Proposed Mitigated Negative Declaration
Decker Island Restoration Project

Lead Agency: California Department of Water Resources (DWR), 3500 Industrial Blvd., West Sacramento 95691.

Availability of Documents: DWR (in conjunction with the Department of Fish and Wildlife (CDFW) prepared a draft Initial Study in support of this Mitigated Negative Declaration. Copies of the Summary Page were provided to the State Clearinghouse on August 5, 2016, initiating a 30-day review period. Copies of the MND/IS can be requested from the Department of Water Resources.

Project Location: The Decker Island Restoration Project (Project) is located at the southeastern edge of Solano County, California in the western Sacramento-San Joaquin Delta at Latitude 38.087628, Longitude -121.715501. The Proposed Project encompasses 140 acre parcel on the eastern side of Decker Island bordered to the south and east by Horseshoe Bend, and to the west and north by property owned by DI Aggregate, Inc. The Project is within Section 13, Township 3 North, Range 2 East of the Mount Diablo Meridian, in the "Jersey Island, CA" 7.5 minute U.S. Geological Survey (USGS) topographic quadrangle.

Project Summary: The Decker Island Restoration Project is a tidal restoration project proposed by DWR and located in Solano County along the Sacramento River. The Project site is currently an established emergent wetland with muted tidal connectivity to Horseshoe Bend to the south that transitions to upland habitat in the north. The Project would enhance up to 140 acres of tidal wetland, associated high marsh, and riparian habitats, benefiting special status species like Delta Smelt (*Hypomesus transpacificus*), Chinook Salmon (*Oncorhynchus thaleichthys*), and Swainson's Hawk (*Buteo swainsoni*). The Project consists of three main elements: lowering a section of levee, reconfiguring internal berms, and excavating a southern breach. Lowering a 300 foot section of levee at the northern end of the Island to internal elevation would create a flow through system that would increase access for fish and inhibit the establishment of invasive vegetation. Reconfiguring the internal berms would assist in moving water on and off site and would provide upland habitat for wildlife within the existing tidal wetland. Widening the existing breach at the southern end of the Island would provide full tidal access to the site and raise internal water levels from 5.8 feet NAVD88 to 6.3 feet NAVD88. Restoration would be accomplished with minimal in-water work and would utilize biological surveys, work windows, biological monitors, erosion control methods, and construction best management practices to avoid and minimize impacts to physical and biological resources. The Project would result in the enhancement of 90 acres of tidal wetland, restoration of 22 acres of tidal wetland, an increase to fish access, and an increase to aquatic food web export.

Findings: The Initial Study has been prepared to determine if the Project could have a significant effect on the environment. Based on the Initial Study, it has been determined that the Project would not have any significant effects on the environment after implementation of mitigation measures. The mitigation measures identified in the Initial Study and a Mitigation

Monitoring and Reporting Plan will be adopted to ensure compliance with the required mitigation measures. This conclusion is supported by the following findings:

- The Project would result in no impacts to Agriculture and Forest Resources, Land use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, and Utilities and Service Systems.
- The Project would result in less than significant impacts to Aesthetics, Air Quality, Geology and Soils, Greenhouse Gases, and Transportation and Traffic.
- With the implementation of mitigation measures, the Proposed Project would have less than significant impacts on Biological Resources, Cultural Resources, Hazards and Hazardous Materials, and Hydrology and Water Quality.

Mitigation Measures: The following mitigation measures will be implemented by DWR to avoid, minimize, or mitigate for potential environmental impacts. Implementation of these mitigation measures would reduce the potential environmental impacts of the Project to less than significant.

Mitigation Measures for Biological Resources

Mitigation Measure Bio-1: Avoid and minimize impacts to special status plants.

A qualified biologist shall conduct pre-construction surveys for special status plants; if any are identified in the disturbance areas they shall be flagged and avoided. If any special status plants cannot be avoided other than Antioch Dunes Evening-primrose or Mason's Lilaeopsis, an attempt shall be made to transplant the individuals after consultation with CDFW and USFWS. Disturbance to Antioch Dunes Evening-primrose and Mason's Lilaeopsis shall be avoided.

Mitigation Measure Bio-2: In-water Work Window

All in-water work shall be limited to August 1 through October 31, a timeframe set by CDFW, USFWS, and NMFS as a time when special status fish are least likely to be present.

Minimization Measure Bio-3: Biological Monitor

A CDFW, USFWS, and NMFS approved biological monitor knowledgeable and experienced in the biology, life history, and identification characteristics of fish, wildlife, and plant resources with potential to be encountered during Project activities shall be present during all construction activities and shall have the authority to halt work if concern over fish, wildlife, or plant resources becomes apparent.

Minimization Measure Bio-4: Environmental Awareness Training

Environmental awareness training shall be conducted by a CDFW and USFWS approved biological monitor for all construction personnel prior to commencement of construction activities. This training shall include a brief overview of the life history of special status species likely to be encountered onsite, legal protections and penalties for unauthorized take, and an explanation of the relevant Environmental Commitments and Mitigation Measures.

Mitigation Measure Bio-5: Valley Elderberry Longhorn Beetle Protection Measures

DWR is in consultation with the USFWS regarding the elderberry shrubs on the Project site that are located within 100' of construction activities (the 7th plant is located approximately 1,500' from the nearest activity and would not be affect by construction activities). Additional measures may be added upon finalizing consultation.

The four elderberry plants located along the fence line and road separating the Project site from DI Aggregates property, and the 2 plants near the levee lowering site shall be fenced and flagged prior to construction activities. DWR shall provide a minimum setback of 20 feet from the dripline of each elderberry plant.

Each plant location shall have a sign along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The sign should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

Mitigation Measure Bio-6: Giant Garter Snake Construction BMPs

Standard construction BMPs, such as those listed below, shall be implemented for all phases of the Project regardless of work window:

- Staging areas shall be fenced with exclusionary fencing.
- If a giant garter snake is identified within the work zone, work shall not proceed until the snake has moved, on its own, out of the work zone.
- Vehicles and heavy construction equipment shall be confined to designated transportation routes and shall be limited to 15 miles per hour.
- Construction shall be confined to the minimal area necessary for Project activities. Environmentally sensitive areas will be flagged for avoidance.
- Non-entangling erosion control measures shall be implemented for all erosion control practices.
- After completion of construction activities, temporary fill shall be removed and the area reseeded with native grasses and forbs as appropriate.
- All construction activities shall occur in the daytime when giant garter snakes are more easily observed.

Mitigation Measure Bio-7: Giant Garter Snake Work Window and Surveys

Ground disturbing work shall be limited to the May 1- October 1 window. This is the active period for giant garter snakes, when they would most likely be able to avoid construction activities. DWR would consult with CDFW and USFWS if construction activities would occur in potential giant garter snake habitat between October 1 and April 30. Under this scenario, ground disturbing activities would be initiated prior to October 1 and would continue into October until construction activities are completed, no later than October 31. A daily pre-construction survey for giant garter snake shall be conducted immediately prior to construction. Construction personnel shall be alerted during a tailgate meeting that giant garter snake may be present in the area and should be avoided until has moved, on its own, out of the work zone.

Mitigation Measure Bio-8: Western Pond Turtle Surveys

A pre-construction survey for western pond turtles shall be conducted by a qualified biologist prior to daily construction activities. Construction personnel shall be alerted during a tailgate meeting that western pond turtles may be present in the area and should be avoided. If a western pond turtle is identified within the work zone, work shall not proceed until the turtle has moved, on its own, out of the work zone.

Minimization Measure Bio-9: Nesting Bird Surveys

This mitigation measure includes the following:

- Site preparation and construction activities should take place outside of nesting season (February 15–August 15) to avoid take via disturbance or destruction of nests or mortality of individuals. If work begins before this period and continues uninterrupted throughout the nesting season, the consistent disturbance may deter birds from nesting at the site and prevent take.
- If work must take place during March 15 – August 15, a preconstruction survey would be conducted within 14 days prior to the initiation of construction activity by a qualified biologist to identify nesting Swainson's Hawks within ½ mile of the construction footprint. If active Swainson's Hawk nests are found, appropriate non-disturbance buffers and avoidance measures would be developed in coordination with CDFW to avoid disturbance of nesting Swainson's Hawks based on individual bird behavior and construction-related disturbance that occurs. Surveys shall be repeated if a lapse in construction of 14 days or greater occurs. Surveys would be repeated annually if work takes place during subsequent nesting seasons.
- If work must take place during March 15–August 15 and use of non-disturbance buffers is infeasible, a qualified biologist shall be on site to monitor active nests. Monitoring requirements would be established in coordination with CDFW. Monitors would have authority to stop work if it appears that Swainson's Hawk nests are disturbed by construction activity, and CDFW would be contacted for further guidance.
- If work must take place during April 1–August 15, a preconstruction survey would be conducted within 14 days prior to the initiation of construction activity to identify nesting raptors within 500 feet, and other nesting birds within 100 feet of the construction footprint. Appropriate non-disturbance buffers would be established until nestlings have fledged. Surveys shall be repeated if a lapse in construction of 14 days or greater occurs during the nesting season.

Mitigation Measure Bio-10: Bat Habitat Assessment and Avoidance

A habitat assessment shall be conducted by a qualified biologist for bats at work sites where trees would be removed or otherwise disturbed for a period of more than 2 hours. The habitat assessment shall include a visual inspection of features within 50 feet of the work area for potential roosting features (bats need not be present) no more than 48 hours prior to disturbance of such features. Habitat features found during the survey shall be flagged or marked. All assessment results shall be submitted to CDFW for review. If bats (individuals or colonies, not just roosting habitat) are detected during the habitat assessment, CDFW shall be notified immediately.

Mitigation Measure Bio-11: Riparian Habitat Mitigation

For permanent impacts to riparian habitat that cannot be avoided, loss of riparian trees shall be mitigated for at a 3:1 ratio and riparian scrub shall be mitigated for at a 2:1 ratio through on-site mitigation. A revegetation plan shall be prepared by a qualified biologist and reviewed by appropriate agencies prior to the removal of existing vegetation. The revegetation plan shall identify the appropriate replanting stock and shall employ the most successful techniques available. The plantings shall be maintained for 5 years and replanted if necessary. All plantings shall have a minimum of 80% survival at the end of 5 years and shall attain 70% cover after 3 years and 75% coverage after 5 years. Permittee is responsible for replacement planting, additional watering, weeding, invasive plant eradication, or any other practice to achieve these requirements. Permittee shall monitor the replacement plants for the aforementioned survival and growth requirements for 5 years after planting. If the on-site mitigation fails, Permittee will be required to fully mitigate the loss of habitat at an off-site location.

Mitigation Measure Bio-12: Minimize Temporary Impacts to Wetlands

Temporary loss of wetlands shall be minimized by utilizing construction equipment from upland berms and levees wherever possible. Vehicular traffic shall be limited to existing or designated transportation routes along upland levees and berms. When constructing temporary crossings, low ground pressure equipment or fiber mats shall be placed across aquatic habitat to maintain subsurface elevations upon removal.

Mitigation Measures for Cultural Resources

Mitigation Measure CR-1: Impacts to Unknown Human Remains

If human remains are found, such remains are subject to the provisions of California Public Resources Health and Safety Code Section 7050.5-7055. The requirements and procedures shall be implemented, including immediately stopping work in the vicinity of the find and notification of the Solano County Coroner. The process for notification of the California NAHC and consultation with the individual(s) identified by the NAHC as the “most likely descendent” is set forth in Section 5097.98 of the California Public Resources Code. Work can restart after the remains have been investigated and appropriate recommendations have been made for the treatment and disposition of the remains.

Mitigation Measures for Hazards and Hazardous Materials

Mitigation Measure HM-1: Emergency Response Training and Response Plan

All personnel involved in the use of hazardous materials shall be trained in emergency response and spill control. Diesel fuel and oil shall be used, stored, and disposed of in accordance with standard protocols for the handling of each hazardous material. Contracts shall require contractors to prepare and make available for review by DWR, a spill prevention and control plan.

Mitigation Measure HM-2: Hazardous Material Clean Up
Appropriate spill response materials and procedures shall be present on site to properly respond to a spill or contamination. Soil and water contaminated by any hazardous materials during construction shall be properly cleaned up and disposed of.

Mitigation Measures for Hydrology and Water Quality
Mitigation Measure WQ-1: Minimize Construction Related Turbidity
To minimize turbidity impacts to water quality, the following BMPs shall be implemented for all phases of the Project:

- A silt curtain or similar turbidity control method shall be utilized outside of the southern breach prior to the start of in-water construction if necessary.
- Silt fences, fiber rolls, or other similar sediment control materials shall be utilized on all exposed soils that may run into water.
- In-water work shall occur during low or incoming tide, where feasible, and excavate towards the island interior from machinery operated from an upland location.
- Except for designated access routes, staging areas, and construction footprint, vegetation shall be left in place and unharmed.
- Upon completion of construction, exposed areas would be seeded with native vegetation.

Statement of No Significant Effect: In accordance with Section 21082.1 of the California Environmental Quality Act, DWR has independently reviewed and analyzed the Initial Study and Mitigated Negative Declaration for the Project. The Initial Study and proposed Mitigated Negative Declaration reflect the independent judgement of DWR. DWR has determined that adoption of a Mitigated Negative Declaration is appropriate and that the preparation of an Environmental Impact Report will not be required. DWR has reviewed and responded to comments (Appendix A)

As the lead agency for the Project, DWR finds that the Project mitigation measures will be implemented as stated in the MND. DWR has adopted a Mitigation Monitoring and Reporting Program to ensure compliance with the required mitigation measures for the Project. With the implementation of these mitigation measures, the Project would have no significant effect on the environment.

I hereby approve these draft documents for the Decker Island Restoration Project for public review.

Dean F. Messer

8/4/16

Dean F. Messer, Chief
Division of Environmental Services

Date

Initial Study

Decker Island Restoration Project

Lead Agency:

Department of Water Resources
Fish Restoration Program

July 2016

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Abbreviations

BAAQMD – Bay Area Air Quality Management District

BiOp – Biological Opinions

BMPs- Best Management Practices

CAP – Clean Air Plan

CEQA – California Environmental Quality Act

CDEC – California Data Exchange Center

CDFW or CDFG – California Department of Fish and Wildlife

CGS – California Geological Survey

CNDDB – California Natural Diversity Database

CNPS – California Native Plant Society

CRHR – California Register of Historic Resources

CVP – Central Valley Project

DIHEP – Decker Island Habitat Enhancement Project

DOC – Department of Conservation

DWR – California Department of Water Resources

FR – Federal Register

GGERP – Greenhouse Gas Emissions Reduction Program

GHG – Greenhouse Gases

HCP – Habitat Conservation Plan

NMFS – National Marine Fisheries Service

NRHP – National Register of Historic Places

RPA – Reasonable and Prudent Alternative

SFBAAB - San Francisco Bay Area Air Basin

SMAQMD - Sacramento Metropolitan Air Quality Management District

SRDWSC – Sacramento River Deep Water Ship Channel

SWP – State Water Project

SWPPP – Storm Water Pollution Prevention Plan

SWRCB – State Water Resource Control Board

USACE – United States Army Corps of Engineers

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

VELB – Valley Elderberry Longhorn Beetle

YSAQMD - Yolo-Solano Air Quality Management District

1 Introduction

1.1 Overview of the Project

The Decker Island Restoration Project (Project) is an approximately 140-acre tidal restoration Project in southern Solano County proposed by DWR (Figure 1). Decker Island was created by the United States Army Corp of Engineers (USACE) during the construction of the Sacramento River Deep Water Ship Channel (SRDWSC) in the early 1900's which cut through a portion of the alluvium deposits of Montezuma Hills. The island is bordered on the west by the SRDWSC and the east and south by Horseshoe Bend. DWR is the CEQA Lead Agency for this Project.

Decker Island falls under three ownerships: the majority of the island (western 473 acres) is owned by D.I. Aggregate Management LLC, the northern tip of 34 acres is owned by the Department of Fish and Wildlife (CDFW), and the eastern 140 acres is owned by DWR.

The Project would include a suite of actions necessary for site preparation, restoration, minimizing or avoiding potential impacts, post-restoration monitoring, and maintenance.

The construction portion of the Project would include:

1. Pre-construction site preparation, including preparing staging areas at the northern and southern ends of the Project site.
2. Lowering of a levee section on the northern perimeter of the Project site.
3. Reconfiguration of remnant berms on the interior of the Project site.
4. Widening of the current breach at the southern end of the Project site.
5. Upland fill placement and chipping.

