 invasive species with a Cal-IPC rating of "high" that were observed in the study area, including species such as perennial pepperweed (*Lepidium latifolium*), yellow starthistle (*Centaurea solstitialis*), fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), and tree-of-heaven (*Ailanthus altissima).* For a complete list of invasive species observed, see Table 4-6.

5.3 Special-Status Plant Species Summary

Two special-status plant species, bristly sedge (*Carex comosa*) and Suisun marsh aster (*Symphyotrichum lentum*), were documented in the study area and during the focused botanical surveys. These two species are further described in the text below. Ten other special-status plant species were found to have suitable habitat in the study area but were determined not to occur in the study area as they were not identified during the focused botanical surveys. These 10 species are not addressed further in this report.

5.3.1 Special-Status Plant Discussions

Bristly Sedge

Distribution, Biology, and Habitat Requirements

Bristly sedge is a CRPR 2B.1 species. The species is an herbaceous perennial rhizomatous herb in the sedge family (*Cyperaceae*), that grows in wet habitats such as coastal prairie, marshes, swamps, lake margins, and valley and foothill grassland. In California it only occurs in various counties primarily within the Bay-Delta region, but also in Shasta County, Fresno County, and San Bernadino County. Bristly sedge generally blooms from May to September and occurs at elevations between 0 and 2,050 feet.

Occurrence Records

There are 11 CNDDB occurrences of bristly sedge within 5 miles of the study area. The closest occurrence is dated 2009 and is located approximately 0.22-miles northeast of the study area in the Delta Meadows River Park (CDFW 2021a).

Suitable Habitat Within the Study Area

Within the study area, the shallow edges of the DCC and the pockets of marshy habitat within the Fremont cottonwood forest and sandbar willow thicket vegetation associations provide suitable habitat for this species. The botanical surveys that were completed on May 19 and August 11, 2021, identified this species growing in one location on the south side of the DCC located within Fremont cottonwood forest habitat (Figure 5-2).

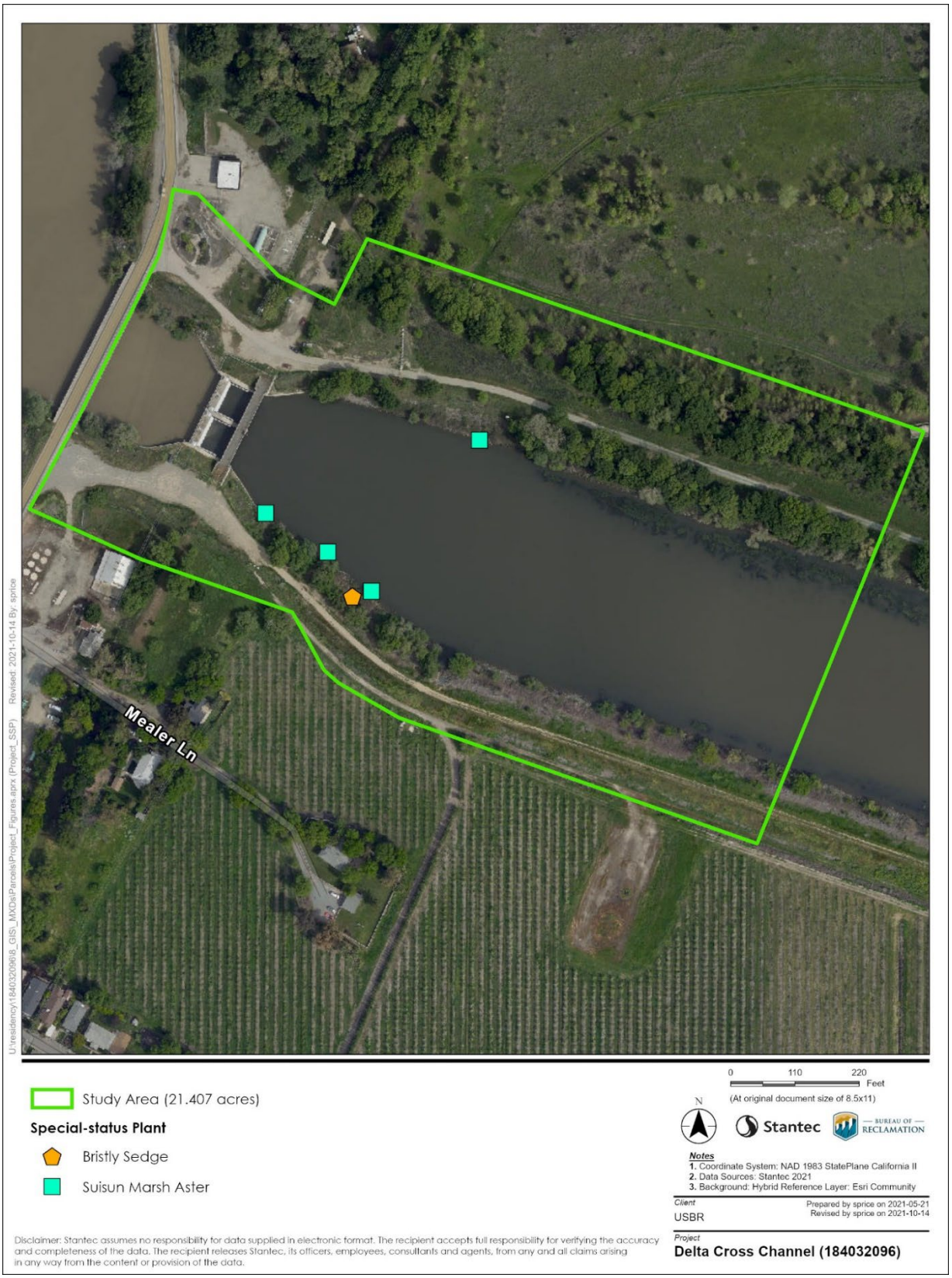


Figure 5-2. Special-status Plant Species Within the Delta Cross Channel Gate Upgrades Project Study Area

Suisun Marsh Aster

Distribution, Biology, and Habitat Requirements

Suisun Marsh aster is a CRPR 1B.2 species. The species is a perennial rhizomatous herb in the daisy family (*Asteraceae*), that grows in marshes and swamps, within both brackish and freshwater conditions (CNPS 2021). In California it is known to occur in portions of the Central Valley and the Sacramento-San Joaquin Valley regions. Suisun Marsh aster generally blooms from (April) May through November and occurs at elevations between 0 and 10 feet.

Occurrence Records

There are two CNDDB occurrence of Suisun Marsh aster within 5 miles of the study area. The closest occurrence is most recently dated from 2009 and is located approximately 0.50 miles north-northwest of the study area located in the Delta Meadows River Park (CDFW 2021).

Suitable Habitat Within the Study Area

Within the study area, the shallow edges of the DCC and the pockets of marshy habitat within the Fremont cottonwood forest and sandbar willow thicket vegetation associations provide suitable habitat for this species. The botanical surveys that were completed on May 19 and August 11, 2021, identified this species growing in three locations on the south side of the DCC. All of these locations were associated with the Fremont cottonwood forest habitat (Figure 5-2).

5.4 Special-Status Animal Species Summary

Special-status animal species results are based on a desktop review of available literature and databases, including CNDDB occurrence data (for non-fish species). Survey results and data from the aquatic resources delineation, terrestrial vegetation communities mapping, botanical surveys, and the general and focused wildlife surveys were used to further inform the potential for the "other special-status" species to occur.

A total of 20 special-status wildlife species were determined to have moderate or high potential to occur in or near the study area (Table 4-9) and are discussed below in detail. Giant garter snake, which has a low potential to occur, is also discussed below given the potential for the species to disperse into the study area and that the species is listed under ESA and CESA. The focused survey results for valley elderberry longhorn beetle and western burrowing owl concluded that suitable habitat to support the species is absent from the study area and their respective survey boundaries (i.e., approximately 165-foot survey buffer for valley elderberry longhorn beetle and a 500-foot buffer for western burrowing owl); and as such, the species are not evaluated further in this report.

5.4.1 Special-Status Insects

Crotch Bumble Bee

Distribution, Biology, and Habitat Requirements

The Crotch bumble bee (*Bombus crotchii*) is a CESA candidate endangered species. Crotch bumble bee is easily distinguished from other species in the Apidae family based on hair coloration. The size of Crotch bumble bees varies, with queens ranging from approximately 0.9 to 1 inch in length (The

Xerces Society for Invertebrate Conservation 2018). Workers range from approximately 0.5 to 0.8 inches, and males range from 0.6 to 0.7 inches in length (The Xerces Society for Invertebrate Conservation et al. 2018). Historically, Crotch bumble bees were common throughout most of the southern two-thirds of California, northern Mexico, and southwest Nevada. Currently, this species occurs in limited populations along the California coast, deserts, Central Valley, and adjacent foothills through most of southwestern California (The Xerces Society for Invertebrate Conservation et al. 2018). The decline of the Crotch bumble bees is attributed to the modification and destruction of habitat (especially in the Central Valley due to extensive agriculture), overexploitation, competition with managed honeybees, and disease.

Crotch bumble bees inhabit open grasslands and scrub habitats for both foraging and nesting habitat. They primarily nest underground in ground squirrel or other animal burrows. Crotch bumble bees visit a large variety of flowering plants to forage for nectar. Plant families most associated with this species include *Fabaceae*, *Apocynaceae*, *Asteraceae*, *Lamiaceae*, and *Boraginacea* (The Xerces Society for Invertebrate Conservation 2018). These plant families are not particularly this species preference; however, they represent the majority of flowers in the landscapes where this species occurs. Very little is known about overwintering sites, but studies show that they overwinter in soft, disturbed soils or under leaf litter (The Xerces Society for Invertebrate Conservation 2018).

Occurrence Records
There is one CNDDB occurrence of Crotch bumblebee within 5 miles of the study area. The closest occurrence is most recently dated from 2020 and is located approximately 3.77 miles northeast of the study area located in the Cosumnes River Preserve (CDFW 2021a).

Suitable Habitat Within the Study Area
Within the study area, the annual grasslands provide marginally suitable habitat for the Crotch bumble bee. This species was not observed in the study area during the field survey efforts.

5.4.2 Special-Status Fish

Green Sturgeon

Distribution, Biology, and Habitat Requirements
The Southern Distinct Population Segment of North American Green sturgeon (*Acipenser medirostris*) are an ESA threatened species and a CDFW species of special concern. Green sturgeon anadromous fish native to the California Central Valley. Like other anadromous fishes, green sturgeon use freshwater rivers for spawning and juvenile rearing but spend most of their lives in marine waters and regularly make large-scale migrations along the coasts of California, Oregon, and Washington. A long-lived species, sexual maturity is not achieved until 15 to 17 years of age, and spawning migrations occur every 3.75 years on average after that time (NMFS 2016). Spawning occurs upstream in the Sacramento River and some of its tributaries.

Within estuaries, green sturgeon reportedly tend to concentrate in deep areas with soft bottoms. In rivers, adult (and juvenile) green sturgeon have been observed primarily on clean sand (Environmental Protection Information Center et al. 2001). Adult green sturgeon are benthic, usually found in the Sacramento River in deep, off-channel areas with little current. Adults and

juveniles are opportunistic carnivores, feeding on benthic invertebrates and may also take small fish (Adams et al. 2002). Adult green sturgeon are also known to feed on worms, clams, sand lances, callianassid shrimp, crabs, isopods, and anchovies (Environmental Protection Information Center et al. 2001, Moyle 2002).

Juvenile green sturgeon reportedly occur in shallow water (Radtke 1966) and probably move to deeper, more saline areas as they grow (Environmental Protection Information Center et al. 2001). Rearing juveniles remain in freshwater for one to four years before returning to their marine environment (Beamesderfer and Webb 2002, Environmental Protection Information Center et al. 2001). Juveniles in the Delta primarily feed on opossum shrimp and amphipods (Radtke 1966, Moyle 2002). The growth rate for green sturgeon juveniles is roughly 3 inches per year until they reach maturity at 4 to 5 feet in length, around age 15 to 20, at which time the growth rate slows (Wang 1986).

Suitable Habitat Within the Study Area
The lower Sacramento River and Delta, including around the DCC in the study area, functions as year-round rearing habitat and as a migration corridor.

White Sturgeon

Distribution, Biology, and Habitat Requirements
White sturgeon (*Acpenser transmontanus*) are a CDFW species of special concern. Historically the species populations ranged from Alaska to central California (Moyle 2002); however, major spawning populations are now limited to the Fraser River (British Columbia, Canada), the Columbia River (Washington), and the Delta. Habitat use varies among populations. Portions of populations are considered anadromous, using fresh, brackish, and marine waters during different phases of their life history. White sturgeon are long-lived fish and can live as long as 100 years; however, fish that old are seldom found.

Upstream spawning migrations of white sturgeon in the Delta occur between February and June (Miller 1972, Kohlhorst 1976, Wang 2006). Only a portion of the total adult sturgeon population migrates upstream from the Delta each year. Sturgeon that do move upstream are believed to be mature and ready to spawn. White sturgeon spawn in the Sacramento River between mid-February and late May, with a peak in spawning (93%) occurring between March and April (Kohlhorst 1976).

The diet of sturgeon changes as the fish become larger. Young-of-year sturgeon (less than 8 inches long) feed on a number of prey, including small crustaceans and insect larvae, and can potentially consume small fish fry. As the fish grow, the diet becomes more diverse and includes several benthic invertebrates and seasonally abundant food items, such as fish eggs or fry.

Adult and subadult sturgeon inhabit estuarine areas year-round. Distribution in the Delta is thought to depend primarily on river flow and consequent salinity regimes. The center of the population is upriver during low-flow years and downriver during high-flow years.

Suitable Habitat Within the Study Area
The lower Sacramento River and Delta, including in and around the DCC and the study area, functions as rearing habitat and as a migration channel for white sturgeon.

Pacific Lamprey

Distribution, Biology, and Habitat Requirements

Pacific lamprey (*Entosphenus tridentatus*) are a CDFW species of special concern and are widely distributed. The species can be found in streams from Japan, through Alaska, and down to Baja California (Moyle 2002). Adult Pacific lamprey enter and reside in freshwater between a few months to a few years prior to spawning, but most spawn in the spring following their upstream migration (Goodman and Reid 2012). Spawning occurs in low-gradient rivers. Hannon and Deason (2008) documented Pacific Lampreys spawning in the American River from early January to late May, peaking in early April. The ammocoetes (larvae) remain in the streams for approximately five to seven years until they reach approximately 5 to 6 inches, at which time they begin their downstream migration. Most downstream migration occurs from early winter through summer.

Suitable Habitat Within the Study Area

The lower Sacramento River and Delta, including in and around the DCC and the study area, functions primarily as a migratory pathway for adult and juvenile Pacific lamprey.

River Lamprey

Distribution, Biology, and Habitat Requirements

River lamprey (*Lampetra ayresii*) is a CDFW species of special concern and is an anadromous species that occurs from near Juneau, Alaska, to San Francisco Bay, California (Moyle 2002). In California, river lamprey is found in the Central Valley, Napa River, Sonoma Creek, Alameda Creek, Salmon Creek, and in tributaries of the lower Russian River. In the Central Valley, river lamprey is found in small numbers in the lower Sacramento and San Joaquin River drainages.

River lamprey are anadromous, but spend most of their lives in fresh water. Adults spend only three to four months in the ocean, migrating to freshwater in fall in search of suitable spawning sites, often returning to their natal streams (Moyle 2002). Spawning occurs from February through June, and adults die after spawning (Moyle 2002). The eggs hatch into ammocoetes that remain in fresh water for approximately three to five years in silty or sandy low-velocity backwaters or stream edges where they bury into the substrate. The metamorphosis process into adults begins in the summer and takes approximately 9 to 12 months. Prior to entering the ocean, the lamprey congregate just upstream until their esophagus opens. Once this occurs, they can properly osmoregulate and can migrate to the ocean, where they remain roughly three to four months.

Suitable Habitat Within the Study Area

The lower Sacramento River and Delta, including in and around the DCC and the study area, functions primarily as a migratory pathway for adult and juvenile River lamprey.

Central Valley Steelhead

Distribution, Biology, and Habitat Requirements

Central Valley steelhead (*Oncorhynchus mykiss*) is an ESA threatened species that historically migrated upstream into the high gradient upper reaches of Central Valley streams and rivers for spawning and juvenile rearing. Construction of dams and impoundments on the majority of Central Valley rivers created impassable barriers to upstream migration and substantially reduced the geographic distribution of steelhead. Presently, Central Valley steelhead are found in the Sacramento River

downstream from Keswick Dam, in major tributary rivers and creeks in the Sacramento River watershed (Feather River, Yuba River, American River, and Battle, Mill, Deer, Clear and Butte Creeks), and in major tributaries of the San Joaquin River (Stanislaus, Tuolumne, Merced Rivers) and Delta (Calaveras River). The populations in the Feather and American Rivers are supported primarily by the Feather River and Nimbus hatcheries.