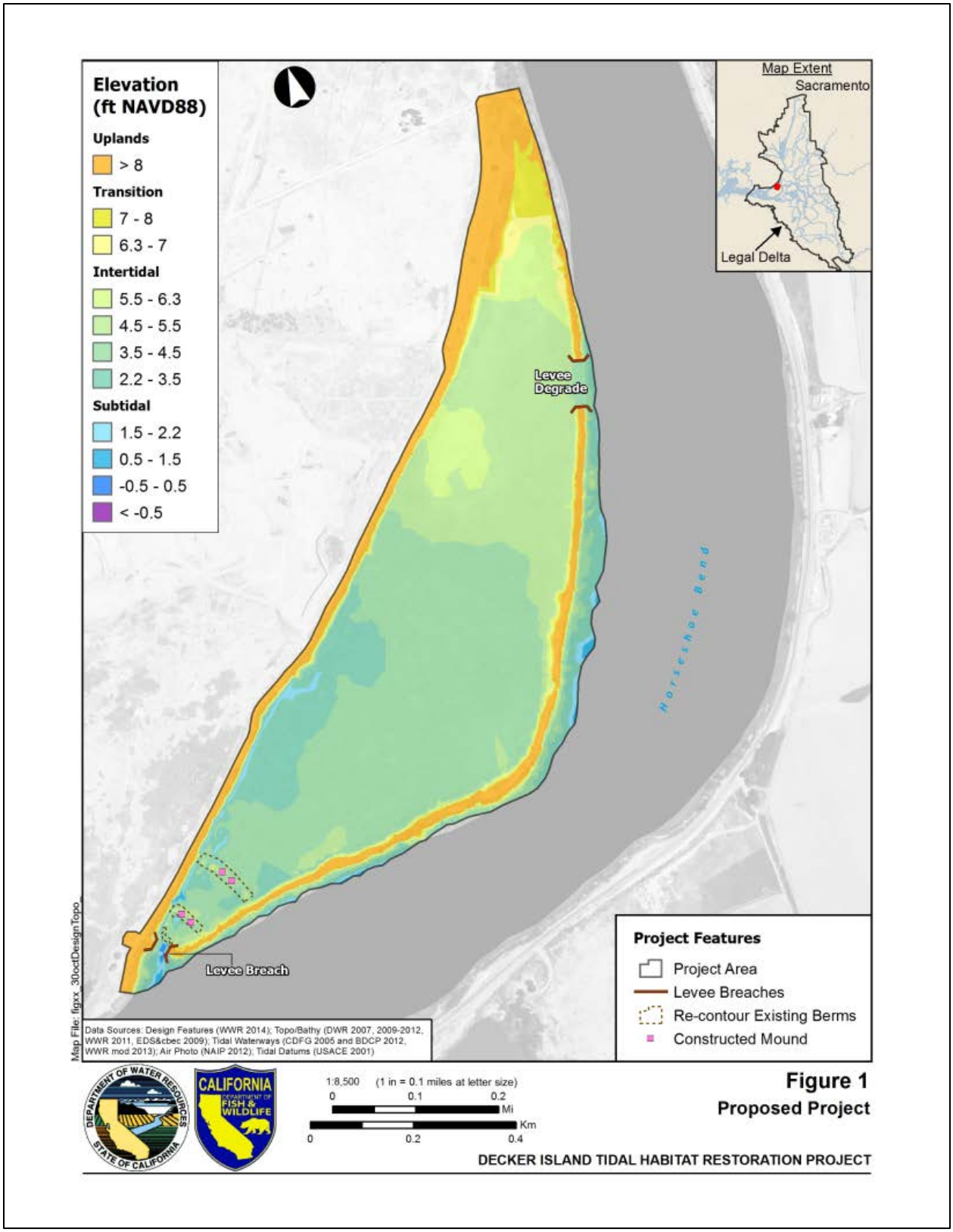

Figure 1. Decker Island Restoration Site Location

1.2 Project Objectives

The Project is intended to partially fulfill the 8,000 acre tidal habitat restoration obligations of DWR contained within Reasonable and Prudent Alternative (RPA) of the U.S. Fish and Wildlife Service (USFWS) Delta Smelt Biological Opinion (BiOp) for long-term coordinated operations of the State Water Project (SWP) and the federal Central Valley Project (CVP) (USFWS 2008). Because restoration of tidal habitat would provide access for salmonid rearing at Decker Island, the Project would also be consistent with RPA I.6.1 of the National Marine Fisheries Service (NMFS) Salmonid BiOp for SWP/CVP operations (NMFS 2009).

The goal of the Project is to restore unrestricted tidal connectivity to the interior of Decker Island to create tidal wetland, associated high marsh, and riparian habitats on the site to benefit native fish species.

The three Project objectives are to:

1. Enhance habitat appropriate for spawning and/or rearing salmonids, Delta Smelt, and other native fish species;
2. Enhance available productivity for native fish within and adjacent to the restoration site; and
3. Provide connectivity to the marsh plain for migrating salmonids.

Achieving project objectives would result in benefits to special status species in and around the project area. Enhanced habitat by providing a larger tidal regime would expand emergent marsh habitat for use by Delta Smelt (*Hypomesus transpacificus*) and juvenile salmonids as well as other listed species like California black rail (*Rallus jamaicensis cotumiculus*) and tricolored blackbird (*Agelaius tricolor*). Productivity from increased emergent marsh, and associated high marsh and floodplain, would provide food web benefits to rearing salmonids, Delta Smelt, and Longfin Smelt (*Spirinchus thaleichthys*).

1.3 Project Background and History

Decker Island is part of the historic Central Delta's system of tidal sloughs and islands; tidal freshwater emergent wetlands that were dominated by a system of tules, willows, and other bulrush. These habitats were inundated by daily fluctuations in tidal level, completely flooded during spring tides, and covered in several feet of water during months of high river outflows. Compared to the North and South Delta, marshes in the Central Delta had a higher density of sloughs that provided an interface for nutrient exchange (SFEI 2014).

Prior to construction of the SRDWSC, the Project area was a tidal marsh at the terminus of an intermittent stream draining the Montezuma Hills. In the early 1900s USACE constructed the SRDWSC and placed over 30 million tons of dredge spoils on the marsh surface which created the western section of the island. The eastern section of the island, which is the Project area, was leveed off from the dredge disposal area and farmed for corn (Thompson 1957). Farming practices continued until the late 1960s; by 1968 Decker Island was classified as

miscellaneous/open space. Tidal sloughs were utilized as agricultural ditches and a culvert was installed at the southern end of the Project area. An upland area near a drainage swale became the location of housing structures and farming equipment. The 140 acre Project area changed ownership to the Sacramento Yolo Port District where it has since been classified as open space and agriculture. In 2015 ownership was transferred to DWR.

1.4 Human Land Use and Infrastructure

Farming infrastructure still remains on Decker Island today. Prior to 1990, a water control structure on the southwestern tip of the island eroded away, leaving only the open culvert and surrounding rip-rap, which allowed for muted tidal access to the site. Two small dikes constructed on the southwestern section of the Project area remain with signs of erosion. Large farming equipment and vehicles are still found on the upland area of the island.

DI Aggregate Inc., a commercial sand and gravel mining company that owns the western section of Decker Island, maintains a fence and levee that bisects Decker Island into eastern and western properties. The levee starts on the northeast section of the island where a sandy beach and boat dock are utilized for offloading personnel, equipment, supplies, and cattle. For 1.25 miles the levee parallels the property line to the southwest. DI Aggregate also leases cattle to graze their parcel of the island.

A 34 acre CDFW enhancement site on the norther tip of Decker Island was constructed to enhance available fish habitat and provide material for levee improvements on Sherman and Twitchell Islands. This site was constructed in two phases; partially constructed in 2000 and finished in 2004. While constructed with variable topography to support a diversity of habitats, the channels within the site have become heavily choked with invasive vegetation.

1.5 Public Use

There is no public use or public access currently on the Project site or the DI Aggregate property. The public has access to the CDFW enhancement site through the breach and landing beaches. The site is regularly visited by fishermen.

1.6 Nearby Municipal Areas

The City of Rio Vista, Antioch, and Oakley are located approximately 5 miles north, southwest, and south of Decker Island, respectively. There are several large metropolitan areas within 30 miles of Decker Island including Concord, Martinez, Vallejo, Fairfield, and Stockton.

1.7 Regulatory Requirements, Permits, and Approvals

DWR has the responsibility to ensure that all requirements of CEQA and other applicable regulations are met. Other potential permitting requirements for this Project are listed below:

Federal

- Permit pursuant to Section 404 of the Federal Clean Water Act through USACE
- Section 7 consultation with USFWS and NMFS to comply with the Federal Endangered Species Act, initiated through USACE

- Section 106 consultation with the State Historic Preservation Officer to comply with the National Historic Preservation Act, initiated through USACE
- Section 408 Permission from USACE for alteration of a public works, initiated through Central Valley Flood Protection Board
- National Environmental Policy Act Environmental Assessment and Findings of No Significant Impact

State

- Streambed Alteration Agreement from CDFW pursuant to Section 1602 of the California Fish and Game Code
- Incidental Take Permit from CDFW pursuant to Section 2081(b) of the California Fish and Game Code and Title 14 Section 783.4 of the California Code of Regulations
- Water Quality Certification from the Regional Water Quality Control Board pursuant to Section 401 of the Federal Clean Water Act
- Construction General Permit to comply with National Pollutant Discharge Elimination System standards from the Regional Water Quality Control Board pursuant to Section 402 of the Clean Water Act
- Notification of use of State Lands, California State Lands Commission, Memorandum of Understanding dated October 19, 1979 between the State Lands Commission and DWR

Regional/Local

- Certification of Consistency with the Delta Plan from the Delta Stewardship Council
- Encroachment Permit, Central Valley Flood Protection Board, for construction and encroachment on the levee

2 Project Descriptions

The proposed Decker Island Restoration Project includes several project elements which would reestablish tidal connections to the historic marsh as well as enhance existing marsh habitat on the Project site. The project elements include:

- Lowering of northern levee. A section of the northern levee would be lowered to create high marsh habitat as well as allow high tide waters and flood flows to enter the site.
- Berm reconfiguration. The existing cross berms would be reconfigured to improve tidal connectivity between the breach and northern marsh plain and to create habitat mounds that may act as refugia.
- Excavation of southern breach. The southern breach would be created by excavating the area of the current culvert and rock weir to open the site to full tidal action.

Lowering of Northern Levee

The Project site only receives muted tidal waters from the southern culvert and weir. To enable the site to act as a floodplain and receive flushing flows during high water events and during high tides, a 300 foot section of levee on the northeast portion of the site would be lowered to match the adjacent interior site elevation. Flood flows across the island during high water events should help flush out invasive aquatic plant species and scour existing channels.

Construction Methods

Access to the levee lowering site would occur through upland areas of the Project site or by barge. The levee site would be cleared and grubbed prior to excavation. Excavation of the levee lowering site would be done in two stages. Stage 1 of excavation would lower the levee to 6.8 feet NAVD88 by removing approximately 700 cubic yards of fill from the top of the levee. Some of this levee fill material would be used to stabilize access to the southern breach, some may be used to create access crossings for the berms, and the rest would be spread in the upland area. Stage 2 of excavation would involve removing the remaining fill above site elevations (4.9 feet NAVD88), still holding back the tidal waters, to the upland area. Upon completion, this section of levee would be lowered and smoothed to match the grade on the interior of the Project site. Low ground pressure equipment would most likely be required for construction of this Project feature.

Lowering of the northern levee would excavate a total of 1,900 cubic yards of fill, temporarily disturb 18,659 square feet (0.43 acres) of wetlands. The formally upland portions of the levee would be converted to wetland.

Berm Reconfiguration

There are three berms running parallel to the southwest levee/breach location. These berms were former levees on the southern portion of the Project site. Currently, water flows around the berms on the northern edge and through the berms via small eroded sections, which restricts and directs water flow to the edge of the site. Breaching and reconfiguring the berms would allow tidal waters through the berms, help eliminate perched water, hinder mosquito reproduction, and increase access to the marsh plain by aquatic organisms. The berm closest to the breach (Berm 1) would be lowered to match adjacent marsh plain elevations. The remaining two berms (Berms 2 and 3) would be reconfigured.

Construction Methods
The berms would be accessed by using an existing road on the neighboring property. Two temporary earthen crossings would be built over the existing channel for equipment to access the berms. Fill material for the crossings would come from the Stage 1 levee lowering or from the southern breach excavation. Each crossing would contain a culvert to allow water to continue to pass through the crossing (Appendix B). Berms would be cleared of vegetation. Vegetation debris would be either chipped in place or hauled to the upland portions of the site where the chips would be spread. Equipment, such as a low ground pressure excavator, would be used to excavate fill from the berm down to marsh plain elevations. Berm 1 excavated material (206 cubic yards) would be moved to the upland areas of the site as the entire berm would be graded to marsh plain elevations. Excavated material from Berms 2 and 3 (231 cubic yards) would be placed on top of the remaining berm and be used to create higher marsh habitat mounds where they would not impede water flow. Any excess excavated berm material may be used to fill or block a shallow swale along the southern portion of the wetlands making it level with the marsh plain. Once berms have been modified, the access crossings would be removed, the area would be returned to preconstruction elevations, and the fill would be spread in an upland areas. The temporary crossing culverts would be removed from the island.

Reconfiguring the berms would require excavation of 437 cubic yards of fill and temporary disturbance of 0.5 acres of wetland.

<u>Excavation of Southern Breach</u>
Water currently enters the Project site over and through an eroded rip rap weir with an 18” culvert at the southwest edge of the property. The weir is approximately 15 feet wide (at 4.3 ft. NAVD88). The culvert and rock weir would be removed along with the adjoining levee to the west to create a breach approximately 130 feet wide (Appendix B) at the top and approximately 40 feet wide at the bottom. The breach will contain a bench area at 4 feet NAVD88 which approximately matches exterior marsh plain elevations. A transition area leading to the deeper portion of the breach would be excavated both inside and outside the Project site. The transition area would slope from existing elevations down to the bottom of the breach at 0 feet NAVD88. Removing the weir, culvert, transition area, and levee would allow full tidal action within the Project site.

Construction Methods
An existing road on the neighboring property would be used to access the southwest portion of the Project site. The levee leading to the weir would be cleared of vegetation. Vegetation debris would either be chipped in place or removed to the upland portion of the site where the chips would be spread. Fill material may be removed down to 6 foot elevations and used to create the temporary crossings for the berms. Land based excavation equipment such as an excavator would be used to remove material. The excavator would start work from the northern side of the rock weir back towards the roadway while excavating. Debris such as the culvert would be hauled away and disposed of. Rip rap in the weir may be reused onsite, if suitable, or hauled away and disposed of. Material removed from the breach site and transition area would be

either placed on upland areas adjacent to the breach or transported via the existing roadway to the northeast portion of the site and place d in upland areas.

Clearing, placement of soil, excavation of the transition area, and excavation of the breach would result in the removal of 2,056 cubic yards of material and the temporary disturbance of 0.04 acres of wetlands.

Staging Areas and Upland Fill Placement

Fill from the southern breach and the levee lowering would be spread in the upland portions of the Project site. Upland areas may include areas immediately adjacent to the project feature but much of the fill would be placed in the uplands on the northeast portion of the Project site. The upland area would also contain one of two staging areas. The second staging area would be placed in the upland area of the adjoining property. Material necessary to create ramps for the second staging area (620 cubic yard) would come from the adjacent upland area.

Construction Timeline

Table 1. Construction activity and estimated duration

Construction Element	**Estimated duration**
Create staging areas and other site preparation	3 day
Northern levee clearing and grubbing	2 day
Breach vegetation clearing	2 day
Install turbidity control (if needed)	2 day
Levee lowering/Levee Degrade	7 days
Dispose excavated material to high ground and place at temporary turn-around area	4 days
Create berm access crossings	2 days
Berm vegetation clearing	2 day
Reconfigure berms	3 days
Excavate southern breach	7 days
Remove crossing culvert and haul materials to high ground area	4 days
Reinstall fence and remove silt curtains	2 days
Remove staging areas	2 days

Future Conditions

Habitats present on the Project site are visualized in Table 2 and Figure 2 and are separated into three timeframes to show the impacts from construction and restoration: Existing Conditions, As-Built Conditions, and Future Conditions. Existing conditions describe the habitat present on Decker Island before restoration; that habitat is dominated by muted tidal wetland and grassland, with fringes of riparian.

As-Built conditions describe habitat conditions immediately following Project completion. The tidal prism would increase from mean high water (5.8 feet NAVD88) under muted conditions to mean higher high water (6.3 feet NAVD88) within the Project area, which converts 90.2 acres of muted tidal habitat and 19.3 acres of grassland to tidal wetland. Temporary construction impacts at the berms, southern breach, and levee degrade would result in 1.5 acres of unvegetated tidal mudflat.

Future habitat conditions describe the habitat 2 years after restoration when the 1.5 acres of tidal mudflat from temporary impacts are expected to have revegetated with emergent vegetation. This is expected to occur quickly as temporarily impact areas are located within existing emergent vegetation. Restoration would result in a net increase of 22 acres of tidal wetland habitat.

Table 2. Impacts and future habitat conditions for the Decker Island Restoration Project. The top section of the table separates impacts into specific habitat classifications, while the bottom section is separated by more generalized habitat types.

Habitat Type	Classification	Existing (acres)	As-Built (acres)	Future (acres)	Net Change (acres)	Net Habitat Change
Aquatic[1]	Muted tidal waters, below MHW	1.5	0	0.0	-1.5	-1.5
	Tidal waters, below MHW	11.8	11.8	11.8	0.0	
	Tidal waters, between MHW and MHHW	0.3	0.3	0.3	0.0	
Wetlands[2]	Muted tidal freshwater perennial emergent wetland	90.2	0.0	0.0	-90.2[4]	22
	Tidal mudflat	0.0	1.5	0.0	0.0	
	Tidal freshwater perennial emergent wetland	0.0	110.7	112.2	112.2	
Uplands[3]	Fremont's Cottonwood Forest	1.5	1.4	1.4	-0.1	-20.5
	Riparian Scrub	6.1	5.0	5.0	-1.1	
	Grassland	41.7	22.4	22.4	-19.3	

[1] Aquatic – subtidal or tidal water habitat that lacks wetland vegetation

[2] Wetland – subtidal or tidal habitat with established wetland vegetation

[3] Upland – all habitat classifications above the mean higher high water elevation (6.3 feet NAVD88)

[4] This represents a reclassification of wetland habitat from muted to tidal wetland; it is not a loss of wetland habitat.