Adult steelhead migrate upstream through the northern portion of the Bay-Delta region (lower Sacramento River) from July through the late fall, with a secondary peak in late spring (likely downstream migration as post-spawn adults). Spawning typically occurs during the winter and spring (December through April) with the majority of spawning activity occurring during January and March. Juvenile steelhead rear in their freshwater environment for 1 to 3 years. Emigration occurs from early winter to early summer, with a peak migration through the Delta in December or January through June (McEwan 2001).

Suitable Habitat Within the Study Area

The lower Sacramento River and Delta, including in and around the DCC and study area, functions primarily as a migration channel for Central Valley steelhead, although some rearing can occur in areas with suitable habitat.

Sacramento River Winter-Run Chinook Salmon

Distribution, Biology, and Habitat Requirements

Winter-run Chinook salmon (*O. tshawytscha*) is an ESA and CESA endangered species. The Sacramento River upstream from Red Bluff Pumping Plant and Battle Creek are the only spawning streams for winter-run Chinook salmon, which have been in a major decline since the 1960s. Adult winter-run Chinook salmon migrate through the Bay-Delta region (typically November through June) into the Sacramento River in winter but delay spawning until mid-April to August.

Winter-run Chinook salmon move upstream much more quickly and then hold in the cool waters downstream of Keswick Dam for an extended period before spawning. Downstream juvenile migration may begin in late July, peaking in the fall, and can continue until mid-March in drier years (Vogel and Marine 1991). The majority of the juveniles emigrate past the Red Bluff Pumping Plant, as fry and rear in the river downstream (Martin et al. 2001) before emigrating to the Delta, primarily during November through early May (peak in March). Juveniles may spend about five months to nine months in the river and estuary systems before entering the ocean.

Suitable Habitat Within the Study Area

The lower Sacramento River and Delta, including in and around the DCC and study area, functions primarily as a migratory pathway for adult and juvenile winter-run Chinook salmon, although some juvenile rearing can occur in areas with suitable habitat.

Central Valley Spring-Run Chinook Salmon

Distribution, Biology, and Habitat Requirements

Central Valley spring-run Chinook salmon is an ESA and CESA threatened species. Historically, spring-run Chinook salmon in the Sacramento River basin were found in the upper and middle reaches (1,000 to 6,000 feet) of the American, Yuba, Feather, Sacramento, McCloud and Pit Rivers,

as well as smaller tributaries of the upper Sacramento River downstream of present-day Shasta Dam (NMFS 2009). Naturally spawning populations of spring-run Chinook salmon currently are restricted to accessible reaches of the upper Sacramento, Feather, and Yuba Rivers, and Antelope, Battle, Beegum, Big Chico, Butte, Clear, Deer, and Mill Creeks.

Adult spring-run Chinook salmon begin their upstream migration in late January and early February and enter the Sacramento River between March and September, peaking in May and June (Moyle 2002). Adults hold in deep, cold pools near spawning habitat until spawning commences in primarily in September and October. Juvenile spring-run Chinook salmon rear in natal tributaries, the Sacramento River mainstem, and non-natal tributaries to the Sacramento River (California Department of Fish and Game 1998). Spawning occurs in late summer and early fall. Emigration timing is highly variable, as the juveniles may migrate downstream as young-of-year or as yearlings. Young-of-year juveniles are typically present in the norther Delta from December through May (peak in March and April), and yearlings are typically in the Bay-Delta region in late fall and early winter (late October through January) (NMFS 2019).

Suitable Habitat Within the Study Area

The lower Sacramento River and Delta, including in and around the DCC and the study area, functions primarily as a migratory pathway for adult and juvenile spring-run Chinook salmon, although some juvenile rearing can occur in areas with suitable habitat.

Central Valley Fall/Late Fall-Run Chinook Salmon

Distribution, Biology, and Habitat Requirements

Central Valley fall/late fall-run Chinook salmon are a CDFW species of special concern and are considered a single evolutionarily significant unit, even though their life stages occur at different times. Fall-run Chinook salmon spawn in most systems throughout the Sacramento and San Joaquin watershed, while late fall-run Chinook salmon primarily spawn in the upper Sacramento River.

Adult fall-run Chinook salmon migrate into the Sacramento River and its tributaries from July through December. Fall-run Chinook salmon spawn during early October through late December and incubation takes place during October through March. The peak of spawning is in October and November as water temperature drops. A portion of the fry population migrate downstream soon after emergence, where they rear within the lower river channels, Delta, and Suisun Bay during the spring months (Baker and Morhardt 2001). The remaining portion of juvenile Chinook salmon continue to rear in the upstream stream systems through the spring months, until they undergo smoltification, which typically takes place between April and early June, before migrating downstream, through the Delta towards the ocean.

Late fall-run Chinook salmon migrate into the Sacramento River from October through April and spawn from January through April. Peak spawning activity in February and March is followed by egg incubation from January through June, and fry emergence from April through June. Rearing and emigration of fry and smolts occur from April through December. Juvenile Chinook salmon rear in the streams during summer, and in some streams, they remain throughout the year.

Suitable Habitat Within the Study Area
The lower Sacramento River and Delta, including in and around the DCC and study area, functions primarily as a migratory pathway for adult and juvenile fall/late fall-run Chinook salmon, although some juvenile rearing can occur in areas of suitable habitat.

Delta Smelt

Distribution, Biology, and Habitat Requirements
Delta smelt (*Hypomesus transpacificus*) is an ESA threatened and a CESA endangered species that are endemic to the Delta and Suisun Marsh (Moyle et al. 1992; Bennett 2005). During the spawning season, adults move into the channels and sloughs of the Delta. When Delta outflows are high, delta smelt may occur in San Pablo Bay. Delta smelt have relatively low fecundity and most live for one year (Moyle 2002). Current surveys have found very few individuals, and there is concern about the stability and status of the population. In 2010 following a 12-month finding on a petition to reclassify delt smelt as endangered, USFWS deemed delta smelt warranted listing as endangered, but was precluded from reclassification by other higher priority listing actions (USFWS 2019).

In the fall, prior to spawning, delta smelt are found in the Delta, Suisun and San Pablo Bays, the Sacramento River and San Joaquin River confluence, Cache Slough, and the lower Sacramento River (Murphy and Hamilton 2013). Adult delta smelt begin a spawning migration, which may encompass several months, toward the Napa River and much of the Delta during January. Spawning occurs between February and May. Spawning occurs in shallow edge-waters in the upper Delta channels, including the Sacramento River above Rio Vista, Cache Slough, Lindsey Slough, and Barker Slough. Spawning has not been documented in the Sacramento River upstream from the DCC. Eggs are broadcast over the bottom, where they attach to firm sediment, woody material, and vegetation. Hatching takes approximately 9 to 13 days and larvae begin feeding four to five days later. Newly hatched larvae contain a large oil globule that makes them semi-buoyant and allows them to stay off the bottom. As their fins and swim bladder develop, they move higher into the water column. Most have metamorphosed into the juveniles by June or early July.

During and after larval rearing in fresh water, many young Delta smelt move with river and tidal currents to remain in favorable rearing habitats, often moving increasingly into the low salinity zone to avoid seasonally warm and highly transparent waters that typify many areas in the central Delta (Nobriga et al. 2008). Some delta smelt also rear in upstream areas such as the Cache Slough complex and Sacramento Deep Water Ship Channel, depending on habitat conditions (Sommer and Mejia 2013).

Suitable Habitat Within the Study Area
Delta smelt may be found in the vicinity of the DCC and the study area as adults or larvae.

Longfin Smelt

Distribution, Biology, and Habitat Requirements
Longfin smelt (*Spirinchus thaleichthys*) is an ESA candidate species and a CESA threatened species. Longfin smelt populations were historically found in the Klamath, Eel, and San Francisco estuaries, and in Humboldt Bay. From current sampling, populations reside at the mouth of the Klamath River and the Russian River estuary. In the Central Valley, longfin smelt are rarely found upstream

from Rio Vista or Medford Island in the Delta; however, they have been found upstream of the city of Sacramento. Adults typically concentrate in Suisun, San Pablo, and North San Francisco bays (Moyle 2002).

Longfin smelt are anadromous and euryhaline. Adults and juveniles are found in estuaries and can tolerate salinities from 0 parts per thousand (ppt) to pure seawater. After the early juvenile stage, they prefer salinities in the 15 through 30 ppt range (Moyle 2002).

Longfin smelt are found in San Pablo Bay in April through June and disperse in late summer. In fall and winter, yearlings move upstream into freshwater to spawn. Spawning occurs below Medford Island in the San Joaquin River and below Rio Vista on the Sacramento River, as early as November, and larval surveys indicate spawning may extend into June (Moyle 2002).

The adhesive eggs hatch in approximately 40 days. The buoyant embryos move into the upper part of the water column and are carried into the estuary. High outflows transport the larvae into Suisun and San Pablo Bays. In low-outflow years, larvae move into the western Delta and Suisun Bay. Higher outflows reflect positively in juvenile survival and adult abundance. Rearing habitat is better in Suisun and San Pablo bays because juveniles require brackish water in the 2 to 18 ppt range. If juveniles stay in the Delta, they are exposed to more adverse conditions (Moyle 2002).

Suitable Habitat Within the Study Area
Longfin smelt are unlikely to be found in the vicinity of the DCC and the study area.

Sacramento Splittail

Distribution, Biology, and Habitat Requirements
The Sacramento splittail (*Pogonichthys macrolepidotus*) is a CDFW species of special concern. Sacramento splittail endemic to the San Francisco Estuary and watershed (Moyle 2002). Splittail regularly inhabit the Sacramento River upstream to the Red Bluff Diversion Dam and its tributaries including the Cosumnes and Mokelumne rivers, and the San Joaquin River and its tributaries. Splittail also inhabit the Napa and Petaluma River drainages and marshes, but these have been found to be genetically distinct from the Delta populations (Baerwald et al. 2008).

Adult splittail gradually migrate upstream to spawning areas in the winter and spring. Seasonal floodplain inundation provides both spawning and foraging habitat for splittail. When floodplain inundation does not occur in the Yolo or Sutter bypasses, adult splittail will migrate farther upstream to suitable habitats along channel margins to spawn (Feyrer et al. 2005). In the eastern Delta, the floodplain along the lower Cosumnes River appears to be important as spawning habitat.

During late winter and spring, young-of-year juvenile splittail (i.e., production from spawning in the current year) are found in sloughs, rivers, and Delta channels near spawning habitat. Juvenile splittail gradually move from shallow, nearshore areas to the deeper, open water habitat of Suisun and San Pablo bays (Wang 1986). Young splittail may occur in shallow and open waters of the Delta and San Pablo Bay, but they are particularly abundant in the northern and western Delta (Sommer et al. 1997; State Water Board 1999).

Suitable Habitat Within the Study Area
Sacramento splittail occur in and around the DCC and the study area as adults and juveniles.

5.4.3 Special-Status Herpetofauna

The Western Pond Turtle

Distribution, Biology, and Habitat Requirements
Western pond turtles are not listed under the ESA or CESA but are considered a CDFW species of special concern. Western pond turtles are a small to medium size turtle usually dark brown or olive in color with an unkeeled carapace. Western pond turtles range extends from the Washington through western Oregon and California, south to Baja California. Western pond turtles are typically active from spring to early fall depending on temperature but may be active during warmer winter periods. During winter, the turtles go into hibernation and estivation which can be done either under water or burrows in sandy soils associated with woodlands. During their active period they occupy slow water aquatic habitats like ponds, lakes, streams, marshes, and irrigation ditches. They require platforms for basking including sun exposed rocks, logs, cattail matts, or stream banks. Hatchlings require shallow water with dense submergent or short emergent vegetation.

Western pond turtles mate in spring and summer between late April and early August. Nesting sites occur in sandy soils in upland areas in the vicinity of their aquatic site. Hatchlings may emerge in late summer or fall, but some turtles may overwinter in the nest and emerge the following spring (Ernst et al. 2009).

Occurrence Records
Several western pond turtles were documented within the study area during the wildlife surveys. There are six CNDDB occurrences of this species either in or within 5 miles of the study area.

Suitable Habitat Within the Study Area
The open water habitat within the DCC provides suitable aquatic habitat and the adjacent rip-rap along the channel banks provides suitable basking habitat for the western pond turtle in the study area. Upland vegetated habitats only provide marginal nesting habitat for the species.

Giant Garter Snake

Distribution, Biology, and Habitat Requirements
Giant garter snake is an ESA and CESA threatened species. Giant garter snakes inhabit marshes, sloughs, ponds, small lakes, small streams, agricultural rice fields, drainages, and canals, and is typically absent from fast-moving, water bodies such as high gradient streams, and large lakes which often lack vegetative cover. Giant garter snake also use adjacent upland sites for nesting and hibernation. The species is generally considered active from May 1 to September 30. The period from October 1 to April 30, is considered the snakes' hibernation period and they are typically in underground refugia (e.g., burrows, riprap, debris piles, etc.) during this time.

Occurrence Records
The CNDDB recorded two separate occurrences of giant garter snake within 0.5 miles of the study area. Details of the CNDDB occurrences are provided in Attachment A.

Suitable Habitat Within the Study Area
Stantec performed a survey on March 30, 2021 to assess the aquatic and upland habitats within the study area for suitability as giant garter snake habitat. The survey determined that the conditions present in the study area provide limited habitat to support the giant garter snake, but the species could disperse into the study area from areas of suitable habitat outside the study area (e.g., Snodgrass Slough). The open water of DCC in the study area does not provide suitable aquatic habitat for the species as it is too deep and wide and does not support dense stands of emergent vegetation that giant garter snake needs for cover and foraging habitat. The upland areas adjacent to the channel, are generally shaded by mature riparian tree canopy and lack the sunny, grassy conditions that the species prefers to bask in during periods of inactivity. The uplands in the study area also lacked burrows or other refugia that would be located above the high tide line to serve as giant garter snake overwintering habitat during extended periods of inactivity.

Special-status and Other Protected Birds
Birds nest in a variety of places, including trees, shrubs, man-made structures, and the ground. This section describes the special-status and migratory birds protected under the MBTA and under Sections 3500-3516 of the FGC for game birds and birds of prey that have potential to occur in the study area. Several bird species including raptors, waterfowl, and passerines occur within the study area and were observed during the field surveys occurring during the 2021 field season (Table 4-7).

5.4.4 Special-Status and Nesting Migratory Passerines

Grasshopper sparrow (*Ammodramus savannarum*), yellow warbler (*Dendroica petechia*), yellow-breasted chat (*Icteria virens*), and Modesto song sparrow (*Melospiza melodia*) and other migratory birds protected under the MBTA and FGC Section 3500-3516 have potential to occur or are known to occur in the study area.

Distribution, Biology, and Habitat Requirements
Grasshopper sparrow, yellow warbler, yellow-breasted chat, and Modesto song sparrow and the other protected migratory passerines have been known to nest and forage in a variety of habitats and land cover types such as woodlands and shrublands, grasslands, open water, and emergent wetlands. Many of the passerines that nest in the area arrive in early spring (e.g., late February/early March) and nesting activities continue well into late summer (e.g., July/August). General descriptions of each of the four special-status passerine species habitat preferences and breeding/nesting season timing are provided below.

The grasshopper sparrow prefers to nest in grasslands and shrub habitats. It nests on the ground, very well hidden at the base of weed, shrub, or clump of grass and the nesting season typically occurs between May and August (CDFW 2014).

Both the yellow warbler and yellow breasted chat nest in dense woody riparian areas. The yellow warbler nest in areas that contain tree species such as willows (*Salix* spp.) and cottonwoods (*Populus* spp.). Yellow warblers construct their nests in upright forks of branches in shrubs, small trees, and briars from 2 to 60 feet above ground (CDFW 2014). Yellow warblers typically breed from mid-April into early August. The yellow breasted chat nests in low, dense vegetation such as raspberry

and blackberry (*Rubus* spp.), California wild grape (*Vitis californica*), dogwood (*Cornus* spp.), California wild rose (*Rosa californica*), honeysuckle (*Lonicera* spp.), and sumac (*Rhus* spp.). Their nests are typically 1 to 8 feet above the ground, supported by branches and often by masses of vegetation. The typical nesting season for yellow breasted chat is May through July (CDFW 2014).

Modesto song sparrow nest in emergent freshwater wetlands dominated by tules (*Schoenoplectus* spp.) and cattails (*Typha* spp.) as well as riparian willow thickets, or riparian forests dominated by valley oaks with dense understory of blackberry (Rubus spp.) shrub layer in close proximity to water (Shuford and Gardali, 2008).

Occurrence Records

Table 5-1 below shows the CNDDB occurrences within 5 miles of the study area for the special-status passerine species with a potential to occur.