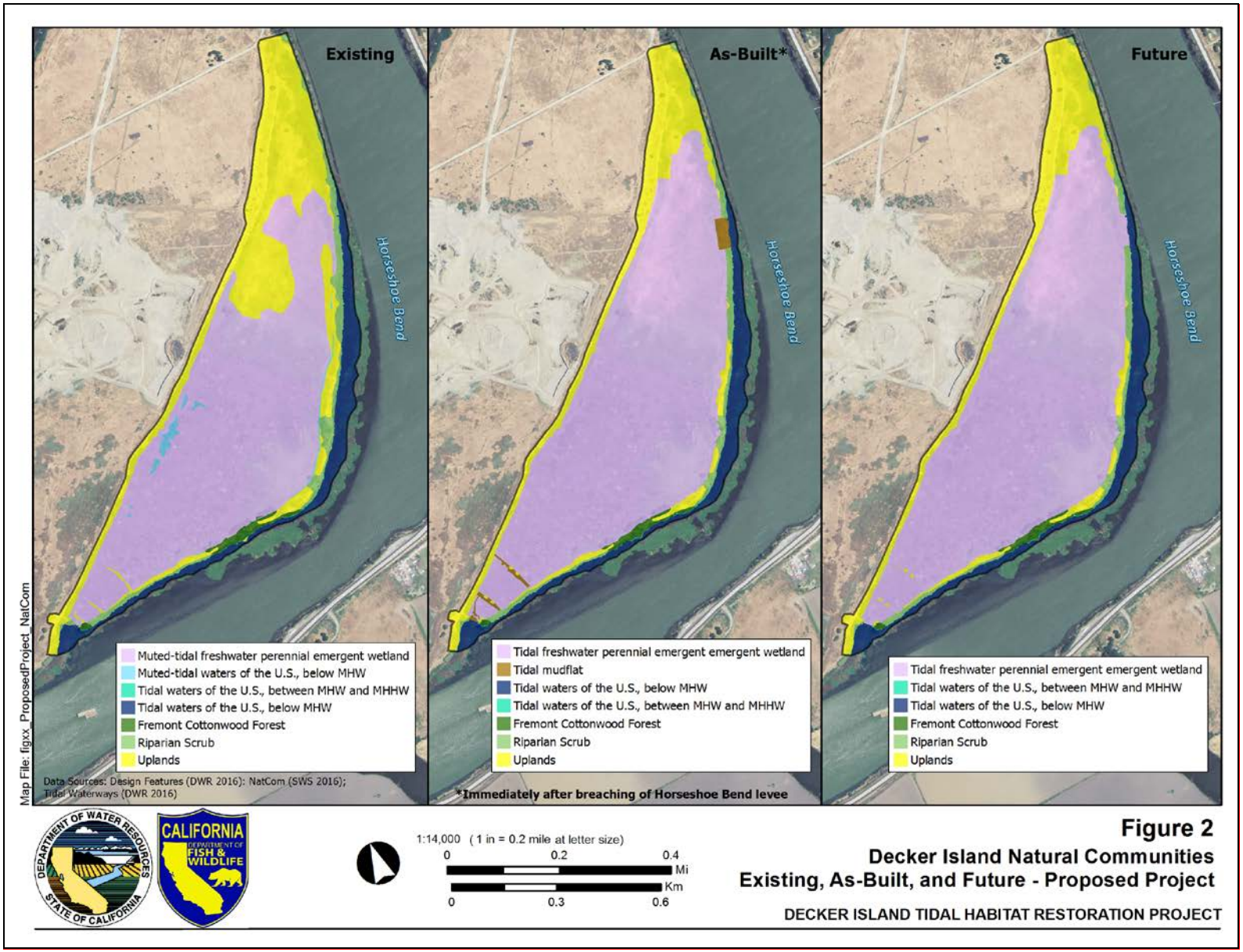

Figure 2. Current and anticipated as-built and future conditions with associated natural communities.

3 Environmental Checklist

Environmental Factors Potentially Affected:
The environmental factors checked below would be potentially affected by this project as indicated by the checklist on the following pages.

-	Aesthetics	-	Agriculture and Forestry Resources	-	Air Quality
✓	Biological Resources	✓	Cultural Resources	-	Geology and Soils
-	Greenhouse Gas Emissions	✓	Hazards and Hazardous Materials	✓	Hydrology and Water Quality
-	Land Use and Planning	-	Mineral Resources	-	Noise
-	Population and Housing	-	Public Services	-	Recreation
-	Transportation and Traffic	-	Utilities and Service Systems	✓	Mandatory Findings of Significance

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☑ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Dean L. M 8/4/16

Signature Date

3.1 Aesthetics

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?			x	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?			x	
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			x	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				x

3.1.1 Environmental Setting

The Project site is visible by boat traveling along the adjacent waterbody of Horseshoe Bend, though most views are blocked by levees and emergent vegetation. The Project site is also visible by vehicles traveling along Highway 160 (Figure 3). The project area is approximately 0.20 miles from Highway 160.

3.1.2 Discussion

a) Have a substantial adverse effect on a scenic vista?

Less-than-significant

Construction equipment may be visible from within Horseshoe Bend or from Highway 160. Most construction activities within the interior of the site though would be obscured by the vegetated levee; however, some activities like breaching of the levee would likely be directly visible. These visible construction activities encompass a relatively small area and would be completed within 1 week.

After construction, the views at the breach and levee degrade would change from vegetated levees to open water and emergent marsh. Most of the island that is visible from the surrounding waters and Highway 160 will remain unchanged.

Construction activities would be temporary and equipment used would be similar to equipment that regularly operates throughout the Delta and on adjacent properties on Decker Island. The

size and location of the breach and levee degrade combined with already heavily vegetated levees would limit visibility of construction equipment from a boat or vehicle. This impact would be less than significant.

Figure 3. View of the southern end of Decker Island from Highway 160 on Sherman Island.

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

Less-than-significant

Highway 160 is officially designated as a state scenic highway from the Contra Costa County line to the southern city limit of Sacramento. The eastern portion of the project site, which is limited mostly to vegetated levees, is visible from Highway 160. The construction of the Project would result in the removal of 1 tree (see Mitigation Measure Bio-11) and the lowering of a 300 foot portion of the levee. Both of these activities would be obscured by existing emergent vegetation and trees, so the scenic views would not noticeably change from existing conditions.

The changes that would occur as a result of the Project would be difficult to view from the highway due to distance and existing vegetation. Post-construction conditions would be similar

to the surrounding area with open water, marsh vegetation, and riparian levees. In addition, Mitigation Measure Bio-11 would replant trees impacted by construction activities. As the existing scenic resources would not noticeably change, impacts would be less than significant.

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

Less-than-significant

As noted in sections (a) and (b) above, the Proposed Project would not result in substantial changes to the existing visual character of the site and impacts; therefore, impacts would be less-than-significant.

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

No impact

No lighting is proposed for the Project and all work would occur during the daytime; therefore, there would be no impact.

3.2 Agricultural & Forest Resources

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
(a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland)--as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency--to non-agricultural use?				x
(b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				x
(c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526?				x
(d) Resulting in the loss of forest land or conversion of forest land to non-forest use?				x
(e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				x

Environmental Setting

Decker Island originally was a small, narrow area of marsh habitat separating Horseshoe Bend from an oxbow-like lake at the base of the Montezuma Hills. Following successive Sacramento River channelization projects in the early- and mid-1900s, dredge spoils had built upland habitat on the western portion of Decker Island. Levees were eventually constructed around Project area at which point it was farmed for row crops until the late 1960s. In 1968 Decker Island was classified as miscellaneous/open space and was no longer farmed.

Discussion

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland)--as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency--to non-agricultural use?

No impact

There is no farmland as defined by the California Resources Agency or Solano County within the Project area; therefore, there would be no impact.

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

No impact

The Project area is not zoned as agriculture, nor is it protected under a Williamson Act contract; therefore, there would be no impact.

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

No impact

The Project area is not zoned as agriculture or timberland; therefore, there would be no impact.

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

No impact

No forest lands are located within the Project area; therefore, there would be no impact.

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

No impact

The Project area is not zoned for agriculture; therefore, there would be no impact.

3.3 Air Quality

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
(a) Conflict with or obstruct implementation of the applicable air quality plan?			x	
(b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			x	
(c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?			x	
(d) Expose sensitive receptors to substantial pollutant concentrations?				x
(e) Create objectionable odors affecting a substantial number of people?				x

3.3.1 Environmental Setting

Decker Island is in the San Francisco Bay Area Air Basin (SFBAAB) managed by the Bay Area Air Quality Management District (BAAQMD); it is also immediately adjacent to the Sacramento Valley Air Basin and air sub-basins managed by the Yolo-Solano Air Quality Management District (YSAQMD) and the Sacramento Metropolitan Air Quality Management District (SMAQMD). The SFBAAB is divided into eleven sub-regions; Decker Island is within the Carquinez Strait sub-region, an area of several industrial facilities and the location of a major interstate highway. Summer temperatures can reach 90^0 F, winter temperatures may drop to the high 30's, and prevailing winds flow eastward. Pollutants tend to concentrate within the sub-region when winds flow westward from the Central Valley.

The air quality monitoring station at Vallejo collects local data for criteria pollutants $PM_{2.5}$, SO_2, NO_2, and CO. Monitoring stations at Vallejo, Fairfield, and Vacaville collect data on ozone, and the Vacaville station collects only PM_{10} data. The Vallejo and Fairfield stations are part of the BAAQMD network of monitoring stations, but the Vacaville station is within the YSAQMD station network; all monitoring stations however are within Solano County. No air quality data to

ascertain the attainment status of individual criteria pollutants is derived from a SMAQMD air quality monitoring station.

Table 3 compares the Federal and State attainment status of each criteria pollutant for the BAAQMD and YSAQMD. Both districts are non-attainment for state and federal ozone standards, and the state PM_{10} standards. The BAAQMD has designations of non-attainment for the state $PM_{2.5}$ annual standard and the Federal $PM_{2.5}$ 24-hour standard pending submission of a redesignation request by the district.

A court order currently prevents the BAAQMD from recommending the use of significance thresholds adopted by the agency in June 2010. Based on the fact stated earlier that Decker Island is within Solano County and all air quality monitoring data is acquired from stations located within the county and particularly the YSAQMD's Vacaville station as the exclusive PM_{10} monitoring station for the area, the lead agency has reasoned to use the YSAQMD significance thresholds adopted in 2007 for this significance analysis.

Table 3. Federal and State attainment status for air quality districts adjacent to Decker Island.

Criteria Pollutant		**BAAQMD**	**YSAQMD**	**BAAQMD**	**YSAQMD**
		State Ambient Air Quality Standards		**Federal Ambient Air Quality Standards**	
Ozone	1 Hr	N	N	---	N
	8 Hr	N	N	N	N
Carbon Monoxide	1 Hr	A	A	A	A
	8 Hr	A	A	A	A
Nitrogen Dioxide	1 Hr	A	A	U	A
	Annual Mean	A	A	A	A
Sulfur Dioxide	1 Hr	A	A	A	A
	24 Hr	A	A	A	A
	Annual Mean	---	---	A	A
PM_{10}	24 Hr	N	N	U	U
	Annual Mean	N	N	---	---
$PM_{2.5}$	24 Hr	---	---	N	U
	Annual Mean	N	U	U/A	U
U = Unclassified A = Attainment N = Nonattainment --- = No applicable standard or no assigned status					

The pollutants of concern include precursors to ozone, which are reactive organic gases (ROG), nitrogen oxides (NO_X), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), particulate matter less than 10 micrometers in diameter (PM_{10}), and carbon monoxide (CO). The following thresholds apply to both construction and operational impacts:

- ROG: 10 tons/year (57.8 pounds/day)
- NOx: 10 tons/year (57.8 pounds/day)
- PM10: 80 pounds/day
- CO: 20 parts per million/hour; 9.0 part per million/8 hours

ROG and NO_X are represented in tons/year according to the 2007 YSAQMD CEQA Handbook; however, since this project would last for less than one year, a conversion to pounds per day is included for comparative purposes. The Environmental Protection Agency has not yet officially proposed a PM2.5 designation for YSAQMD.

a) Conflict with or obstruct implementation of the applicable air quality plan?
Less than significant
Work proposed for the Project would not conflict with implementation of any applicable air quality plans for the Sacramento Valley or any adjacent Air Basins. The construction would last up to two months, and while construction equipment emits ozone precursors, such emissions are included in the emission inventory that is the basis for regional air quality plans. Therefore, construction emissions are not expected to impede attainment or maintenance of ozone standards in the area. To avoid impacts, a strict no-idle of heavy equipment policy would be enforced. Additionally, if wind is forecasted to be greater than 20 miles per hour on a given day, construction work will be postponed in order to avoid the creation of substantial dust (PM10). Impacts would be less than significant.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?
Less than significant
The major emissions from this project would include:

- Fugitive dust (PM_{10} and $PM_{2.5}$) primarily from earth-moving activities;
- Combustion emissions of criteria air pollutants (ROG, NO_X, CO, carbon dioxide, PM_{10}, and $PM_{2.5}$) primarily from operation of loaders, excavators, and barges for transportation of equipment.

Appendix C includes calculations from the Road Construction Emissions Model Version 8.1.0 and a detailed explanation of the assumptions and rationale used for the calculations. Table 4 and Table 5 below summarize the maximum-daily and Project-total emissions for each phase of the Project.

Table 4. Maximum Daily Air Pollutant Emissions (in pounds per day for an 8 hour work day)

Construction Phase	ROG	CO	NOx	PM_{10}	$PM_{2.5}$	SOx
Mobilization	0.55	3.08	20.14	0.62	0.60	2.67
Site Preparation	6.09	32.16	60.13	14.97	5.29	0.60
Construction	5.17	27.45	47.00	23.97	6.80	0.58
Demobilization	0.55	3.08	20.14	0.62	0.60	2.67

Table 5. Total Air Pollutant Emissions (pounds)

Construction Phase	ROG	CO	NOx	PM_{10}	$PM_{2.5}$	SOx
Mobilization	0.55	3.08	20.14	0.62	0.60	2.67
Site Preparation	58.89	331.31	633.80	130.98	47.42	1.27
Construction	52.90	290.28	485.82	137.41	45.89	1.09
Demobilization	0.55	3.08	20.14	0.62	0.60	2.67
Project Total (pounds)	**112.90**	**627.76**	**1159.89**	**269.63**	**94.51**	**7.70**
Project Total (tons)	**0.06**	**0.31**	**0.58**	**0.13**	**0.05**	**0.00**

The model calculations ascertain no criteria air pollutant would exceed any threshold of significance. NO_X exceeds 57.8 pounds/day; however, the actual threshold is 10 tons/year which the projected 0.58 tons/year is under. CO is difficult to compare as the model calculates in pounds/day, not parts per million/hour; however, this is not expected to be an issue as this project uses diesel vehicles which create relatively very little CO compared to gas vehicles and the project site is not near any traffic that will lead to a significant increase in the concentration of CO in the area. Impacts would be less than significant.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

Less than significant

The model calculations ascertain no criteria air pollutant would exceed any threshold of significance. NO_X exceeds 57.8 pounds/day; however, the actual threshold is 10 tons/year which the projected 0.58 tons/year is under. CO is difficult to compare as the model calculates in pounds/day, not parts per million/hour; however, this is not expected to be an issue as this project uses diesel vehicles which create relatively very little CO compared to gas vehicles and the project site is not near any traffic that will lead to a significant increase in the concentration of CO in the area. Impacts would be less than significant.

While the Project is not expected to have cumulatively considerable impacts for criteria pollutants in non-attainment, the following BMPs shall be implemented during Project construction to minimize any potential for significant impacts:

- Haul trucks transporting soil, sand, debris, or other loose material off site shall be covered;
- Vehicle speeds on unpaved roads shall be limited to 15 miles per hour;
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]);
- Construction equipment shall be maintained and properly tuned in accordance with manufacturer‘s specifications. All equipment shall be checked by a certified visible emissions evaluator;
- Trucks and equipment, including their tires, shall be washed off prior to leaving the site.

- All contractors shall use equipment that meets the California Air Resource Board's most recent certification standard for off-road heavy duty diesel engines.

d) Expose sensitive receptors to substantial pollutant concentrations?
No impact
There are no sensitive receptors in the Project area. Decker Island is more than 10 miles removed from the nearest populated area. There would be no impact.

e) Create objectionable odors affecting a substantial number of people?
No impact
There are no sensitive receptors in the Project area. Decker Island is more than 10 miles removed from the nearest populated area. There would be no impact.

3.4 Biological Resources

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		x		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?		x		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		x		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		x		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				x
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				x

3.4.1 Environmental Setting

The sections below outline the habitats, plants, fish, and wildlife species with potential to be found on Decker Island. See Page 63 for a discussion of the potential impacts to Biological Resources.

3.4.1.1 Habitat Types

The Project area contains eight primary vegetation types (Table 6), with the majority being wetland consisting of Arid West Freshwater Emergent Marsh. See below for a description of each community.

Table 6. Vegetation types in the Decker Island Project area.

Vegetation Type	Area (acres)	Percent of Total Survey Area
Upland		
California Annual Forb/Grass Vegetation	34.1	23
Riparian Scrub	7.2	5
Himalayan Blackberry Brambles (*Rubus armeniacus* Semi-Natural Shrubland Stands)	3.1	2
Fremont Cottonwood Forest (*Populus fremontii* Forest Alliance)	2.5	2
Wetland		
Arid West Freshwater Emergent Marsh	80.3	54
Barnyard Grass Patches (*Echinochloa crus-galli* Provisional Semi-Natural Herbaceous Stands)	17.6	12
Freshwater Aquatic Vegetation	1.2	1
Creeping Rye Grass Turfs (*Leymus triticoides* Herbaceous Alliance)	0.5	0.4
Open Water	**1.0**	**1**
Total	**147.5**	**100%**

Uplands

<u>California Annual Forb/Grass Vegetation</u>

California Annual Forb Grassland is the second largest community on the Project site and is almost predominantly located on the higher elevation northern half of the island. This community is dominated by naturalized and nonnative grasses and forbs like Bermuda grass (*Cynodon dactylon*) horsetail (*Equisetum arvense*), fennel (*Foeniculum vulgare*), and spotted knapweed (*Centaurea stoebe subs. Micranthos*). This habitat is important to coyote (*Canis latrans*), western fence lizard (*Sceloporus occidentalis*), and birds like song sparrow (*Melospiza melodia*), western meadowlark (*Sturnella neglecta*), and red-tailed hawk (*Buteo jamaicensis*) to name a few.

Riparian Scrub/Fremont Cottonwood Forest

The Riparian Scrub and Fremont Cottonwood Forest occurs along the higher elevation margins of aquatic and wetland habitat and on the upland portions of the levees. The majority of the riparian community is riparian scrub and is dominated by California rose (*Rosa californica*) and sandbar willow (*Salix exigua*). Also found are Pacific willow (*Salix lasiandra* var. *lasiandra*), buttonbush (*Cephalanthus occidentalis*), blue elderberry (*Sambucus nigra s*ubsp*. cerulea*), California wild grape (*Vitis californica*), Northern California black walnut (*Juglans hindsii*), white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* subsp. *fremontii*). An approximately 750 foot long portion of levee at the southern end of the Project area (Figure 4 and Figure 9) is dominated by numerous large (60-70 feet tall) Fremont Cottonwood trees. The Fremont Cottonwood Forest contains a rookery of great blue herons; a February 2016 survey by CDFW employees counted 27 active nests within the Fremont Cottonwood Forest.

The riparian community is a transition zone between aquatic and terrestrial habitats. Riparian communities generally provide habitat for invertebrates (e.g., valley elderberry longhorn beetle); basking, overwintering, and nesting habitat for reptiles (e.g., western pond turtle); nesting, foraging, and roosting habitat for birds (e.g., Northern Harrier, Swainson's Hawk, White-tailed Kite, Yellow Warbler, Yellow-breasted Chat, Song Sparrow, Least Bell's Vireo); roosting and foraging habitat for mammals (e.g., western red bat); and shaded cover and source of terrestrial insects for fish.