Table 5-1. Special-status Passerines California Natural Diversity Database Occurrences Within 5 Miles of the Study Area

Species	Nearest CNDDB Occurrence Records to the Study Area
Grasshopper sparrow	No CNDDB occurrences within 5 miles of the study area.
Yellow warbler	No CNDDB occurrences within 5 miles of the study area.
Yellow breasted chat	No CNDDB occurrences within 5 miles of the study area.
Modesto song sparrow	No CNDDB occurrences within 5 miles of the study area.

Key:
CNDDB = California Natural Diversity Database

Suitable Habitat Within the Study Area

Several habitats present in the study area provide potential nesting and foraging habitat for the four special-status passerine species. Woody riparian habitats, suitable for yellow warbler and yellow breasted chat, are present in in the study area along the DCC. Grasslands and shrublands are also present, that could support grasshopper sparrow nesting habitat. Given the presence of suitable nesting and foraging habitat within the study area, grasshopper sparrow, yellow warbler, yellow-breasted chat, and Modesto song sparrow all have a moderate potential or high potential to occur within the study area.

The study area also provides potential nesting and foraging habitat for a variety of migratory birds protected under the MBTA and species protected under Sections 3500-3516 of the FGC. These bird species may utilize habitats and land cover types such as the oak and riparian woodlands, annual grasslands, manmade structures (e.g., the DCC Bridge), and the gravel roads present in the study area for nesting. Migratory birds that have been documented in the study area during survey efforts include species such as California scrub jay (*Aphelocoma californica*), Canada goose (*Branta canadensis*), common merganser (*Mergus merganser*), acorn woodpecker (*Melanerpes formicivorus*), and California quail (*Callipepla californica*).

Swainson's Hawk

Distribution, Biology, and Habitat Requirements

Swainson's hawks is a CESA threatened species. Swainson's hawk nest in stands with few trees in juniper-sage flats, riparian areas, oak savannah, and open agricultural habitats. They require adjacent open fields for foraging including livestock pastures, grasslands, alfalfa, or grain fields. Swainson's hawks are migratory and typically begin arriving in their breeding territory in the Central Valley in early March to April and immediately begin reconstructing previously used nests or constructing new ones (Estep 2009). They typically begin their southerly migration in early August to mid-September (Estep 2009).

Occurrence Records

The CNDDB recorded 38 separate occurrences of Swainson's hawk within 0.5 miles of the study area between 1985 and 2011 (Figure 4-3). Details of the CNDDB occurrences are provided in Attachment A.

Suitable Habitat Within the Study Area

Stantec performed protocol-level nesting surveys for Swainson's hawk within the 0.5-mile buffer of the study area between February and July 2021. Survey findings are presented in Figure 5-3 and discussed below.

Figure 5-3. Swainson's Hawk Survey Results Within the Delta Cross Channel Gate Upgrades Project Study Area

Surveys performed during Period I and the early part of Period II identified a total of seven potentially suitable nests within the survey area. Of these, two were subsequently determined to be active Swainson's hawk nests (N05), two were determined to be other active raptor nests (red-tailed hawk [N04] and Northern harrier [N06]), one was removed due to tree trimming (N07), and two were inactive (N01 and N03). A summary of observations made in each survey period is described below.

During Period I surveys, conducted in February 2021, no observations of overwintering Swainson's hawks were made within the survey area (0.5-mile buffer of the study area). During the Period II surveys, conducted in late March and early April 2021, a total of 15 Swainson's hawk observations were made throughout the survey area. The most common observations were of Swainson's hawk perched, soaring, and carrying nest materials. During Period III surveys, conducted in mid-April 2021, a total of 16 Swainson's hawk observations were made throughout the survey area. The most common observations during this period were of Swainson's hawks soaring, perched, and exhibiting territorial behavior.

During Period III, two active Swainson's hawk nests were observed throughout the survey area (Figure 5-3). Nests were marked as active during this period when Swainson's hawk were observed carrying nest material to the nest and/or perched adjacent to the nest. No nests were located within or immediately adjacent to the study area, and the closest active nest was located approximately 0.4 miles north-northeast of the study area. Of the two active Swainson's hawk nests observed in Period III, the fledgling success was not able to be determined at either of the nests. This was due to a dense tree canopy and lack of clear sightline for both nest locations, which made direct observations into the nest location impossible during these surveys. During the Period V survey, a total of six Swainson's hawk observations were made throughout the study area, consisting of Swainson's hawk perched or soaring; however, no nest fledglings were observed at the two nest locations.

While Swainson's hawk were observed nesting at two locations outside of the study area, the study area itself contains marginal/low quality nesting and foraging habitat. As such, the potential for Swainson's hawk to occur within the study area is moderate.

Other Special-Status and Protected Raptor Species

Distribution, Biology, and Habitat Requirements

Long-eared owl (*Asio otus*), Northern harrier (*Circus hudsonius*), and white-tailed kite (*Elanus leucurus*) and other protected raptor species listed under the MBTA and FGC are known to nest and forage in a variety of habitats and land cover types such as woodlands and shrublands, and grasslands. Nests can occur in multiple locations, including but not limited to, the branches of trees or shrubs, tree cavities, on the ground, or in burrows. Many of the raptor species could nest in the area typically beginning their nesting activities as early as January/February and can continue well into late summer (e.g., July/August). General descriptions of each of these special-status raptor species habitat preferences and breeding/nesting season timing are provided below.

Long-eared owls are generally associated with riparian bottomlands with tall willows and cottonwoods, or corridors of oak trees paralleling water courses. They require adjacent open land,

with adequate rodent populations and the presence of old nests of crows, hawks, or magpies for breeding. Breeding season occurs between early March to late July (CDFW 2014).

Norther harriers are generally associated with grassland and marsh (both saline and freshwater) habitats. They nest on the ground in shrubby vegetation, usually at the edge of wetland or marsh habitats. Nests are built of a large mound of sticks, usually in a dense clump of vegetation such as willows, grasses, sedges, reeds, bulrushes, and cattails. Breeding occurs between April to September, with peak activity in June and July (CDFW 2014).

White-tailed kites are generally associated with rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Foraging occurs in open grasslands, meadows, or marshes with adjacent dense-topped trees (growing in isolation or within a forested area) for nesting and perching. They typically nest in the upper third of trees that may be range in height from approximately 20 to 100 feet. Nests are built of mostly small twigs and lined with grass, hay, or leaves. Breeding season occurs between breeds from February to October, with peak activity between from May and August (CDFW 2014).

Occurrence Records

Table 5-2 below shows the CNDDB occurrences within 5 miles of the study area for the special-status raptor species with a potential to occur.

Table 5-2. Special-status Raptor California Natural Diversity Database Occurrences within 5 Miles of the Study Area

Species	Nearest CNDDB Occurrence Records to the Study Area
Long-eared owl	There are no CNDDB occurrences within 5 miles of the study area.
Northern harrier	There are no CNDDB occurrences within 5 miles of the study area; however, this species was observed nesting during Swainson's hawk surveys approximately 0.3 miles northwest of the study area.
White-tailed kite	There are no CNDDB occurrences within 5 miles of the study area; however, this species was observed soaring over the study area during Swainson's hawk surveys.

Key:
CNDDB = California Natural Diversity Database

Suitable Habitat within the Study Area

The study area provides potentially suitable nesting and foraging habitat for long-eared owl, Northern harrier, white-tailed kite, and other protected raptor species. Wild oats grasslands occur in small openings between the other habitat types within the study area and would only provide marginal quality foraging habitat for long-eared owl, Northern harrier, white-tailed kite, and several other protected raptor species but larger expanses of suitable open grassland and pasture occur

outside of the study area to the east and south. The forested habitat in the study area, Fremont cottonwood forest and woodland and valley oak woodland and forest, provide suitable nesting habitat for the raptor species. The sandbar willow thickets would also provide suitable nesting habitat for white-tailed kites.

Based on the potential nesting and foraging habitat within the study area, the long-eared-owl has a moderate potential to occur within the study area. The white-tailed kite and Northern harrier, both have been observed within the study area and are present.

5.4.5 Special-Status Mammals

Western Red Bat

Distribution, Biology, and Habitat Requirements

The study area is within the species range for western red bat which is a CDFW species of special concern. Western red bats typically roost in dense riparian tree foliage. Western red bat young are born typically between April and July with the young being volant by July and August (CDFW 2014).

Occurrence Records

There are two CNDDB occurrence records for western red bat within 5 miles of the study area. Two CNDDB occurrences both dated from July 1999; one located approximately 2.70 miles southwest from the study area on Grand Island (just south of Ryde), and a second occurrence dated located approximately 3.67 miles southeast of the study area on Grand Island (1.3 miles east-northeast of Howard Landing).

Suitable Habitat Within the Study Area

The forested habitat in the study area, including the Fremont cottonwood forest and woodland and the valley oak woodland and forest, provides suitable roosting and foraging habitat for western red bat. Given the nearby CNDDB occurrences, there is a high potential for the species to occur in the study area.

Chapter 6 Recommended Avoidance and Minimization Measures

There is potential for the project to result in impacts on sensitive biological resources such as aquatic resources (i.e., WOTUS and waters of the state), sensitive natural communities, and special-status species and their habitat. If impacts on these sensitive biological resources are anticipated, the following avoidance and minimization measures (AMM) are recommended for incorporation into the Project to avoid and minimize direct and indirect effects on sensitive biological resources. The mitigation measures from the *Delta Plan Amendments Mitigation Monitoring and Reporting Plan* (Delta Stewardship Council 2013) are also incorporated (as noted) in AMM 1 and AMM 2, below.

6.1 General Measures

- **AMM 1** *(Delta Plan Mitigation Measure 4-1)***.** Avoid, minimize, and compensate for reduction in area and/or habitat quality of sensitive natural communities, including wetlands, by doing the following:

  - Selecting project site(s) that would avoid sensitive natural communities, including jurisdictional wetlands and other waters, vernal pools, alkali seasonal wetlands, riparian habitats, and inland dune scrub.

  - Designing, to the maximum extent practicable, project elements to avoid effects on sensitive natural communities.

  - Replacing, restoring, or enhancing on a "no net loss" basis (in accordance with U.S. Army Corps of Engineers (USACE) and State Water Resources Control Board (SWRCB) requirements), wetlands and other waters of the United States and waters of the State that would be removed, lost, and/or degraded.

  - Where impacts to sensitive natural communities other than waters of the United States or State are unavoidable, compensating for impacts by restoring and/or preserving in-kind sensitive natural communities on-site, or off-site at a nearby site, or by purchasing in-kind restoration or preservation credits from a mitigation bank that services the project site and that is approved by the appropriate agencies, in consultation with applicable regulatory agencies (at ratios that offset temporal loss of habitat value).

  - Implement advanced mitigation planning for ecosystem restoration prior to construction.

  - Implement construction best management practices, including:

- Developing and implementing a Stormwater Pollution Prevention Plan (SWPPP).
- Minimizing soil disturbance, erosion, and sediment runoff from project site.
- Avoiding and minimizing contaminant spills.
- Minimizing visual and noise disturbance from construction activities.
- Conducting biological construction monitoring to ensure that implemented Best Management Practices and AMMs are effective.

– Restore areas temporarily affected by construction activities, including:

- Preparing restoration plan for temporary impacts sites for review by resource agencies.
- Minimizing soil disturbance and stockpiling topsoil for later use in any areas to be graded.
- Decompacting or amending soil if necessary before planting and use native species for revegetation.

– An invasive species management plan should be developed and implemented for any project whose construction or operation could lead to introduction or facilitation of invasive species establishment. The plan should ensure that invasive plant species and populations are kept below preconstruction abundance and distribution levels. The plan should be based on the best available science. The invasive species management plan should include the following elements:

- Nonnative species eradication methods (if eradication is feasible)
- Nonnative species management methods
- Early detection methods
- Notification requirements
- Best management practices for preconstruction, construction, and post construction periods
- Monitoring, remedial actions and reporting requirements
- Provisions for updating the target species list over the lifetime of the project as new invasive species become potential threats to the integrity of the local ecosystems

- **AMM 2** *(Delta Plan Mitigation Measure 4-2)*. The following measures would be implemented to avoid special-status species and their habitats:

  - Select project site(s) that would avoid habitats of special-status species (which may include foraging, sheltering, migration and rearing habitat in addition to breeding or spawning habitat), and to the maximum extent practicable, (re)design project elements to avoid effects on such species.

  - Schedule construction to avoid special-status species' breeding, spawning, or migration locations during the seasons or active periods that these activities occur.

  - Conduct preconstruction surveys (by a qualified biologist) for special-status species in accordance with U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and DFW survey methodologies and appropriate timing to determine presence and locations of any special-status species and their habitat, and avoid, minimize, or compensate for impacts to special-status species in coordination with DFW and USFWS or NMFS.

  - Establish buffers around special -status species habitats to exclude effects of construction activities. The size of the buffer shall be in accordance with USFWS and DFW protocols for the applicable special-status species. If nest tree removal is necessary, remove the tree only after the nest is no longer active, as determined by a qualified biologist.

  - Conduct construction monitoring (by qualified biologist) to ensure effectiveness of avoidance and minimization measures and implement re medial measures if necessary.

  - When appropriate, relocate special-status plant and animal species or their habitats from project sites following USFWS, NMFS, and CDFW protocols (e.g., for special-status plant species or elderberry shrubs).

- **AMM 3.** Vehicle traffic will be restricted to established roads, construction areas, and other designated areas, and shall not exceed a speed limit of 15 mph in undeveloped portions of the workspaces (i.e., unpaved access roads).

- **AMM 4.** Trash and food items shall be placed in closed containers and removed daily to reduce the attractiveness to opportunistic predators.

- **AMM 5.** Workers shall be prohibited from bringing pets and firearms to the project area and from feeding wildlife.

- **AMM 6.** A Worker Environmental Awareness Training Program for construction personnel will be conducted by a USFWS -approved biologist for all construction workers including contractors, prior to the start of construction activities. This training instructs workers to recognize the target special-status species and their habitats.

6.2 Sensitive Habitat Avoidance

- **BMP 7.** Aquatic resources subject to agency jurisdiction that are temporarily affected by Project construction will be restored as close as practicable to their original contour and conditions within 10 days of the completion of construction activities.

- **AMM 8.** Implement erosion and sediment controls measures to avoid increased sediment delivery to the flowing channel.

- **AMM 9.** Utilize Spill Prevention Measures to prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water through appropriate measures, including training personnel in spill prevention and making equipment and materials for cleanup of spills available on site.

- **AMM 10.** Restrict vehicle and equipment cleaning to appropriate locations requiring that vehicles and equipment only be washed at designated areas approved by Reclamation. Where feasible the locations will be located 150 feet or more from a water body or locations where run-off discharge could enter a water body.

6.3 Terrestrial Wildlife Species

- **AMM 11.** Plastic monofilament netting, loosely woven netting, or similar material in any form will not be used for erosion control or other purpose at the Project site because wildlife can become entangled and trapped in them. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer, or other synthetic materials will not be used.

- **AMM 12.** Pre-construction surveys for western pond turtle will be conducted no more than 30 days prior to construction to ensure no turtles are present within the construction area. If a pond turtle nest is found, the biologist shall flag the site and determine if construction activities can avoid affecting the nest. If the nest cannot be avoided, it will be excavated and re-buried at a suitable location outside of the construction impact zone by a qualified biologist. CDFW will be informed when such an activity occurs.

6.4 Nesting Bird Species

- **AMM 13.** Vegetation removal, grading, and other construction activities shall be scheduled to avoid the breeding season for nesting raptors and other special-status birds (i.e., February 1 through September 31) to the extent practicable. If construction occurs outside of the breeding season, no further mitigation is necessary. If the breeding season cannot be completely avoided, then nesting bird surveys will be required as described in AMM 15 (below).

- **AMM 14.** If vegetation removal is scheduled during the breeding season (February 1 through September 31), a qualified biologist shall conduct a minimum of one pre-construction survey for nesting migratory birds and raptors within the study area and a 250-foot buffer around the study area (where accessible) for all construction related activities that will occur during the nesting season. The pre-construction survey shall be conducted no more than 15 days prior to the initiation of construction in a given area and will be phased based on construction schedule. Due to the ongoing, phased approach to construction, multiple pre-construction surveys per year may be required.

- **AMM 15.** If an active nest is found during nesting bird surveys, appropriate conservation measures (as determined by a qualified biologist) shall be implemented. These may include but are not limited to: establishing a construction-free buffer will be around the active nest site; biological monitoring of the active nest site; and/or delaying construction activities in the vicinity of the active nest site until the young have fledged (based on field verification by a qualified biologist).

6.5 Special-status Animals Best Management Practices – Roosting Bats

- **AMM 16.** To the extent practicable, removal of large trees with cavities shall occur before maternity colonies form (i.e., prior to March 1) or after young are volant (i.e., after August 31).