Figure 4. Fremont Cottonwood forest located on the southern end of the Project site. Pictured is a Great Blue Heron rookery; a February 2016 survey by CDFW employees observed 27 active nests.

Himalayan Blackberry Brambles

Himalayan Blackberry Brambles (*Rubus armeniacus*) occur on the internal berms and exterior levees of Project site (Figure 5 and Figure 9). Blackberries are common along regularly disturbed areas, like levees, and are found in association with wild rose and riparian trees like Fremont Cottonwood (*Populus fremontii*). Himalayan blackberry provides important habitat for nesting birds and cover for smaller mammals from predators.

Figure 5. Himalayan Blackberry Brambles at the southern end of the Project site. Photograph was taken via aerial drone and is facing south into Horseshoe Bend. Blackberries are seen here growing along the internal berms, exterior levees along horseshoe bend, and on the cross levee between the Project site and the DI Aggregate property to the right.

Wetland

Arid West Freshwater Emergent Marsh/Freshwater Aquatic Vegetation

Arid West Freshwater Emergent Marsh occurs on over half of the Project site. The eroded culvert at the southern end of the Project site allows for muted tidal water exchange onto the island, which allowed for tules (*Schoenoplectus acutus, S. californicus*) and cattails (*Typha sp*.) to establish at intertidal and subtidal elevations (Figure 6). Freshwater aquatic vegetation occurs on the waterside of the Project area in Horseshoe Bend (Figure 7 and Figure 9). This habitat is comprised of submerged aquatic vegetation (E.g., *Egeria densa, Myriophyllum spicatum*), floating aquatic vegetation (E.g., *Ludwigia sp*., *Eichhornia crassipes*), and emergent vegetation (*S. acutus, S. californicus*).

Freshwater emergent marsh and other aquatic vegetation allows for cooler water temperatures in water bodies through shading and evapotranspiration and provides important ecological functions like oxygen production, primary and secondary productivity, cover for smaller fish species, and nesting habitat for birds. These habitats are beneficial to nesting birds, like

tricolored blackbird (Agelaius tricolor), beaver (*Castor canadensis*), river otters (Lontra *canadensis*), giant garter snake (*Thamnophis gigas*), and fish (E.g., Bluegill (*Lepomis macrochirus*), Largemouth Bass (*Micropterus salmoides*)).

Figure 6. Picture taken of the historic channel located on the southwestern side of the Project site. The photographer was standing on the cross levee and facing east into the Project site. The channel is connected to the culvert at the southern end of the Project site.

Figure 7. Freshwater aquatic vegetation located on the waterside of the Project site within Horseshoe Bend. Visible in the foreground are the invasive *Ludwigia* sp. and native pennywort (Hydrocotyle sp.). Visible in the background are tules (*Schoenoplectus* spp.).

Barnyard Grass Patches

Barnyard grass (Echinochloa spp.) patches are found towards the higher elevation marsh plains throughout the Project site (Figure 8 and Figure 9). Often found in association with cocklebur (*Xanthium* sp.) and buckwheat (*Fallopia* sp.), barnyard grass in indicative of regularly inundated fields, streams, and terraces. Barnyard grass patches on Decker Island are inundated during high tides and subsequently drain at low tide. Barnyard grass patches is an important habitat for waterfowl, rodents, and as foraging habitat for predatory birds.

Figure 8. Barnyard grass patches in the higher elevation wetland habitat. The standing water indicates a lower elevation hole that is regularly wetted during high tide.

Creeping Rye Grass Turfs

There is a small area of creeping ryegrass (*Leymus triticoides*) located on the western side of the Project area adjacent to the cross levee (Figure 9). This habitat is associated with poorly drained floodplains and is likely the result of a low spot between adjacent upland and wetland habitat.

Open Water

Aquatic open water habitat in the Project area is limited to a historic channel on the southwestern side of the Project site. The channel is approximately 10 feet across and travels about a half mile into the Project site before spreading out into a larger pools (Figure 6). It is sparsely vegetated, though limited floating aquatic vegetation has been observed during summer months. Fish commonly found in this open water habitat include Striped Bass (*Morone saxatilis*), white catfish (*Ameiurus catus*), common carp (*Cyprinus carpio*), and largemouth bass (*Micropterus salmoides*).

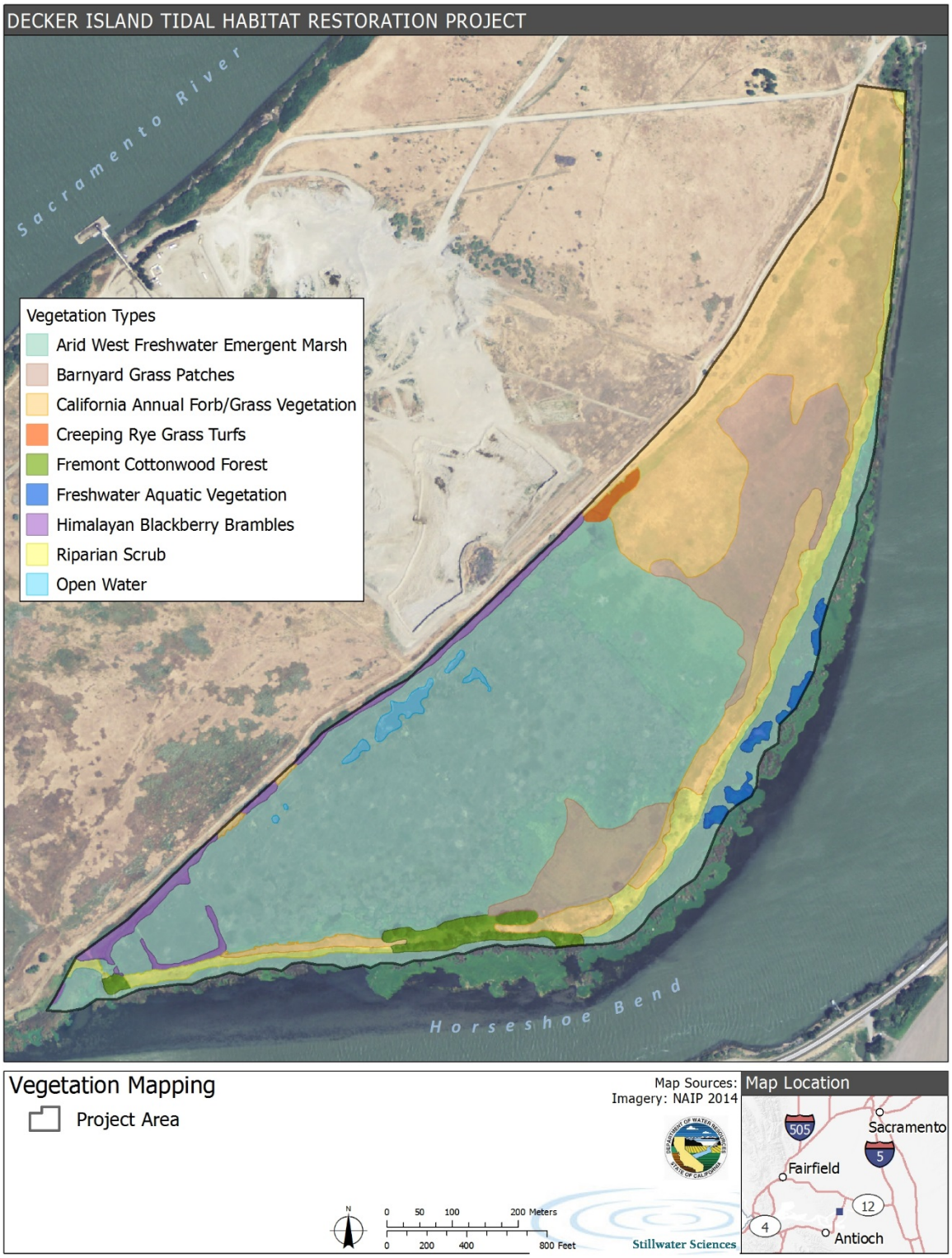

Figure 9. Vegetation types within the Project area

3.4.1.2 Special Status Plants

Special status and invasive plant surveys were conducted by the California Department Fish and Wildlife in June, July, and August of 2015; surveys were focused on determining presence of special-status and invasive plant species. Blue elderberry (*Sambucus nigra subsp. cerulea*) was the only special-status species identified on the interior of Decker Island. Mason's lilaeopsis (*Lilaeopsis masonii*), Delta tule pea (*Lathyrus jepsonii subsp. jepsonii*), Suisun marsh aster (*Symphyotrichum lentum*), and California Hibiscus (*Hibiscus lasiocarpos*) were found on the exterior levees in Horseshoe Bend, mainly in the northeast section of the Project area (Figure 10). Thick aquatic vegetation and riparian scrub prevented vegetation surveys in large sections of the Horseshoe Bend levee; however, these areas are not expected to be impacted by Project activities.

The likelihood of special-status species presence was determined by the documented observations of a species onsite, the presence and quality of potential habitat, and the proximity of known occurrences offsite. This resulted in the following categories of likelihood for a special-status species to occur in the Project site under current conditions:

- None: the species' required habitat (i.e., plant community types and/or elevation range) is lacking from the Project site.
- Low: the species' required habitat either does not occur on the Project site or is of very low quality such that no observations have occurred on or near the Project site.
- Moderate: the species' required habitat occurs on the Project site and there are known populations nearby, but there are no recorded observations on site.
- High: the species has been documented in the Project site.

A discussion of special status plants with potential to occur in the Project area can be found in Table 7.

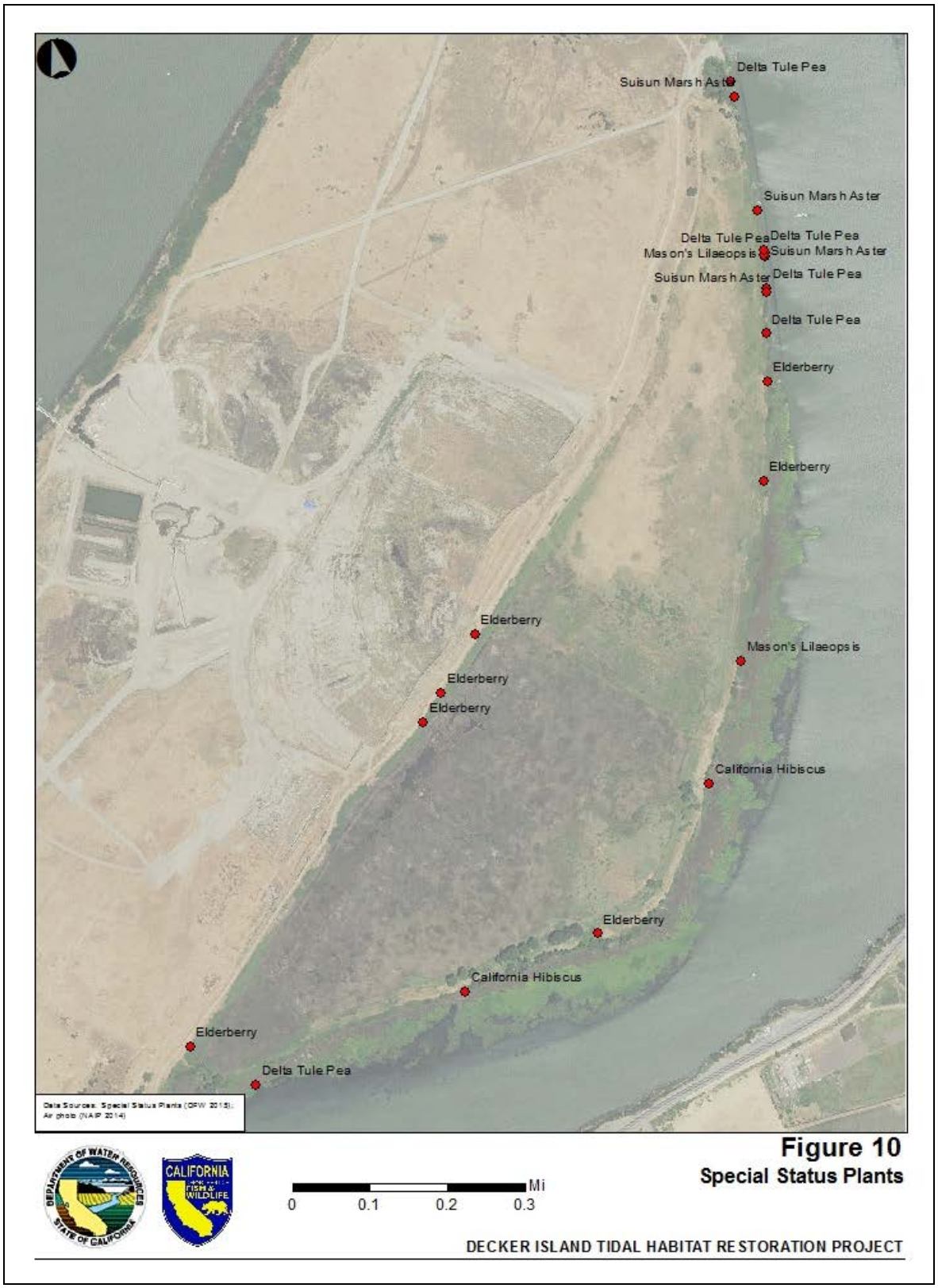

Figure 10. Special-Status and invasive plants identified during June, July, and August 2015 vegetation surveys.

Table 7. Special-status plants with potential to occur within the Project area

Common Name (*Scientific Name*)	Status Federal/State	Habitat Requirements	Likelihood to occur at the Project site under current conditions	Likelihood to occur at the Project site under post-restoration conditions
Antioch Dunes Evening-primrose (*Oenothera deltoides ssp. howellii*)	FE/CE/1B.1	Inland dunes; blooms March to September	**Low**; suitable habitat is not present on site; suitable habitat exists on adjacent properties	**Low;** the Project would not create suitable habitat
Bolander's Water-hemlock (*Cicuta maculata var. bolanderi*)	-/-/2B.1	Coastal, fresh, or brackish water marshes and swamps; blooms July to September	**Moderate;** freshwater marshes are present within the Project area	**Moderate;** suitable habitat would remain on site
California Hibiscus (*Hibiscus lasiocarpos var. occidentalis*)	-/-/1B.2	Freshwater marshes and riparian habitats; blooms June to September	**High**; two occurrences have been observed on site	**High**; suitable habitat would remain on site
Delta Mudwort (*Limosella australis*)	-/-/2B.1	Mud banks of freshwater and brackish marshes and swamps, and riparian scrub; blooms May to August.	**Moderate**; suitable habitat is present on site; occurrences within a half mile of the Project site	**Moderate**; suitable habitat would remain on site
Delta Tule Pea (*Lathyrus jepsonii var. jepsonii*)	-/-/1B.2	Freshwater and brackish marshes and riparian habitats; blooms May-July.	**High**; numerous occurrences were observed on Decker Island levees	**High**; suitable habitat would remain on site
Eel-grass Pondweed (*Potamogeton zosteriformis*)	-/-/2B.2	Freshwater marshes and wetland-riparian habitats; blooms June to July.	**Moderate**; suitable habitat present on site, closest occurrence is 3.5 miles away	**Moderate**; suitable habitat would remain on site

Mason's Lilaeopsis (*Lilaeopsis masonii*)	-/CR/1B.1	Freshwater and brackish marshes and swamps; usually restricted to area of tidal influence; blooms April to November.	**High**; numerous occurrences were observed on Decker Island levees	**High**; suitable habitat would remain on site
San Joaquin Spearscale (*Extriplex joaquinana*)	-/-/1B.2	Alkaline soils in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands; blooms April to October.	**None**; Closest occurrence is 4.5 miles north; suitable habitat not present on site	**None**; the Project would not create suitable habitat
Soft Bird's-beak (*Chloropyron molle ssp. molle*)	FE/CR/1B.2	Coastal salt marshes and swamps; blooms July to November	**None**; suitable habitat is not present on site, closest occurrence is 4.5 miles southwest	**None**; the Project would not create suitable habitat
Suisun Marsh aster (*Symphyotrichum lentum*)	-/-/1B.2	Freshwater marshes and wetland-riparian habitats; usually restricted to areas of tidal influence; blooms May to November	**High**; numerous occurrences have been observed on site	**High**; suitable habitat would remain on site

[1]FE= Federally Endangered,
CR=CA rare;
California Native Plant Society (CNPS) List 1B=rare, threatened, or endangered in California and elsewhere;
CNPS List 2=rare, threatened, or endangered in California, but more common elsewhere.

Decimals reflect threat ranks:
0.1=Seriously threatened in California,
0.2=Fairly threatened in California

3.4.1.3 Special Status Fish

The list of special status species (Table 8) considered during impact analysis for this project was compiled using a California Natural Diversity Database (CNDDB) search within a 5 mile radius of Decker Island (Appendix D), CDFW fish databases (CDFW 2016), USFWS Information for Planning and Conservation species generator website (Appendix D), and through informal communication with NMFS (Brycen Swart, personal communication, March 7, 2016). A brief summary of each special-status fish species, including status, life history, and habitat requirements, are provided in the sections below.

<u>Pacific Lamprey</u>

Adult Pacific Lampreys (*Entosphenus tridentatus*) are the largest lamprey in California, though dwarf morphs can be found in landlocked populations (Moyle et al. 2015). Like other lampreys in California, Pacific Lampreys are anadromous and spawn in gravelly streams, including tributaries of the San Francisco Estuary and the Central Valley. Adults spend their predatory phase of life in the ocean parasitizing a variety of fish species. Upstream migration to spawning habitat begins as early as January; however most upstream migrants arrive between March and late June. Ammocoetes, the larval stage of lampreys, are washed downstream to silty backwaters where they feed on algae and microorganisms until they metamorphose into juvenile macropthalmia. Upon completion of metamorphosis, downstream migration occurs during high outflow events (Moyle 2002).