- **AMM 17.** If construction, including the removal of large trees, occurs during the non-volant season (March 1 through August 31), a qualified biologist shall conduct a pre-construction survey of the study area for maternity colonies. The pre-construction survey will be performed no more than 14 days prior to the implementation of construction activities (including staging and equipment access). If a lapse in construction activities for 14 days or longer occurs between those dates, another pre-construction survey will be performed. If any maternity colonies are detected, appropriate conservation measures (as determined by a qualified biologist) shall be implemented. These measures may include but are not limited to: establishing a construction-free buffer zone around the maternity colony site, biological monitoring of the maternity colony, and delaying construction activities in the vicinity of the maternity site.

- **AMM 18.** A bat species protection survey plan will be developed. The plan will include items such as having a qualified biologist present on-site to conduct monitoring during construction in/near bat roosting habitat.

- **AMM 19.** To the greatest extent practicable, structural changes may be made to any known roost proposed for removal (determined by pre-construction surveys), to create conditions in the roost that are undesirable to roosting bats and encourage the bats to leave on their own (e.g., open additional portals so that temperature, wind, light and precipitation regime in

the roost change). Structural changes to the roost would be performed during the appropriate exclusion timing (listed above) to avoid harming bats. To the greatest extent practicable, these trees would be removed in pieces, rather than felling the entire tree. It is recommended that removal be done late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators and will take place during warm weather conditions conducive to bat activity.

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Attachment A

Special Status Species Query Results

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Sacramento County, California

Local office

San Francisco Bay-Delta Fish And Wildlife

(916) 930-5603
(916) 930-5654

650 Capitol Mall
Suite 8-300
Sacramento, CA 95814

http://kim_squires@fws.gov

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
California Clapper Rail Rallus longirostris obsoletus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4240	Endangered
Yellow-billed Cuckoo Coccyzus americanus There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake Thamnophis gigas Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS

California Red-legged Frog Rana draytonii — Threatened
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not **available.**
https://ecos.fws.gov/ecp/species/2891

California Tiger Salamander Ambystoma californiense — Threatened
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/2076

Fishes

NAME	STATUS
Delta Smelt Hypomesus transpacificus Wherever found There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Delta Green Ground Beetle Elaphrus viridis Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/2319	Threatened
San Bruno Elfin Butterfly Callophrys mossii bayensis Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/3394	Endangered

Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus — Threatened
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not **available.**
https://ecos.fws.gov/ecp/species/7850

Crustaceans

NAME	STATUS

Conservancy Fairy Shrimp Branchinecta conservatio — Endangered
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/8246

Vernal Pool Fairy Shrimp Branchinecta lynchi — Threatened
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp Lepidurus packardi — Endangered
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/2246

Flowering Plants

NAME	STATUS

Large-flowered Fiddleneck Amsinckia grandiflora — Endangered

Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not **available.**

https://ecos.fws.gov/ecp/species/5558

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Delta Smelt Hypomesus transpacificus https://ecos.fws.gov/ecp/species/321#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Rail Laterallus jamaicensis — **Breeds Mar 1 to Sep 15**
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/7717

Burrowing Owl Athene cunicularia — Breeds Mar 15 to Aug 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9737

California Thrasher Toxostoma redivivum — Breeds Jan 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Clark's Grebe Aechmophorus clarkii — Breeds Jan 1 to Dec 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Lewis's Woodpecker Melanerpes lewis — Breeds Apr 20 to Sep 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9408

Long-billed Curlew Numenius americanus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5511

Marbled Godwit Limosa fedoa — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Rufous Hummingbird selasphorus rufus — **Breeds elsewhere**
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Whimbrel Numenius phaeopus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds elsewhere

Wrentit Chamaea fasciata
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds Mar 15 to Aug 10

Yellow-billed Magpie Pica nuttalli
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726
Breeds Apr 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based **on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.**

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

PSSR

PSSCx

OTHER

Pf

RIVERINE

R1UBV

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Quad Name **Isleton**
Quad Number **38121-B5**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - X
SRWR Chinook Salmon ESU (E) - X
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - X
Eulachon (T) -
sDPS Green Sturgeon (T) - X

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat - X
SRWR Chinook Salmon Critical Habitat - X
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - X