There are no surveys that regularly monitor Pacific Lampreys; the extent of their distribution around Decker Island is not well known. A review of San Francisco Bay Study's fish database indicates that 53 Pacific Lampreys were caught in their otter trawl net, at stations in the Sacramento River near Decker Island, between 1994 and 2013 (CDFW 2016). Most were juveniles and caught during the winter months. Because juveniles and larvae rear in silty backwater habitats, it is unlikely that the proposed Project site would provide adequate habitat for this species.

Like other lampreys in California, the ecology of Pacific Lamprey has not been extensively studied. Populations appear to have declined based on anecdotal observations, but Pacific Lampreys still occur in most of their native areas (Moyle 2002). Pacific Lampreys are considered a federal and state species of concern.

<u>River lamprey</u>

The River Lamprey (*Lampetra ayresi*) is an anadromous species found in coastal streams from north of Juneau, Alaska to the San Francisco Estuary and Central Valley. Adults migrate into freshwater in fall after spending only 3–4 months in the ocean. Spawning takes place in February through May in gravelly riffles of tributary streams. Ammocoetes remain in the substrate in silty backwaters and eddies of streams where they feed on algae and microorganisms. River Lampreys are presumed to remain as ammocoetes in freshwater for 3–5 years before emigrating to the ocean in late spring (Moyle 2002).

Individuals are recovered annually from the state and federal fish collection facilities in the South Delta. In California, most records are from streams in the lower portion of the Sacramento-San Joaquin River system, but their distribution is poorly understood because they have not been studied extensively (Moyle 2002). A review of San Francisco Bay Study's fish database indicates 64 River Lampreys were caught in their otter trawl net, at stations in the Sacramento River near Decker Island, between 1992 and 2014 (CDFW 2016). Most were juveniles and caught during the winter months and a few in the spring.

Population trends for River Lampreys in California are not known, but are presumed to have declined as the amount of spawning and rearing habitat in the lower reaches of rivers has been reduced (Moyle 2002). River Lampreys are a Moderate Concern among the California Species of Special Concern (Moyle et al. 2015).

Green Sturgeon

The North American Green Sturgeon (*Acipenser medirostris*) is an anadromous species that primarily inhabits estuarine and coastal waters, but migrates into freshwater to spawn. There are two populations recognized under the ESA: (1) the Northern DPS, consisting of populations in coastal watersheds northward of and including the Eel River; and (2) the Southern DPS consisting of populations south of the Eel River (Klimley et al. 2007). Currently the only known spawning population in the Southern DPS occurs in the Sacramento River and Feather River (Seesholtz et al 2015). Spawning migrations take place from February through July, with a peak spawning period of mid-April to mid-June (Moyle 2002).

Recent spawning habitat surveys on the Sacramento River, upstream and downstream of the Red Bluff Diversion Dam, suggest Green Sturgeon spawn in pools, over substrate consisting of small to medium sized gravel with lesser amounts of cobble and sand (Poytress et al. 2009, Poytress et al 2010). Larvae presumably hatch in 7–9 days and juveniles spend from 1 to 4 years in fresh and estuarine waters before dispersing into the ocean (Beamesderfer and Webb 2002). Juveniles begin moving downstream toward the ocean primarily in summer, with outmigrant abundance in the lower Sacramento River and Delta likely peaking from June through November (Adams et al. 2002). Both adult and juvenile Green Sturgeons are benthic feeders, consuming shrimp, amphipods, clams, other invertebrates, and small fish (Moyle 2002).

Little is known about the life history of Green Sturgeon (Klimley et al. 2007), and few studies catch them regularly. San Francisco Bay Study's otter trawl sampling conducted in the Sacramento River from Sherman Island to upstream of the Rio Vista Bridge suggests juvenile Green Sturgeon could be present year-round in low numbers, with catch slightly skewed to the winter and early spring months; average total length of these sturgeon was 356 mm ± 127 mm, N=17 (CDFW 2016).

The southern DPS was listed in 2006 as threatened pursuant to the federal Endangered Species Act (71 FR 17757). Critical habitat for Green Sturgeon, Southern DPS, was designated in 2009 and includes all waters of the legal Delta (74 FR 52300). Green Sturgeons are also

considered a California Species of Special Concern with a High Concern status (Moyle et al 2015).

Table 8. Special-status fish species with potential to be found in Decker Island

Common Name (*Scientific Name*)	Status Federal/ State	Habitat Requirements	Likelihood to occur at the Project site under current conditions	Likelihood to occur at the Project site under post-restoration conditions
Pacific Lamprey (*Entosphenus tridentatus)*	FSC/SSC-	Anadromous parasitic species found in coastal streams and upper reaches of San Francisco Estuary and tributaries; spawn in gravelly streams in spring and rears in silty backwater. Adults enter the estuary as early as January but peaks in spring.	**Low**; backwater suitable for rearing likely onsite, though access is limited.	**Moderate**; access to suitable habitat would increase
River Lamprey (*Lampetra ayresi)*	-/SSC	Anadromous parasitic species found in coastal streams and upper reaches of San Francisco Estuary and tributaries; spawn in streams in spring and rears in silty backwater; adults may migrate briefly to ocean before returning in fall.	**Low**; backwater suitable for rearing likely onsite, though access is limited.	**Moderate;** access to suitable habitat would increase
North American Green Sturgeon, southern distinct population segment (*Acipenser medirostris)*	FT/SSC	Large, main stem rivers with cool water and cobble, clean sand, or bedrock for spawning. Juveniles are found year-round throughout the Delta, preferring benthic habitat.	**Low**; adult and juvenile sturgeon may occur near the Project site, but access is limited with more desirable habitat in Horseshoe Bend.	**Low**; access would be increased, but preferred habitat is located in Horseshoe Bend and the Sacramento River
White Sturgeon (*Acipenser transmontanus)*	-/SSC	In estuaries adults tend to concentrate in deep areas with soft bottoms, although they may move into intertidal areas to feed at high tides.	**Low;** adult and juvenile sturgeon may occur near the Project site, but access is limited with more desirable habitat in Horseshoe Bend.	**Low;** access would be increased, but preferred habitat is located in Horseshoe Bend and the Sacramento River

Sacramento Hitch (*Lavinia exilicauda*)	-/SSC	Warm, lowland, waters including turbid sloughs. Spawning occurs over gravel riffles but can occur on vegetation. Tolerate high temperatures and low salinities.	**Low;** within known range; desirable habitat is onsite, though access is limited.	**High**; access to suitable habitat would increase
Sacramento Splittail (*Pogonichthys macrolepidotus)*	-/SSC	Slow-moving sections of rivers and sloughs in Delta and Suisun Marsh; tolerate a range of salinities, low dissolved oxygen levels, and temperatures; preferred spawning habitat over vegetation in floodplains in late winter through spring.	**Moderate**; within known range of species; desirable habitat is onsite, though access is limited.	**High**; access to suitable habitat would increase
Delta Smelt (*Hypomesus transpacificus)*	FT/SE	Tidal areas from fresh water up to 18 ppt, but primarily near and upstream of the brackish zone where bottom salinity is approximately 2 ppt. Spawning occurs in tidal areas, most commonly upstream of salinity at 2 ppt. High turbidity levels (e.g. >10 ntu) and moderate temperatures (<25°C) are required for all life stages.	**Moderate**; within known range and critical habitat of Delta smelt. The X2 location, which is correlated to Delta Smelt occurrence is often centralized near Decker Island. Access is limited.	**Moderate;** access to site would increase, but preferred habitat is located in Horseshoe Bend and the Sacramento River
Longfin Smelt (*Spirinchus thaleichthys)*	-/ST	Euryhaline (capable of tolerating a wide range of salinities), pelagic and anadromous species found in scattered bays and estuaries from CA to Alaska.	**Low**; within known range of longfin smelt; however, they mostly migrate through the area on their way to Suisun and San Pablo Bay.	**Moderate**; access would increase, but species only present near Decker Island during spawning and larval life stages
Chinook Salmon (spring-run) (*Oncorhynchus tshawytscha)*	FT/SE	Low- to mid-elevation rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean.	**Moderate**; within known range of species; desirable habitat is onsite, though access is limited.	**High**; access to suitable rearing habitat would increase
Chinook Salmon (fall-run	SC/SSC	Main stem river reaches with cool water and available spawning; typically rear in	**Moderate**; within known range of	**High**; access to suitable rearing habitat

and late-fall-run) (*Oncorhynchus tshawytscha)*		freshwater for less than one year before migrating to the ocean.	species; desirable habitat is onsite, though access is limited.	would increase
Chinook Salmon (winter-run) (*Oncorhynchus tshawytscha)*	FE/SE	Sacramento River and tributaries below Shasta dam with cold water, and clean gravel appropriate for spawning. Peak juvenile migration through the Delta occurs from January through March	**Moderate**; within known range of species; desirable habitat is onsite, though access is limited.	**High**; access to suitable rearing habitat would increase
Central Valley Steelhead (*Oncorhynchus mykiss)*	FT/-	Enter freshwater beginning in August with peaks in September and October; hold in cool pools until flows allow for upstream migration; spawns in gravelly streams.	**Moderate**; within known range of species; desirable habitat is onsite, though access is limited.	**High**; access to suitable rearing habitat would increase

[1]FE = Federally Endangered,
FT = Federally Threatened,
FSC = Federal Species of Concern
SE = State Endangered,
ST = State Threatened,
SSC = State Species of Special Concern

White Sturgeon

White Sturgeon occur off the Pacific Coast from Mexico to the Gulf of Alaska. White Sturgeon are a large anadromous species that primarily inhabits estuarine and coastal waters where they can migrate long distances. In California, White Sturgeon are most abundant in the San Francisco Estuary and mainly spawn in the Sacramento and Feather Rivers. Spawning takes place between late February and early June, presumably in deep riffles and holes with gravel (Moyle 2002). Females spawn every 2 to 4 years and are highly fecund; a typical female could have more than 200,000 eggs (Chapman et al. 1996). Juvenile tend to reside in the upper estuary and their abundance is related to freshwater flow: high outflow years tend to produce more young-of-the-year sturgeon (Kohlhorst et al. 1991). Since the 1980s, annual recruitment of White Sturgeon has decreased although several strong year classes persist (Moyle et al. 2015). Sturgeon are benthic feeders; young will feed on crustaceans and adults have a more varied diet that includes crabs, shrimp, and clams (Moyle 2002).

Long-term fish monitoring programs indicate juvenile and adult White Sturgeon occur in the Sacramento River, near Decker Island (CDFW 2016). In 2006, which was classified as a “wet” year for the Sacramento Valley (California Data Exchange Center (CDEC) 2016), approximately 20 juvenile sturgeon (presumably White Sturgeon) were caught by the 20 mm survey from March to early May. They ranged in length from 8 to 20 mm with an average length of almost 13 mm. In various years from 1995-2014, San Francisco Bay Study caught 134 White Sturgeon. They were caught in every month of the year and ranged from young-of-the-year to an adult that was 1300 mm long.

White Sturgeon is a California Species of Special Concern with a designated High Concern status. Although White Sturgeon are successfully cultured, annual recruitment in California appears to have decreased since the early 1980s (Moyle et al. 2015).

Sacramento Hitch

Hitch are deep-bodied minnows that are native to the Sacramento and San Joaquin valleys. They can tolerate high temperatures and inhabit warm lowland waters ranging from clear streams to turbid sloughs. Hitch spawn in the spring. Although they can spawn on vegetation, they typically spawn in stream riffles. Young-of-the-year Hitch will stay in the shallows until moving out into open water at around 50 mm fork length. Hitch are omnivorous and feed on zooplankton and insects in the open-water (Moyle 2002). Within the Delta, fish sampling programs and studies have caught relatively few Hitch over the years (Moyle et al. 2016).

The occurrence of Hitch in the waters surrounding Decker Island is not well known. Very few Hitch have been caught by long-term fish monitoring programs sampling the benthic and open water habitats of the Sacramento River near Decker Island (CDFW 2016). Although Hitch probably are not occupying the open-water channel habitat of the Sacramento River, they do occur in the backwater slough habitats of at the Decker Island Habitat Enhancement Project (DIHEP) on the northern tip of Decker Island. During five years of monitoring of this restoration site, 162 Hitch were caught with seines inside the restoration site, ranging in fork length from 14 to 399 mm. In contrast, only one Hitch was caught with a beach seine on the shoreline of

Decker Island. In 2005, ripe male and female Hitch were seined and shocked in the backend of the restoration channels. While being handled and measured, some Hitch began extruding milt and eggs. A few juvenile Hitch were caught in subsequent months suggesting Hitch had successfully spawned in the heavily vegetated, backwater slough habitat (Rockriver 2008).

Hitch is a California Species of Special Concern with a designated Moderate Concern status. Although Hitch are broadly distributed, they appear to be in a long-term decline (Moyle et al. 2015).

Sacramento Splittail

Sacramento Splittail are endemic to the Central Valley and San Francisco Estuary. In the San Joaquin River they were once distributed as far south as Friant. In the Sacramento River, they have recently been observed as far upstream as Red Bluff Diversion Dam; however, the upstream extent of their spawning migrations is unknown (Feyrer et al. 2005). Mature Splittail migrate through the northern Delta and lower Sacramento River to spawning areas from January through April and spawn any time from late February to early July (Moyle 2002). Spawning occurs on inundated channel margin and floodplain vegetation during springtime high water events. Larvae remain in flooded vegetation for 3-6 weeks before migrating downstream to rear in estuarine marshes for 1-2 years (Moyle et al. 2015). Splittail abundance is highly correlated with recruitment success related to Yolo Bypass inundation (Sommer et al. 2001).

When they are not spawning, Splittail are often most abundant in sloughs of Suisun Marsh and the northern portion of the Delta. Their tolerance of high salinities, a wide range of temperatures, and low dissolved oxygen levels (<1 mg/L) makes them particularly well suited to slow-moving sections of rivers and sloughs. Sacramento Splittail feed on benthic detritus and epibenthic invertebrates (Moyle 2002).

Long-term fish monitoring programs indicate Splittail are most abundant around Decker Island during the spring months, although they can be present almost year-round (CDFW 2016). For example, in sampling stations near Decker Island, the 20mm survey caught larval/juvenile Splittail April through June, and San Francisco Bay Study's trawl sampling caught a least one Splittail every month, except in December, in low numbers. Similarly, beach seining conducted by the USFWS's Juvenile Fish Monitoring Program in sampling stations just upstream of Decker Island caught juvenile Splittail primarily in May and June (USFWS 2016). During 5 years of monitoring of the DIHEP at the northern tip of the island, almost 1,000 juvenile Splittail were caught of which approximately 90 % were caught on the beach outside of the restoration site during late spring (Rockriver 2008).

Splittail were listed by USFWS as a threatened species in 1999 because of concerns about apparent long-term abundance declines, but re-analysis of abundance data led Splittail to be de-listed in 2003. However, CDFW still considers Splittail to be a Species of Special Concern with Moderate Concern status (Moyle et al. 2015).

Delta Smelt

Delta Smelt are endemic to the upper San Francisco estuary. Their historic range is thought to have extended from Suisun Bay upstream to at least the city of Sacramento on the Sacramento River and Mossdale on the San Joaquin River, which is similar to their current distribution on the Napa River, Cache Slough, Suisun Marsh tributaries, San Joaquin River, and Sacramento River (Merz et al. 2011). A non-migratory contingent has been recently observed to remain in freshwater and carry out their entire lifecycle in the tidal freshwater region of the Cache Slough Complex, which offers cool, turbid habitat and abundant prey (Sommer et al. 2011).

Delta Smelt were once one of the most common pelagic fish in the upper Sacramento-San Joaquin Estuary (Moyle 2002). In recent decades, Delta Smelt and other pelagic fish species have experienced a substantial decline in population (Sommer et al. 2007, Baxter et al. 2010). Delta Smelt abundance indices calculated from the Summer Townet and Fall Midwater Trawl surveys suggest Delta Smelt abundance is still relatively low compared to previous decades (www.dfg.ca.gov/delta/data). The 2014 and 2015 Fall Midwater Trawl indices of 9 and 7, respectively, are the lowest on record.

Delta Smelt are a pelagic species, inhabiting open waters, away from the bottom and shore-associated structural features (Nobriga and Herbold 2009). Distribution is concentrated around the low salinity zone (≤ 5–6 ppt), where incoming salt water and out flowing freshwater mix, creating a turbid zone of high primary and secondary productivity (Jassby et al. 1995). Delta Smelt feed primarily on zooplankton, mysid shrimp, and amphipods. Low water clarity has shown to be beneficial to key fish species in the Delta, including Delta Smelt (Nobriga et al. 2008, Slater 2012). As an annual species, the majority of Delta Smelt complete their life cycle in a single year. Only a small percentage live up to two years and these fish are believed to spawn in both years (Bennett 2005). Spawning migration upstream to tidal freshwater is triggered by the first flow pulses of the year, typically from December-March (Grimaldo et al. 2009; Sommer et al. 2011). After hatching, young smelt may return downstream to brackish regions to rear (Dege and Brown 2004).

At sampling stations near Decker Island, long-term fish monitoring programs indicate Delta Smelt are present year-round in the channel habitats (Table 9; CDFW 2016). Similarly, Delta Smelt were also caught on the shoreline in two locations just upstream of action area. The USFWS Delta Juvenile Fish Monitoring Program caught Delta Smelt throughout the year at their Sandy Beach sample site (2007-2015) and most of the year at their Stump Beach site (1967-2007) on the Sacramento River (USFWS 2016). During 5 years of monitoring at the DIHEP at the northern tip of the island, only two Delta Smelt were caught with beach seines at a reference beach less than 1,000 feet north of the proposed Project (Rockriver 2008).

The USFWS listed Delta Smelt as threatened on March 5, 1993 (58 FR 12854), and designated critical habitat for this species on December 19, 1994 (59 FR 65256). On April 7, 2010, USFWS announced their 12-month finding on a petition to reclassify the Delta Smelt from a threatened to an endangered species. They determined that reclassification is warranted, but precluded by other higher priority listing actions (75 FR 17667). The Delta Smelt was also listed in 1993 as a

threatened species pursuant to the California Endangered Species Act and uplisted to endangered on January 20, 2010.