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH - X
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Isleton (3812125) OR Liberty Island (3812136) OR Courtland (3812135) OR Brucsville (3812134) OR Rio Vista (3812126) OR Thornton (3812124) OR Jersey Island (3812116) OR Bouldin Island (3812115) OR Terminous (3812114))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Agelaius tricolor tricolored blackbird	G1G2 S1S2	None Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	12 40	955 S:4	0	0	0	0	0	4	3	1	4	0	0
Anniella pulchra Northern California legless lizard	G3 S3	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	10 10	375 S:1	0	1	0	0	0	0	0	1	1	0	0
Anthicus antiochensis Antioch Dunes anthicid beetle	G1 S1	None None		20 20	6 S:1	0	0	0	0	0	1	1	0	1	0	0
Anthicus sacramento Sacramento anthicid beetle	G1 S1	None None	IUCN_EN-Endangered	15 30	13 S:3	0	0	0	0	0	3	2	1	3	0	0
Ardea herodias great blue heron	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	10 10	156 S:2	0	1	0	0	0	1	2	0	2	0	0
Athene cunicularia burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1 100	2011 S:18	0	5	3	1	0	9	7	11	18	0	0
Bombus crotchii Crotch bumble bee	G3G4 S1S2	None Candidate Endangered		7 21	437 S:2	0	1	0	0	0	1	0	2	2	0	0
Bombus occidentalis western bumble bee	G2G3 S1	None Candidate Endangered	USFS_S-Sensitive	25 25	306 S:1	0	0	0	0	0	1	1	0	1	0	0
Branchinecta lynchi vernal pool fairy shrimp	G3 S3	Threatened None	IUCN_VU-Vulnerable	5 20	791 S:3	0	1	2	0	0	0	0	3	3	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Brasenia schreberi watershield	G5 S3	None None	Rare Plant Rank - 2B.3	5 15	43 S:2	0	0	0	0	1	1	2	0	1	0	1
Buteo swainsoni Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	-10 30	2535 S:156	5	18	4	1	0	128	22	134	156	0	0
Carex comosa bristly sedge	G5 S2	None None	Rare Plant Rank - 2B.1	-21 10	32 S:17	1	6	10	0	0	0	1	16	17	0	0
Centromadia parryi ssp. parryi pappose tarplant	G3T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 5	39 S:1	0	0	0	0	1	0	1	0	0	0	1
Chloropyron molle ssp. molle soft salty bird's-beak	G2T1 S1	Endangered Rare	Rare Plant Rank - 1B.2	10 10	27 S:1	0	0	0	0	1	0	1	0	0	1	0
Cicuta maculata var. bolanderi Bolander's water-hemlock	G5T4T5 S2?	None None	Rare Plant Rank - 2B.1	0 0	17 S:2	0	0	0	0	0	2	2	0	2	0	0
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	G3 S2.1	None None		0 10	60 S:10	0	1	0	0	0	9	10	0	10	0	0
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T2T3 S1	Threatened Endangered	BLM_S-Sensitive NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	1 1	165 S:1	0	0	0	0	0	1	0	1	1	0	0
Desmocerus californicus dimorphus valley elderberry longhorn beetle	G3T2 S3	Threatened None		20 20	271 S:1	0	0	0	1	0	0	1	0	1	0	0
Elanus leucurus white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	0 5	180 S:2	0	0	2	0	0	0	1	1	2	0	0
Emys marmorata western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	-10 27	1398 S:39	1	18	5	3	0	12	22	17	39	0	0
Eucerceris ruficeps redheaded sphecid wasp	G1G3 S1S2	None None		7 7	4 S:1	0	0	0	0	1	0	1	0	0	1	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Extriplex joaquinana San Joaquin spearscale	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	5 5	127 S:2	0	0	0	0	0	2	2	0	2	0	0
Falco peregrinus anatum American peregrine falcon	G4T4 S3S4	Delisted Delisted	CDF_S-Sensitive CDFW_FP-Fully Protected USFWS_BCC-Birds of Conservation Concern	10 10	58 S:1	0	0	0	0	0	1	0	1	1	0	0
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	G2 S2.2	None None		10 10	68 S:1	0	1	0	0	0	0	1	0	1	0	0
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	G1 S1.1	None None		5 25	33 S:2	0	1	0	0	0	1	2	0	2	0	0
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	G5T3 S3	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	0 15	173 S:73	0	39	18	6	1	9	22	51	72	0	1
Hydrochara ricksecker Ricksecker's water scavenger beetle	G2? S2?	None None		10 10	13 S:1	0	0	0	0	0	1	0	1	1	0	0
Hygrotus curvipes curved-foot hygrotus diving beetle	G1 S1	None None		25 25	21 S:1	0	0	0	0	0	1	1	0	1	0	0
Hypomesus transpacificus Delta smelt	G1 S1	Threatened Endangered	AFS_TH-Threatened IUCN_EN-Endangered	0 5	27 S:16	0	0	1	1	0	14	0	16	16	0	0
Lasiurus blossevillii western red bat	G4 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	0 20	128 S:4	0	0	0	0	0	4	4	0	4	0	0
Lasiurus cinereus hoary bat	G3G4 S4	None None	IUCN_LC-Least Concern WBWG_M-Medium Priority	20 20	238 S:2	0	0	0	0	0	2	2	0	2	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Laterallus jamaicensis coturniculus California black rail	G3G4T1 S1	None Threatened	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	0 10	303 S:16	0	5	0	1	0	10	8	8	16	0	0
Lathyrus jepsonii var. jepsonii Delta tule pea	G5T2 S2	None None	Rare Plant Rank - 1B.2 SB_BerrySB-Berry Seed Bank SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	0 10	133 S:36	0	5	13	5	0	13	15	21	36	0	0
Legenere limosa legenere	G2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_UCBG-UC Botanical Garden at Berkeley	0 0	83 S:1	0	1	0	0	0	0	0	1	1	0	0
Lepidium latipes var. heckardii Heckard's pepper-grass	G4T1 S1	None None	Rare Plant Rank - 1B.2	10 10	14 S:1	0	0	0	0	0	1	1	0	1	0	0
Lepidurus packardi vernal pool tadpole shrimp	G4 S3S4	Endangered None	IUCN_EN-Endangered	10 15	324 S:3	0	1	0	0	0	2	2	1	3	0	0
Lilaeopsis masonii Mason's lilaeopsis	G2 S2	None Rare	Rare Plant Rank - 1B.1	0 15	198 S:100	1	50	22	7	0	20	38	62	100	0	0
Limosella australis Delta mudwort	G4G5 S2	None None	Rare Plant Rank - 2B.1	0 17	59 S:42	2	19	11	1	0	9	24	18	42	0	0
Linderiella occidentalis California linderiella	G2G3 S2S3	None None	IUCN_NT-Near Threatened	5 80	508 S:6	0	0	2	0	0	4	0	6	6	0	0
Melospiza melodia song sparrow ("Modesto" population)	G5 S3?	None None	CDFW_SSC-Species of Special Concern	-10 20	92 S:57	0	0	1	0	0	56	1	56	57	0	0
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	G3 S3.1	None None		15 15	126 S:2	0	0	0	0	0	2	2	0	2	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Oenothera deltoides ssp. howellii Antioch Dunes evening-primrose	G5T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	10 19	10 S:2	0	0	2	0	0	0	0	2	2	0	0
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	G5T2Q S2	Threatened None	AFS_TH-Threatened		31 S:4	0	0	0	0	0	4	0	4	4	0	0
Perdita scitula antiochensis Antioch andrenid bee	G1T1 S1	None None		18 18	2 S:1	0	0	0	0	1	0	1	0	0	0	1
Pogonichthys macrolepidotus Sacramento splittail	GNR S3	None None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern IUCN_EN-Endangered	20 20	15 S:1	0	1	0	0	0	0	1	0	1	0	0
Potamogeton zosteriformis eel-grass pondweed	G5 S3	None None	Rare Plant Rank - 2B.2		20 S:1	0	0	0	0	0	1	1	0	1	0	0
Riparia riparia bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	5 5	298 S:1	0	0	0	0	0	1	1	0	1	0	0
Sagittaria sanfordii Sanford's arrowhead	G3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	0 10	126 S:20	2	13	3	0	0	2	1	19	20	0	0
Scutellaria galericulata marsh skullcap	G5 S2	None None	Rare Plant Rank - 2B.2	0 10	39 S:4	0	2	0	0	0	2	2	2	4	0	0
Scutellaria lateriflora side-flowering skullcap	G5 S2	None None	Rare Plant Rank - 2B.2	0 10	13 S:13	0	7	5	0	0	1	1	12	13	0	0
Spirinchus thaleichthys longfin smelt	G5 S1	Candidate Threatened		-5 20	46 S:12	0	0	0	0	0	12	1	11	12	0	0
Sylvilagus bachmani riparius riparian brush rabbit	G5T1 S1	Endangered Endangered		0 0	16 S:1	0	0	0	0	0	1	0	1	1	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Symphyotrichum lentum Suisun Marsh aster	G2 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture	0 10	175 S:91	0	18	36	13	0	24	24	67	91	0	0
Taxidea taxus American badger	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	5 5	594 S:1	0	0	0	0	0	1	1	0	1	0	0
Thamnophis gigas giant gartersnake	G2 S2	Threatened Threatened	IUCN_VU-Vulnerable	-10 30	366 S:21	0	5	3	1	2	10	11	10	19	2	0
Trifolium hydrophilum saline clover	G2 S2	None None	Rare Plant Rank - 1B.2	10 15	56 S:2	0	1	0	0	0	1	1	1	2	0	0
Valley Oak Woodland Valley Oak Woodland	G3 S2.1	None None		10 10	91 S:1	1	0	0	0	0	0	1	0	1	0	0

Inventory of Rare and Endangered Plants of California

California Native Plant Society

Search Results

22 matches found. Click on scientific name for details

Search Criteria: Quad is one of **[3812124:3812125:3812126:3812136:3812135:3812134:3812115:3812114:3812116:]**

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	PHOTO
Azolla microphylla	Mexican mosquito fern	Azollaceae	annual/perennial herb	Aug	None	None	G5	S4	4.2	No Photo Available
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	None	None	G5	S3	2B.3	No Photo Available
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1	 Dean Wm. Taylor 1997
Centromadia parryi ssp. *parryi*	pappose tarplant	Asteraceae	annual herb	May-Nov	None	None	G3T2	S2	1B.2	No Photo Available
Centromadia parryi ssp. *rudis*	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	None	None	G3T3	S3	4.2	No Photo Available
Chloropyron molle ssp. *molle*	soft salty bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Nov	FE	CR	G2T1	S1	1B.2	No Photo Available
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	None	None	G5T4T5	S2?	2B.1	No Photo Available
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	No Photo Available
Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2	No Photo Available
Lasthenia ferrisiae	Ferris' goldfields	Asteraceae	annual herb	Feb-May	None	None	G3	S3	4.2	No Photo Available
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	None	None	G5T2	S2	1B.2	No Photo Available
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	No Photo Available
Lepidium latipes var. *heckardii*	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	None	None	G4T1	S1	1B.2	No Photo Available
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	G2	S2	1B.1	No Photo Available
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	None	None	G4G5	S2	2B.1	No Photo Available

Oenothera deltoides ssp. *howellii*	Antioch Dunes evening-primrose	Onagraceae	perennial herb	Mar-Sep	FE	CE	G5T1	S1	1B.1	No Photo Available
Potamogeton zosteriformis	eel-grass pondweed	Potamogetonaceae	annual herb (aquatic)	Jun-Jul	None	None	G5	S3	2B.2	No Photo Available
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	No Photo Available
Scutellaria galericulata	marsh skullcap	Lamiaceae	perennial rhizomatous herb	Jun-Sep	None	None	G5	S2	2B.2	 © 2021 Scot Loring
Scutellaria lateriflora	side-flowering skullcap	Lamiaceae	perennial rhizomatous herb	Jul-Sep	None	None	G5	S2	2B.2	No Photo Available
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	G2	S2	1B.2	No Photo Available
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	No Photo Available

Showing 1 to 22 of 22 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 1.0). Website https://www.rareplants.cnps.org [accessed 14 October 2021].

Attachment B

Representative Site Photographs

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Appendix B. Representative Site Photographs

Photo 1. View of gate structure at western end of Delta Cross Channel.

Photo 2. View of Delta Cross Channel (open water habitat) from gate location.

Appendix B. Representative Site Photographs

Photo 3. Representative view of Wild Oats Grasslands habitat; located on northern side of canal.

Photo 4. Representative view of Valley Oak Woodland habitat.

Appendix B. Representative Site Photographss

Photo 5. Representative view of Sandbar Willow Thickets.

Photo 6. Representative photo of Fremont Cottonwood Forest.

Appendix B. Representative Site Photographs

Photo 7. View of levee road along south side of Delta Cross Canal.

Photo 8. View of bristly sedge plant that was found in the study area.