Table 9. Delta Smelt raw catch totals, by month, from IEP long-term monitoring program sampling stations near Decker Island from 1995-2015 (CDFW 2016)

	SMWT[1]	SKT[2]	20mm[3]	STN[4]	FMWT[5]	BSMWT[6]	BSOT[7]
January (Adult)	17	220				19	1
February (Adult)	2	106				17	4
March (Adult/larval)	17	152	45			9	2
April (Adult/Larval)	1	41	84			11	0
May (Adult/Larval/Juvenile)		13	551			11	0
June (Adult/Larval/Juvenile)		4	1,153	789		16	10
July (Adult/Juvenile)			290	969		40	3
August (Adult/Juvenile)				262	1	25	1
September (Adult)					40	75	2
October (Adult)					450	49	11
November (Adult)					71	63	7
December (Adult)					178	39	1

1. Spring Midwater Trawl (SMWT) sampling stations 705, 706, and 707 from 1995-2001.
2. Spring Kodiak Trawl (SKT) sampling stations 706 and 707 from 2002-2015.
3. 20mm Survey sampling stations (20mm) 705, 706, and 707 from 1995-2015.
4. Summer Townet sampling (STN) stations 703 and 710 from 1995-2015.
5. Fall Midwater Trawl (FMWT) sampling stations 705, 706, and 707 from 1995-2015.
6. Bay Study Midwater Trawl (BSMWT) sampling stations 750, 751, and 752 from 1995-2014.
7. Bay Study Otter Trawl (BSOT) sampling stations 750, 751, and 752 from 1995-2014.

Longfin Smelt

Longfin Smelt is an estuarine species occurring in the San Francisco Estuary, including the Delta, as well as other estuaries along coastal Northern California. In the San Francisco Estuary, Longfin Smelt populations are concentrated in Suisun, San Pablo, and North San Francisco bays, and rarely occur upstream of Rio Vista or Medford Island in the Delta (Moyle 2002). The distribution of Longfin Smelt depends on salinity and water temperature, as well as on the life stage of individual fish. While Longfin Smelt can tolerate salinities ranging from nearly pure seawater to fresh water, individuals seem to prefer salinities in the range of 15–30 ppt after completing their early life stage (Moyle 2002). They often concentrate in San Pablo Bay in April-June and become more dispersed by late summer. Individuals mature by the end of their second year of life and migrate upstream near Rio Vista to spawn in fresh water during fall or winter. In the Delta, Longfin Smelt spawn over sand or gravel substrates, rocks, and aquatic plants at water temperatures of 44–58.1 ˚F (7–14.5 ˚C) (Moyle 2002).

At sampling stations near Decker Island, IEP long-term monitoring programs indicate Longfin Smelt are present year-round in the channel habitats (CDFW 2016). San Francisco Bay Study's trawl sampling has caught Longfin Smelt year-round near the island, of which approximately 70 % (390 fish) were caught in November and December. Approximately 10,000 larval and juvenile Longfin Smelt were caught in sampling stations around Decker Island, primarily in May and June, by the 20mm Survey from 1995-2015.

In 2012, the USFWS determined that federal listing of the San Francisco Bay-Delta DPS was warranted, but precluded by other higher priority listing actions (77 FR 19755). The Longfin Smelt is considered threatened by CDFW because of its declining abundance in the Delta. Low abundance-indices for Longfin Smelt prompted concern that a "step change" had occurred in the population of Longfin Smelt and other pelagic-oriented species in the Delta (Armor et al. 2005).

Chinook Salmon

The distribution of Chinook Salmon in the Pacific Ocean depends upon ocean temperatures and off the coast of North America, they are generally found from Kotzebue Sound, Alaska, to south of Monterey Bay, California. Chinook Salmon are categorized into "runs" based upon genetic traits and life history attributes such as timing of migration, spawning location, and incubation time (Moyle 2002). Spawning runs of anadromous Chinook Salmon in California occur in rivers of the north and central coast and those draining the Central Valley. There are four distinct runs of Chinook Salmon in the Central Valley, all of which spend part of their life cycle in the Delta: Sacramento River winter-run Chinook Salmon, Central Valley spring-run Chinook Salmon, Central Valley fall-run Chinook Salmon, and Central Valley late fall-run Chinook Salmon. Adults of all four runs pass through the Delta on their upstream spawning migrations and juveniles spend varying amounts of time rearing in the Delta.

Juvenile Chinook Salmon feed on zooplankton, larger crustaceans and aquatic insects. Ephemeral habitats are very important to rearing Chinook Salmon due to high densities of prey resources, primarily chironomid larvae (Sommer et al. 2001). High abundance of invertebrate

prey resources for juvenile Chinook Salmon can be associated with marsh edge habitat. Chinook Salmon fry tend to remain close to marsh banks and vegetation, near protective cover, in dead-end tidal channels during the day but likely disperse throughout the channel at night (Kjelson et al. 1982). In the north Delta, the highest Chinook Salmon fry density levels were associated with low substrate hardness (sand-mud substrates) with low shoreline slopes, and with high Secchi depths and richness of other fish species (McLain and Castillo 2010).

IEP long-term fish monitoring programs indicate Chinook Salmon can be caught year-round in the Sacramento River, near Decker Island; however, juveniles are rarely caught in late summer/early fall when water temperatures are at their warmest (CDFW 2016). The largest catch of juvenile Chinook Salmon in the San Francisco Bay Study midwater trawl and in the Spring Kodiak Trawl occur during the months of May and June. For the Juvenile Fish Monitoring Program run by the USFWS, the highest catch of juvenile salmon along the shoreline occurred during February and March and none were caught August through November (Table 10; USFWS 2016). On Decker Island, at least one juvenile salmon from all four races were caught during the 5-year monitoring program at the DIHEP (Table 11; Rockriver 2008). The majority of the fish were caught in March with rapidly declining catches through July.

Central Valley spring-run Chinook Salmon

Spring-run Chinook Salmon enter the San Francisco Bay as sexually immature fish in spring or early summer and migrate to tributaries of the Sacramento River, where they hold in deep, cold pools for several months prior to spawning in early fall. Spring-run migrants enter the estuary as early as March with peak migration occuring from May through June. Juveniles typically rear in streams for 3-15 months before moving downstream, primarily as smolts that move rapidly through the Delta (Moyle 2002). However, some spring-run Chinook in Butte Creek emigrate as fry and, therefore, the abundance of spring-run Chinook rearing in the Delta may be greater in some years (Moyle 2002).

Historically, spring-run Chinook Salmon migrated far upstream in larger tributaries of the Sacramento and San Joaquin rivers. Due to dam construction, spring-run Chinook were eliminated from the San Joaquin River drainage and their spawning populations were greatly reduced in the Sacramento River drainage. Currently, Central Valley spring-run Chinook Salmon are supported primarily by spawning populations in Deer, Mill, and Butte creeks with much smaller runs in streams such as Big Chico, Antelope Creek, and Beegum creeks (CDFG 2005b). Following restoration, spring-run Chinook are returning to historical spawning ground in Lower Clear Creek (CDFG 2005b). Spring-run salmon also spawn in the mainstem Sacramento, Yuba, and Feather rivers, but are likely hybridized with fall-run Chinook Salmon.

Spring-run Chinook Salmon in the Central Valley were listed as state and federally threatened in 1999 by the State Fish and Game Commission and NMFS (64 FR 50394). Critical habitat for Central Valley spring-run Chinook includes the Delta to the western edge of Sherman Island (70 FR 52488).

Central Valley fall-run Chinook Salmon

Mature Central Valley fall-run Chinook Salmon migrate from the ocean in late summer and early fall and spawn within weeks of reaching the lowland portions of larger rivers and their tributaries (Moyle 2002). Fall migrants enter the estuary as early as June; however, peak migration occurs from September through October. Juveniles emerge from the gravel in December through March and move downstream to mainstem rivers or estuaries to rear for 1-7 months (Moyle et al. 2015). Central Valley fall-run Chinook Salmon have the longest estuarine rearing period of the four Chinook Salmon runs in the Central Valley (Moyle 2002).

The fall run is currently the most abundant Chinook Salmon run in the Central Valley (Azat 2014). Fall-run Chinook in the Sacramento and San Joaquin rivers are supplemented by hatcheries on Battle Creek and the Feather, American, Mokelumne, and Merced rivers. The combined fall-run and late fall-run Chinook Salmon populations are part of a single evolutionary Significant Unit, which is a federal species of concern and a California Species of Special Concern with High Concern status (Moyle et al. 2015).

Central Valley late fall-run Chinook Salmon

Late fall-run Chinook salmon migrate upstream from October through April and peak spawning occurs primarily in late December and January. Fry begin to emerge from the gravel in June and may spend 7–13 months in freshwater prior to outmigration (Moyle et al. 2015). There have been no reliable run-size estimates since 1994 because the gates of Red Bluff Diversion Dam are left open during the migration period to allow fish passage (Cramer and Demko 1996). Late fall-run Chinook are a California Species of Special Concern with High Concern Status (Moyle et al. 2015) and, as part of a single Evolutionary Significant Unit with fall-run Chinook, are a federal species of concern.

Sacramento River winter-run Chinook Salmon

Winter-run Chinook Salmon are unique to the Sacramento River. They typically migrate upstream as sexually immature fish in winter and spring and then spawn in early summer. Winter-run migrants enter the estuary as early as December; however the peak migration occurs from January through March. Presently, their spawning habitat is restricted to the Sacramento River below Shasta Reservoir, where hypolimnetic, cool dense waters below the thermocline, releases are used to maintain river temperatures of 10-15˚C. Juveniles spend 5-10 months in streams followed by an intermediate period in the San Francisco estuary, including the Delta (Moyle 2002).

In 1989, declines in the abundance of returning adults led the State Fish and Game Commission to list winter-run Chinook Salmon as endangered (CDFG 2005a), while the NMFS listed winter-run Chinook as a threatened species (54 FR 32085). In 1994 the federal listing status of winter-run Chinook Salmon was reclassified to endangered (59 FR 440). In 1993 critical habitat was designated for winter-run Chinook Salmon to include the Sacramento River from Keswick Dam to Chipps Island at the western extent of the Delta (58 FR 33212).

Table 10. Chinook Salmon raw catch totals, by month and race, from the USFWS beach seine sampling stations on the Sacramento River near Decker Island (USFWS 2016). Stump Beach (station SR012E) was sampled from 03/19/1967 - 02/06/2007, and Sandy Beach (station SR012W) was sampled from 04/19/2007 – 05/29/2015.

Stump Beach						
	Fall	Late-fall	Spring	Winter	Not Raced	**Total**
January	717	1	24	3	-	**745**
February	1568	1	41	6	15	**1631**
March	1558	-	20	4	59	**1641**
April	495	2	12	-	-	**509**
May	318	1	2	-	-	**321**
June	121	11	-	-	-	**132**
July	1	-	-	-	-	**1**
August	-	-	-	-	-	**-**
September	-	-	-	-	-	**-**
October	-	-	-	-	-	**-**
November	-	-	-	-	-	**-**
December	63	1	9	4	-	**77**

Sandy Beach						
	Fall	Late-fall	Spring	Winter	Ad Clip	**Total**
January	96	-	11	2	1	**110**
February	281	-	18	2	1	**302**
March	92	-	15	-	-	**107**
April	27	-	22	-	9	**58**
May	23	2	-	-	-	**25**
June	12	-	-	-	-	**12**
July	-	-	-	-	-	**-**
August	-	-	-	-	-	**-**
September	-	-	-	-	-	**-**
October	-	-	-	-	-	**-**
November	-	-	-	-	-	**-**
December	39	2	3	2	-	**46**

Central Valley Steelhead

Central Valley Steelhead are the anadromous form of Rainbow Trout, which have extremely variable and flexible life history patterns. Steelhead are not considered taxonomically distinct from populations of non-anadromous Rainbow Trout with which they co-occur, but rather they share a common gene pool (Garza and Pearse 2008) and are capable of interbreeding. In the Central Valley, Steelhead enter freshwater beginning in August with migration peaking in late September through October and then hold until flows are adequate to allow them to enter tributaries for spawning (Moyle 2002).

Juvenile Central Valley Steelhead spend the first 1-2 years of their life in cool, clear, fast-flowing streams and rivers before migrating downstream towards the Delta. Some juvenile Steelhead may rear for short periods of time in freshwater marshes, tidal marshes and other areas in the Delta before heading to the ocean (NMFS 2014).

In the Delta, it appears adult Steelhead are more abundant in the fall and juvenile Steelhead more abundant in the spring (NMFS 2014). In open water habitats near Decker Island, Spring Kodiak Trawl caught most of their Steelhead in February and March (CDFW 2016). During winter on the Sacramento River shoreline, approximately 3 miles upstream of Decker Island, the Delta Juvenile Fish Monitoring Program caught Steelhead, primarily from January through March, in their seine hauls at their historic beach seine site at Stump Beach and their current beach seine site across the river at Sandy Beach (USFWS 2016).

The Central Valley Steelhead Distinct Population Segment was listed by NMFS as threatened in 1998 and the listing status was reaffirmed in 2006 because the resident and anadromous forms remain markedly separated due to physical, ecological, and behavioral factors (71 FR 834). CDFW considers the Central Valley Steelhead a species of High Concern (Moyle et al. 2015).

Table 11. Total catch of juvenile Chinook Salmon, Splittail, Delta Smelt and Steelhead at the DIHEP from 2003 through 2007 (Rockriver 2008). Salmon catch is separated by race, adipose fin clip (Clip), and no lengths (NL).

	Chinook Salmon								
Gear	**Fall**	**Late Fall**	**Spring**	**Winter**	**Clip**	**NL**	**Splittail**	**Delta Smelt**	**Steelhead**
Seine									
2003	143	4	8	0	1	28	51	0	0
2004	185	0	0	0	0	0	267	2	0
2005	131	0	30	0	5	2	115	0	1
2006	112	1	3	0	2	0	560	0	1
2007	27	0	1	0	0	0	0	0	0
Subtotal	598	5	42	0	8	30	993	0	2
Electrofishing									
2003	5	0	1	0	2	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	11	0	0	0	0	0	3	0	0
2006	4	0	1	0	0	0	8	0	0
2007	3	0	1	1	0	0	0	0	0
Subtotal	23	0	3	1	2	0	11	0	0

3.4.1.4 Special Status Wildlife

Based on queries of the CNDDB, the Information for Planning and Conservation website, eBird website, as well as field surveys and consultation with USFWS, an exhaustive list of State and federal special status species were identified as potentially occurring on or in the vicinity of Decker Island. However, the likelihood of many of these species occurring on site are low as Decker Island is either void of required habitat or there are no known population near the Project area.

Several special-status species were identified on or near Decker Island from surveys and site visits including Loggerhead shrike (*Lanius ludovicianus*), Northern harrier (*Circus cyaneus*), Song sparrow ("Modesto" population), Swainson's hawk (*Buteo swainsoni)*, White-tailed kite (*Elanus leucunts),* and Yellow warbler (*Setophaga petechia*). There is also a mixed great egret (*Ardea alba*) and great blue heron rookery (*Ardea herodias*) along the southern portion of the island.

Special-status wildlife species with potential to occur on the Project site are listed in Table 12 along with their potential to occur on site under current conditions and after restoration. The likelihood of special-status species presence was determined by the documented observations of a species onsite, the presence and quality of potential rearing or nesting habitat, and the proximity of known occurrences offsite. This resulted in the following categories of likelihood for a special-status species to occur in the Project site under current conditions:

- None: the species' required habitat (i.e., plant community types and/or elevation range) is lacking from the Project site;
- Low: the species' required habitat either does not occur on the Project site or is of very low quality such that no observations have occurred on or near the Project site;
- Moderate: the species' required habitat occurs on the Project site and there are known populations nearby, but there are no recorded observations on site;
- High: the species has been documented in the Project site.

A summary of life history, habitat associations, and location information is provided in Table 12.

Table 12. Special-status terrestrial species with potential to occur on Decker Island.

Common Name (*Scientific Name*)	Status Federal/ State	Habitat Requirements	Likelihood to occur at the Project site under current conditions	Likelihood to occur at the Project site under post-restoration conditions
Invertebrates				
Delta Green Ground Beetle (*Elaphrus viridis*)	FT/-	Found in grasslands associated with seasonal habitats like vernal pools	**None;** Habitat is not present on site and the species has not been recorded in the Project area.	**None;** Habitat will not be created onsite.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT/-	Found in central valley in association with the elderberry trees (*Sambucus mexicana*)	**Low**; Habitat is on site but the Project site is likely outside of the species range.	**Low**; Habitat onsite will not be disturbed.
Vernal Pool fairy shrimp (*Branchinecta lynch*i)	FT/-	Found in seasonal habitats like vernal pools throughout the Sacramento Valley, and to a lesser extent the San Joaquin Valley and Bay Area.	**None;** Habitat is not on site and the species has not been recorded in the Project area.	**None;** Habitat will not be created onsite.
Vernal Pool tadpole shrimp (*Lepidurus packardi*)	FE/-	Found in seasonal habitats like vernal pools throughout the Sacramento Valley, and to a lesser extent the San Joaquin Valley and Bay Area.	**None;** Habitat in not on site and the species has not been recorded in the Project area.	**None;** Habitat will not be created onsite.
Reptiles				
Giant garter snake (*Thamnophis gigas*)	FT/ST	Sloughs, canals, low gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and	**Moderate**; suitable habitat is on site and documented sightings have occurred nearby	**Moderate;** suitable habitat would remain on site.

		emergent vegetation for basking and areas of high ground protected from flooding during winter		
Western pond turtle (*Actinemys marmorata*)	-/SSC	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	**High;** suitable habitat is present on site and it is commonly sighted in the Delta	**High;** suitable habitat would remain on site
Amphibians				
California red-legged frog (*Rana draytonii*)	FT/-	Occurs in various aquatic habitats with a mix of riparian and upland dispersal habitats.	**Low;** Suitable habitat not on site but the species has not been observed near Decker Island.	**Low**; the Project would not create suitable habitat
California tiger salamander (*Ambystoma californiense*)	FE/ST	Found in seasonal habitats, like vernal pools, and associated upland dispersal habitat throughout California.	**Low;** Habitat is not on site and the species has not been recorded near the Project area.	**Low**; the Project would not create suitable habitat
Birds				
Bank Swallow (*Riparia riparia*) **nesting**	-/SSC	Open-canopy, deciduous riparian woodland close to water, along streams or wet meadows	**None**; no suitable vertical bank habitat at the Project site	**None**; no suitable vertical bank habitat would be created
Burrowing owl (*Athene cunicularia*) **Burrowing and wintering sites**	BCC/SSC	A yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Uses rodent or other burrow for roosting and nesting cover.	**Moderate**; Habitat is on site and the species has been observed near Decker Island.	**Moderate**; suitable habitat would remain on site
California black rail (*Laterallus jamaicensis coturniculus)*	BCC/ST, SFP	Occurs most commonly in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and	**Moderate**; Habitat is on site and the species has been observed near Decker Island.	**Moderate**; suitable habitat would increase, but the species is rare in the area.

		saltgrass.		
Costa's hummingbird (*Calypte costae*) **nesting**	BCC/-	Primary habitats are desert wash, edges of desert riparian and valley foothill riparian, coastal scrub, desert scrub, desert succulent shrub, lower-elevation chaparral, and palm oasis.	**Low**; Habitat in not on site and the species has not been recorded in the Project area.	**Low**; the Project would not create suitable habitat
Lewis's woodpecker (*Melanerpes lewis*) **nesting**	BCC/-	Winter resident occurring in open oak savannahs, broken deciduous, and coniferous habitats.	**Low**; suitable habitat is not on site but the species has been observed near Decker Island.	**Low**; the Project would not create suitable habitat
Loggerhead shrike (*Lanius ludovicianus*) **nesting**	BCC/SSC	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats.	**High**; Habitat is on site and the species has been observed in the project area.	**High**; suitable habitat would remain on site
Mountain plover (*Charadrius montanus*) **wintering**	BCC/SSC	Winter resident from September through March. Found on short grasslands and plowed fields of the Central Valley. Avoids high and dense cover. Uses open grasslands, plowed fields with little vegetation, and open sagebrush areas. Often roosts in depressions such as ungulate hoof prints and plow furrows	**None**; Habitat in not on site and the species has not been recorded in the project area.	**None**; the Project would not create suitable habitat

Northern harrier (*Circus cyaneus*) **nesting**	-/SSC	Frequents meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands. Uses tall grasses and forbs in wetland, or at wetland/field border, for cover; roosts on ground.	**High**; Habitat is on site and the species has been observed in the project area.	**High**; suitable habitat would remain on site
Oak titmouse (*Baeolophus inornatus*) **nesting**	BCC/-	Common resident in a variety of habitats, but is primarily associated with oaks. Occurs in montane hardwood-conifer, montane hardwood, blue, valley, and coastal oak woodlands, and montane and valley foothill riparian habitats.	**High**; Habitat is on site and the species has been observed in the project area.	**High**; suitable habitat would remain on site
Ridgeway's Rail (*Rallus longirostris obsoletus*)	FE/SE	Occurs most commonly in salty or brackish marshes dominated by pickleweed, cordgrass, and bulrushes.	**Low**; Habitat is not on site and species has been observed near Decker Island.	**Low**; Habitat will not be created for this species.
Short-eared owl (*Asio flammeus*) **nesting**	-/SSC	Irrigated alfalfa or grain fields, ungrazed grasslands, old pastures, and salt or freshwater marshlands	**Moderate**; Habitat is onsite but the species has not be observed in the area.	**Moderate**; suitable habitat would remain on site
Song sparrow ("Modesto" population) (*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. Also breeds in damp thickets and coastal scrub.	**Moderate**; Habitat is on site and the species has been observed near Decker Island.	**Moderate;** suitable habitat would increase on site
Swainson's hawk (*Buteo swainsoni*) **nesting**	BCC/ST	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable	**High**; Habitat is on site and the species has been observed in the project area.	**High;** suitable habitat would remain on site

		grain or alfalfa fields, or livestock pastures.		
Tricolored blackbird (*Agelaius tricolor*) **nesting colony**	BCC/SE	Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats.	**Moderate**; Habitat is on site and the species has been observed near Decker Island; breeding colonies are rare near the Project area.	**Moderate;** suitable habitat would remain on site
White-tailed kite (*Elanus leucunts*) **nesting**	-/SFP	Yearlong resident in coastal and valley lowlands; rarely found away from agricultural areas. Uses trees with dense canopies for cover.	**High**; Habitat is on site and the species has been observed in the project area.	**High;** suitable habitat would remain on site
Yellow warbler (*Setophaga petechia*) **nesting**	BCC/SSC	Usually found in riparian deciduous habitats in summer: cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland. Also breeds in montane shrubbery in open conifer forests	**High**; Habitat is on site and the species has been observed in the project area.	**High;** suitable habitat would remain on site
Yellow-billed magpie (*Pica nuttalli*) **nesting and communal roosts**	BCC/-	Inhabits valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, orchard vineyard, cropland, pasture, and urban habitats.	**Moderate**; Habitat is on site and the species has been observed near Decker Island.	**Moderate;** suitable habitat would remain on site.
Mammals				
Western red bat (*Lasiurus blossevillii*)	-/SSC	Roosting habitat includes forests and woodlands. Feeding occurs over a wide variety of habitats including	**Moderate**; Habitat is on site and the species has been observed near Decker Island.	**Moderate;** suitable habitat would remain on site

		grasslands, shrublands, open woodlands, wetlands, and croplands.		

Status codes:
Federal
FE = Listed as endangered under the federal Endangered Species Act
FT = Listed as threatened under the federal Endangered Species Act
BCC = Birds of Conservation Concern

State
SE = Listed as Endangered under the California Endangered Species Act
ST = Listed as Threatened under the California Endangered Species Act
SSC = California Species of Special Concern
SFP = CDFW Fully Protected species

Invertebrates

There are a few special status invertebrate species known to occur near the Project site; however, all but one of the species require vernal pool, alkali seasonal wetland, or sand dune habitats that are absent from the project site. Due to lack of suitable habitat on the Project site, these species have no potential to occur and are not further addressed in this document: Vernal pool fairy shrimp (*Branchinecta lynchi*), Vernal pool tadpole shrimp (*Lepidurus packardi*), and Delta green ground beetle (*Elaphrus viridis)*.

Valley elderberry longhorn beetle

The valley elderberry long horn beetle (VELB), a federally listed threatened species, is completely dependent on its host plant, elderberry (*Sambucus* spp.), a common shrub of riparian forests and adjacent upland habitats in the Central Valley. The host plant for this species occurs on site in several locations; however, the project site is believed to be outside the range of this species. The two closest occurrences of this species are located along Dudley Creek, just east of Pedrick Road from 1991, 0.1 mile north of Dixon Ave, just east of Dixon also from 1991, and a 1987 occurrence 2.25 miles east of Franklin Field along the Cosumnes River. Within the primary zone of the Delta, there is one known occurrence from 1984 along Wing Levee Road between Howard and Undine Roads on Union Island near Middle River.

Reptiles and Amphibians

Habitat for two special-status reptile species occurs on the Project site: giant garter snake (*Thamnophis gigas*), a federal and state threatened species; and western pond turtle (*Actinemys marmorata*), a California Species of Special Concern. Habitats for these species are known to occur in Solano or Sacramento counties, but do not exist on the Project site and therefore are not considered further in this document. These species include: California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*).

Giant garter snake

The giant garter snake resides in marshes, ponds, sloughs, small lakes, low-gradient streams, and other waterways, and in agricultural wetlands, including irrigation and drainage canals, rice fields, and adjacent uplands (58 FR 54053). Primary habitat requirements of the giant garter snake include the following: (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, accompanied by vegetated banks for escape cover and foraging habitat during the active season; (3) basking habitat of grassy banks and openings in waterside vegetation; and (4) higher elevation uplands for cover and refuge from flood waters during the snake's winter dormant season (Hansen and Brode 1980, Hansen 1986, USFWS 2012). Throughout its winter dormancy period, the giant garter snake resides in small mammal burrows and soil crevices located above prevailing flood elevations (USFWS 2012). Burrows are typically located in sunny exposures along south- and west-facing slopes (58 FR 54053).

Occurrence records indicate that giant garter snakes are currently distributed in 13 unique population clusters coinciding with historical flood basins, marshes, wetlands, and tributary streams of the Central Valley (Hansen and Brode 1980; Brode and Hansen 1992; USFWS

1999). These populations are isolated, without protected dispersal corridors to other adjacent populations, and are threatened by land use practices and other human activities, including development of wetland and suitable agricultural habitats. Hansen (1988) reported that although the major permanent waterways of the Delta are apparently unsuitable for the giant garter snake, small backwater sloughs and toe drains support suitable habitat for, and thus could potentially support, small numbers of giant garter snakes.

Within Decker Island and along the shoreline, there are no known documented observations of giant garter snake. According to the CNDDB, there are several sightings within 5 miles of Decker Island. The closest sighting was of an adult in 1998, approximately 1,000 feet across Horseshoe Bend along the shoreline of Sherman Island. On Sherman Island, there have been two sightings approximately 4 miles to the south near the Antioch Bridge, the latest of these two in 2010. Across the San Joaquin River, several sights have been documented on Webb Tract, approximately 5 miles to the west, and on Jersey Island, approximately 3 miles to the southeast.

The most recent confirmed and unconfirmed giant garter snake sightings occurred on Jersey Island at the drought barrier on False River in 2015 and on Sherman and Twitchell islands in 2016. Individuals were observed basking on the road, along the levee, and adjacent to and within the drought barrier construction area. One was also observed on Bradford Island and another one was also found dead on a paved public road that leads to the Jersey Island ferry. On Sherman Island, a snake was observed twice on the Setback Habitat Levee along Mayberry Slough on the southern edge of the island in March of 2016, and on the levee on the southeast corner of Twitchell Island.

Western Pond Turtle

The western pond turtle is usually found in still or slow-moving freshwater habitats and sometimes in brackish habitats. Primarily found in natural aquatic habitats, the species also inhabits impoundments, irrigation ditches, and other artificial water bodies with suitable basking sites, underwater cover, and riparian vegetation (Zeiner et al. 1990a). Upland habitats are also important to western pond turtles for nesting, overwintering, and overland dispersal (Holland 1994). Western pond turtles have not been detected on the Project site.

Birds

Special-status species with a high or moderate likelihood of occurring at the Project site under current conditions and after restoration are discussed in detail below.

Special-status bird species found within the study area that have low to no potential to occur due to lack of suitable habitat at the Project site are not considered further in this document. These species include: Ridgway's Rail (*Rallus obsoletus*), Costa's Hummingbird (*Calypte* costae), Lewis' woodpecker (*Melanerpes* lewis), Mountain Plover (*Charadrius montanus*), Western Burrowing Owl (*Athene cunicularia hypugaea*), and Bank Swallow (*Riparia riparia*).

California Black Rail

The California Black Rail is a State Threatened and Fully Protected species as well as a federal Bird of Conservation Concern that resides year-round in northern San Francisco Bay, Suisun Marsh, the Sacramento-San Joaquin Delta, with isolated populations in the Sierra Nevada foothills, Morro Bay, and southeastern California. During winter, the species' range expands to throughout San Francisco Bay and coastal Marin County. The species nest in saline, freshwater, or brackish emergent marshes above the high tide line with adjacent upland refugia, and also use managed emergent marshes or emergent marshes associated with seeps with dense vegetative cover. Within the Project site, suitable nesting and foraging habitat exists in the wetland habitats. Black rail surveys conducted by DFW staff did not detect rails using the Project site.

Loggerhead shrike

Loggerhead shrike, a California Species of special Concern and a federal Bird of Conservation Concern (nesting birds), is a common California resident found in foothill and lowland open upland habitats. In the Project area loggerhead shrike would use valley foothill riparian habitats for nesting which occurs from May to August (Zeiner et al. 1990b). On the Project site, suitable riparian nesting habitat and upland foraging habitat are present.

Northern Harrier

Northern harrier, a California Species of Special Concern (nesting birds), is a marsh-associated ground-nesting bird that is commonly found within the Delta year-round. The breeding population now appears to be restricted to north coastal lowlands, the central coast, the northern Central Valley, Klamath Basin, and Great Basin (MacWhirter and Bildstein 1996; Davis and Niemela 2008). Meadows, marshes, and wetlands are optimal habitat types; other suitable habitats include grasslands, ungrazed or lightly grazed pastures, and grain fields (Davis and Niemela 2008). Northern Harriers nest on the ground in shrubby vegetation, usually along the edge of marshes. This highly territorial species breeds from April through September, with peak breeding occurring during June and July (Zeiner et al. 1990b). Within the Project site, suitable nesting habitat exists on the dry fringe and higher elevation areas without standing water within the wetland habitat; foraging habitat exists wetland and in grassland habitat.

Oak Titmouse

The oak titmouse is a federal Bird of Conservation Concern (nesting birds) primarily found in oak woodlands. The species nests in cavities near water from May to July (Zeiner et al. 1990b). On the Project site suitable valley foothill riparian habitat exists for the species for cover, nesting, and foraging.

Short-eared Owl

The Short-eared Owl is a California Species of Special Concern (nesting birds) that breeds throughout the State, including portions of the Sacramento and San Joaquin Valleys, and in northeastern and coastal California. The species nests on the ground among herbaceous vegetation such as the dry fringe and higher elevation areas without standing water within freshwater marsh and seasonal wetlands, wet meadows, fallow fields, and alfalfa fields and forages at night in marshes, grasslands, agricultural fields primarily for voles. Short-eared owls

have not been observed on Decker Island but the mix of wetland and upland habitats the species uses for nesting is present.

Song Sparrow ("Modesto" population)
The "Modesto" population of song sparrow (hereafter referred to as Modesto song sparrow), is ubiquitous in the Delta. Modesto song sparrow, a California Species of Special Concern, was a valid subspecies until 2001 and may be again after additional taxonomic analysis (Gardali 2008). The population is endemic to the north-central portion of the Central Valley and the Bay-Delta is one of two areas with the highest population densities. The Modesto song sparrow occupies wetland, riparian, and scrub habitats, as well as most agricultural habitats along associated drains. Emergent marsh and riparian scrub provide primary nesting habitat. Within the Project site, suitable nesting and foraging habitat exists in the wetland, valley/foothill riparian, and ruderal grassland habitats. The Modesto song sparrow has been found on Decker Island.

Swainson's Hawk
Swainson's Hawk is a California Threatened species and a federal Bird of Conservation Concern (nesting birds) whose nesting range includes the Central Valley, northeastern California, and the Great Basin, and migrates south during winter. Swainson's Hawks nest primarily in mature riparian trees with relatively dense canopies such as oaks or cottonwoods, also in scattered or isolated trees in rural or residential areas near foraging habitat (Schlorff and Bloom 1984; England et al. 1997). They forage in grasslands and in agricultural lands such as alfalfa, irrigated pasture, and grains. Swainson's hawk have been observed on Decker Island. Large cottonwood trees onsite could provide nesting habitat and the upland areas of the island could also provide foraging habitat.

Tricolored Blackbird
The tricolored blackbird is a California Candidate species for being listed as threatened or endangered. Previously the species was listed as a California Species of Special Concern for nesting colonies. With the exception of a few small populations, the tricolored black bird is a native of California. It is found using wetlands, willow thickets, or blackberry brambles for nesting from March to August (Beedy 2008). The nesting colony is typically located in close proximity to foraging habitat which are typically grain fields, alfalfa, grazed grasslands, as well as cattle feedlots and dairies (Beedy and Hamilton 1999). Neither tricolored blackbirds nor their nesting colonies have been detected on site. On the Project site, appropriate nesting and foraging habitat exists, however, the amount and quality of foraging habitat is not sufficient to sustain all but a small nesting colony.

White-tailed Kite
White-tailed kite is a State Fully Protected species (nesting birds) distributed throughout the western hemisphere; however, the majority of North American residents occur in California. They inhabit low foothills or valley areas with Valley or live oaks, riparian areas, and marshes near open grasslands and agricultural areas for foraging. Nesting occurs in trees with dense canopies located near foraging habitat from February to August. Within the Project site, white-tailed kite have been observed. Marshes and open grasslands used for foraging are present.

Yellow Warbler

Yellow warbler, a California Species of Special Concern and a federal Bird of Conservation Concern (nesting birds), is a summer resident that breeds throughout much of California, except the Central Valley, southern Californian deserts, and high Sierra Nevada (Zeiner et al. 1990b; Heath 1998, 2008). The species has been extirpated from most of the southern Sacramento and San Joaquin valleys. The preferred habitat of Yellow warbler includes open-canopy or deciduous riparian vegetation, often along streams or wet meadows (Heath 2008). This species frequently nests in small willows and alders, and is also associated with cottonwoods, Oregon ash, and other riparian shrubs and trees, depending upon the geographic region (Zeiner et al. 1990b; Heath 2008). Breeding occurs from mid-April through early August, with peak activity in June (Zeiner et al. 1990b). Yellow warbler has been observed on Decker Island.

Yellow-billed Magpie

Yellow-billed magpie is a federal Bird of Conservation Concern for nesting birds and communal roosts. The species is a year round resident of the Central Valley and the coast range from the San Francisco Bay area to Santa Barbara. Yellow-billed magpie nest from February to July in large bulky nests high in large trees (Zeiner et al. 1990b). Magpies prefer open riparian woodland or agricultural lands in the Project vicinity. The species has been observed on the Project site and nesting habitat is present.

Mammal

Western red bat

The western red bat is listed as a California Species of Special Concern and occurs throughout the Central Valley. The western red bat is closely associated with riparian habitat, especially mature stands of cottonwood and sycamore, which provides suitable roosting sites in trees and sometimes shrubs. There is evidence for seasonal movements by western red bats in California, but little evidence for mass migration characteristics (Pierson et al. 2006). The distribution of males and females in California differ seasonally. Males are dispersed throughout the State during maternity season, while females are concentrated in the Central Valley (Pierson et al. 2006). Based on the habitat requirements of western red bats for breeding and the vast majority of breeding records for the species occur in the Central Valley, it is possible that the western red bat uses the Project site; however, the species has not been documented on Decker Island.

3.4.2 Discussion

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less-than-significant with mitigation incorporated

Special Status Plants

During the 2015 plant surveys, several special status plants were observed in and around the project site. These include Delta Tule Pea, Mason's Lilaeopsis, Suisun Marsh Aster, and California Hibiscus. All accounts of these species were located on the exterior of the island levees. Construction activities like the widening of the south breach and northern levee degrade could directly impact special status plant species by displacement during excavation; however, no special-status plants were identified in the construction areas. Mitigation Measure Bio-1 below is proposed in the event that an undetected plant is discovered during construction and would reduce impacts to less than significant.

> **Mitigation Measure Bio-1: Avoid and minimize impacts to special status plants.** A qualified biologist shall conduct pre-construction surveys for special status plants; if any are identified in the disturbance areas they shall be flagged and avoided. If any special status plants cannot be avoided other than Antioch Dunes Evening-primrose or Mason's Lilaeopsis, an attempt shall be made to transplant the individuals after consultation with CDFW and USFWS. Antioch Dunes Evening-primrose and Mason's Lilaeopsis shall be avoided.

Special Status Fish

Culvert and riprap removal, and subsequent breach widening, could result in direct and indirect temporary impacts to special-status fish. Indirect impacts include increases to sediment loads or chemical spills in the aquatic habitat surrounding the Project site, which can reduce fitness, increase metabolic demand, and reduce foraging ability. Direct impacts include gill damage, body damage, and/or mortality from sediment or construction equipment. Direct and indirect impacts would be avoided for most special-status fish by implementing mitigation measure Bio-2 below. The proposed in-water work window in Mitigation Measure Bio-2 coincides with timeframes set by USFWS, NMFS, and CDFW for when special-status species are least likely to occur in the Delta. Beach seining results on Decker Island (Rockriver 2008) and just upstream of Decker (Table 10; USFWS 2016) suggest juvenile salmonids would not be present along the shoreline in the fall during in-water construction activities. A few adult salmonids could be present as they migrate upstream but they would likely be in the main stem of the Sacramento River and not significantly affected by construction activities on the inside bend of Horseshoe Bend.

Although Green Sturgeon and White Sturgeon could be present in the waters surrounding Decker Island, they are benthic species that are typically found in the deep channel habitats. It is unlikely that juvenile and adult sturgeon would be foraging along the shallow shoreline of

Decker Island when construction activities are occurring during daylight hours. Juvenile Green Sturgeon are primarily nocturnal during downstream migrations and when foraging (Kynard et al. 2005). If in Horseshoe Bend, sturgeon would likely occur in the large, deep hole located in the outside of bend of Horseshoe Bend, near Sherman Island, and outside the influence of construction activities.

Delta Smelt, Longfin Smelt, Splittail, Hitch, and to a lesser extent, lampreys could be present year-round near Decker Island. Smelt and Splittail tend to be more locally abundant during the spring as larvae and juveniles and less abundant during the fall when they move downstream to their nursery habitats (Table 9; Dege and Brown 2004; CDFW 2016). During the proposed in-water work window, Delta Smelt in the vicinity of Decker Island would typically be in the 20-60 mm fork length range (Figure 11). By a length of 20 mm, Delta Smelt are considered juveniles with the ability to actively swim. Therefore, despite Delta Smelt presence near Decker Island during construction activities, it is not likely that direct impacts would occur to smelt. Additionally, smelt are a more pelagic species and they would not likely occur in high numbers in the weedy shoreline of the construction footprint. Similar to Delta Smelt, juvenile Longfin Smelt, Hitch and Splittail would be able to swim away from in-water construction activities. They also tend to be locally less abundant in the warm fall months. Otter trawl sampling in the Sacramento River also suggests juvenile lampreys are less abundant in the fall (CDFW 2016); the fall in-water work window would also provide some level of protection to lampreys.

Underwater noise generated from construction equipment would likely deter fish movement into the channel leading to the breach location. In addition, construction activities would occur during low tide, which would set construction activities away from wetted areas. The limited in-water construction at the breach location would be accompanied by a silt curtain (See Mitigation Measure WQ-1) which provides an additional barrier to fish movement into the construction area. In addition, Mitigation Measures HM-1 and HM-2 provide a spill response plan and material that would limit the potential for chemical impacts to special status species. With mitigation above mitigation measures implemented, impacts would be less than significant.

Mitigation Measure Bio-2: In-water Work Window

All in-water work shall be limited to August 1 through October 31, a timeframe set by CDFW, USFWS, and NMFS as a time when special status fish are least likely to be present.

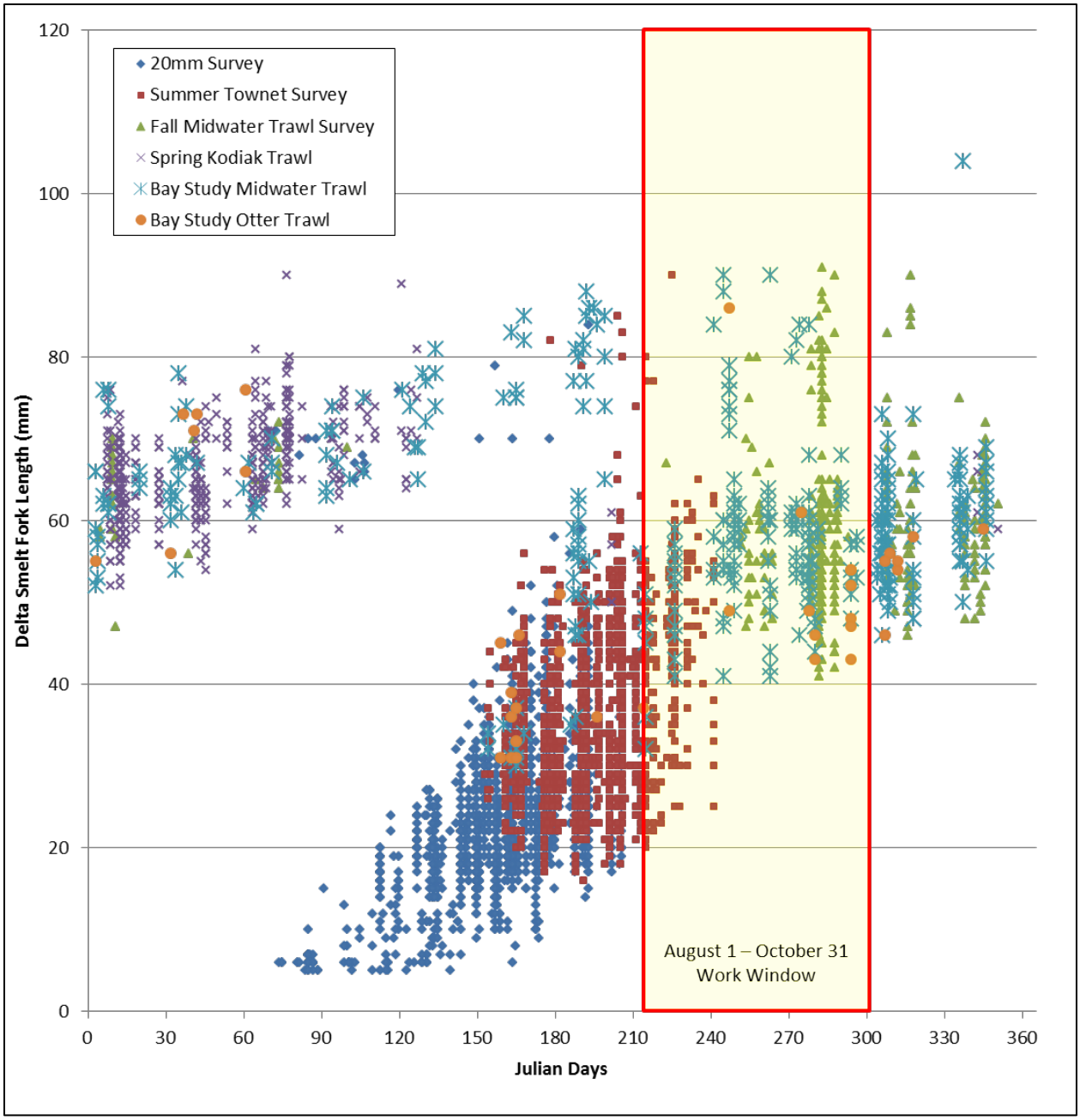

Figure 11. Delta Smelt size classes that could potentially be affected by Project activities during the in-water work window at Decker Island. Delta Smelt lengths are from IEP monitoring program stations near Decker Island, from 1995-2015. See Table 9 for station information.

Special Status Wildlife

Table 12 shows there are numerous special status wildlife species with potential to occur on site. Soil movement, excavation, and staging areas could directly impact burrows, nests, and nesting potential associated with special status wildlife species. Vehicle movement along the cross levee and in upland areas with Decker Island could also cause direct mortality to

terrestrial species. However, through a combination of avoidance windows and minimization measures, impacts would be reduced to less than significant.

Valley Elderberry Longhorn Beetle

A special status plant survey conducted by CDFW on June 6, 2015, identified seven locations on or adjacent to the Project site that had valley elderberry shrubs. Two shrubs were on the Horseshoe Bend levee, three were along the interior property boundary on the western edge of the site, and 1 was located near the levee on the southern boundary of the site (Figure 10). Most of these shrubs were surrounded by a dense understory of California rose and/or blackberries making them inaccessible for valley elderberry longhorn beetle (VELB) surveys. It is unlikely that VELB are present based on their known distribution in the Delta (CNDDB accessed March 2016; 79 FR 55874) and the relatively isolated nature of the elderberry shrubs on the island.

Because the valley elderberry longhorn beetle is not likely present on Decker Island, there would be no direct or indirect effects to the beetle. To protect potential future beetle habitat from construction related activities, there would be a biological monitor on site (Mitigation Measure Bio-3), all construction personnel would go through environmental awareness training (Mitigation Measure Bio-4), and the existing elderberry shrubs would be clearly identified with fencing and/or flagging (Mitigation Measure Bio-5). These elderberry shrubs would not be removed as part of the Project.

> **Minimization Measure Bio-3: Biological Monitor**
> A CDFW, USFWS, and NMFS approved biological monitor knowledgeable and experienced in the biology, life history, and identification characteristics of fish, wildlife, and plant resources with potential to be encountered during Project activities shall be present during all construction activities and shall have the authority to halt work if concern over fish, wildlife, or plant resources becomes apparent.
>
> **Minimization Measure Bio-4: Environmental Awareness Training**
> Environmental awareness training shall be conducted by a CDFW and USFWS approved biological monitor for all construction personnel prior to commencement of construction activities. This training shall include a brief overview of the life history of special status species likely to be encountered onsite, legal protections and penalties for unauthorized take, and explain the relevant Environmental Commitments and Mitigation Measures.
>
> **Mitigation Measure Bio-5: Valley Elderberry Longhorn Beetle Protection Measures**
> DWR shall consult with the USFWS regarding the elderberry shrubs on the Project site that are located within 100’ of construction activities (the 7th plant is located approximately 1,500’ from the nearest activity and would not be affect by construction activities).
>
> The four elderberry plants located along the fence line and road separating the Project site from DI Aggregates property, and the 2 plants near the levee lowering site shall be

fenced and flagged prior to construction activities. DWR shall provide a minimum setback of 20 feet from the dripline of each elderberry plant.

Each plant location shall have a sign along the edge of the avoidance area with the following information: “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.” The sign should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

Giant Garter Snake

Although no giant garter snake have been documented on the Project Site, they have been documented across Horseshoe Bend, on Sherman Island, and to the southwest on Webb Tract and Jersey Island.

To help lessen potential adverse effects to giant garter snake, upland ground disturbing construction activities within giant garter snake habitat would occur between May 1 and October 1 when the snake is most active and could actively move and avoid danger. DWR would consult with CDFW and USFWS if construction activities would occur in potential giant garter snake habitat between October 1 and April 30. Under this scenario, ground disturbing activities would be initiated prior to October 1 and would continue into October until construction activities are completed, no later than October 31.

The following site preparation and construction activities have the potential to cause injury or mortality to giant garter snakes:

- Clearing and grubbing of vegetation,
- Creation of temporary roads, ramps, stockpile, and staging areas,
- Removal and re-contouring of berms,
- Blocking or filling agricultural ditches,
- Excavation of levee breaches,
- Levee lowering.

The aforementioned activities could fill or crush burrows and crevices; obstruct snake movement; decrease prey base; and result in the direct disturbance, displacement, injury and/or mortality of giant garter snakes. Existing roads would be used to the extent possible. Any new roads, turn-arounds, and staging areas would be returned to their original state, where practical, and reseeded with native grasses (Mitigation Measure Bio-6).

Construction during the giant garter snake active season would allow the snake to have time to move out of harm’s way and/or out of habitat that would be impacted by heavy equipment. A pre-construction survey of the work site would occur before construction activities begin (Mitigation Measure BIO-7). Biological monitors would check equipment parked overnight if the equipment was not enclosed by snake proof fencing. If authorized by the USFWS and CDFW, a

qualified biologist could move any giant garter snake in imminent danger to a nearby area outside the construction zone with suitable garter snake habitat.

An accidental chemical and/or petroleum spill during construction could result in morality or injury of giant garter snake and prey species. Implementation of Mitigation Measures HM-1 and HM-2 would greatly reduce this potential adverse effect to giant garter snakes.

Levee breaching and levee lowering could remove potential overwintering habitat. Approximately 0.5 acres of upland habitat would be converted to wetland and open water through levee lowering and breach enlargement. In addition to constructed features, approximately 21 acres upland habitat will be converted to high marsh. However, this upland area is flooded during wet years and would not provide suitable overwintering habitat for giant garter snake. Approximately 22 acres of upland habitat above the mean high water mark would still be available on the Project Site and approximately 400 acres of upland habitat would be available on the adjoining property. The amount of upland habitat removed (0.1%) from levee lowering and breaching would be insignificant due to the amount of upland habitat still available in the adjoining property. Any riparian habitat impacts along the levee would be fully mitigated on site (Mitigation Measure Bio-11).

After project completion, a mosaic of tidal habitats, including emergent wetland, edge-water, and upland habitats would be available to giant garter snakes, much as there is now. Although there would be increased inundation on the site and slightly increased velocities at the northern levee degrade and the southern breach, the tidal velocities on a majority of the site would remain unchanged from current conditions as the existing topography and tules would still provide slower, edge-water habitats. It is anticipated that the site would continue to provide suitable tidal wetland habitat with emergent vegetation and backwater habitats and a range of foraging opportunities for giant garter snakes.

Mitigation Measure Bio-6: Giant Garter Snake Construction BMPs
Standard construction BMPs, such as those listed below, shall be implemented for all phases of the Project regardless of work window:

- Staging areas shall be fenced with exclusionary fencing.
- If a giant garter snake is identified within the work zone, work shall not proceed until the snake has moved, on its own, out of the work zone.
- Vehicles and heavy construction equipment shall be confined to designated transportation routes and shall be limited to 15 miles per hour.
- Construction shall be confined to the minimal area necessary for Project activities. Environmentally sensitive areas will be flagged for avoidance.
- Non-entangling erosion control measures shall be implemented for all erosion control practices.
- After completion of construction activities, temporary fill shall be removed and the area reseeded with native grasses and forbs as appropriate.

- All construction activities shall occur in the daytime when giant garter snakes are more easily observed.

Mitigation Measure Bio-7: Giant Garter Snake Work Window and Surveys
Ground disturbing work shall be limited to the May 1- October 1 window. This is the active period for giant garter snakes, when they would most likely be able to avoid construction activities. If ground disturbing activities were initiated before October 1, they may continue beyond October 1 provided that breaks in construction periods have not exceeded 2 weeks. A daily pre-construction survey for giant garter snake shall be conducted immediately prior to construction. Construction personnel shall be alerted during a tailgate meeting that giant garter snake may be present in the area and should be avoided.

Western Pond Turtle
The Project site contains wetland and upland habitat for western pond turtles, although they have not been found on site. Project construction could impact western pond turtle through direct mortality. To avoid direct impacts, the area would be surveyed daily prior to construction activities (Mitigation Measure Bio-8) and a biological monitor will be onsite during all construction activities (Mitigation Measure Bio-3). After construction the project is expected to be beneficial to western pond turtle as wetland habitats would increase by 22 acres. Although upland habitat will decrease, sufficient nesting habitat would remain onsite for the turtle and would not impact the species.

Mitigation Measure Bio-8: Western Pond Turtle Surveys
A pre-construction survey for western pond turtles shall be conducted by a qualified biologist prior to daily construction activities. Construction personnel shall be alerted during a tailgate meeting that western pond turtles may be present in the area and should be avoided. If a western pond turtle is identified within the work zone, work shall not proceed until the turtle has moved, on its own, out of the work zone.

Nesting Birds
Several species of birds may use the Project site as nesting habitat. Nests could be located in wetland, riparian or upland grassland habitats. Site preparation and construction activities have the potential to impact nesting birds during the nesting season through either direct nest mortality or disturbance causing abandonment of nests. Nesting bird surveys will be completed prior to any site preparation or construction that would take place during the nesting season (Mitigation Measure Bio-9).

After construction the site will function for birds much as it does now. There would still be a mosaic of habitats available for use for nesting and foraging. Upland habitat will decrease approximately 21 acres and be converted to high marsh. The high marsh habitat that would replace the upland is a much rarer and more widely used habitat by the bird species on Decker Island. There is also an additional 400 acres of upland habitat available on Decker Island. The conversion of this upland habitat is expected to have no impact on listed species.

There is also 1.2 acres of valley foothill riparian and riparian scrub shrub that would be impacted and converted to wetland or open water. Impacts to riparian trees shall be mitigated for at a 3:1 ratio and riparian scrub shall be mitigated for at a 2:1 ratio through on-site mitigation (Mitigation Measure Bio-11).

Minimization Measure Bio-9: Nesting Bird Surveys
This mitigation measure includes the following:

- Site preparation and construction activities should take place outside of nesting season (February 15–August 15) to avoid take via disturbance or destruction of nests or mortality of individuals. If work begins before this period and continues uninterrupted throughout the nesting season, the consistent disturbance may deter birds from nesting at the site and prevent take.
- If work must take place during March 15 – August 15, a preconstruction survey would be conducted within 14 days prior to the initiation of construction activity by a qualified biologist to identify nesting Swainson's Hawks within ½ mile of the construction footprint. If active Swainson's Hawk nests are found, appropriate non-disturbance buffers and avoidance measures would be developed in coordination with CDFW to avoid disturbance of nesting Swainson's Hawks based on individual bird behavior and construction-related disturbance that occurs. Surveys shall be repeated if a lapse in construction of 14 days or greater occurs. Surveys would be repeated annually if work takes place during subsequent nesting seasons.
- If work must take place during March 15–August 15 and use of non-disturbance buffers is infeasible, a qualified biologist shall be on site to monitor active nests. Monitoring requirements would be established in coordination with CDFW. Monitors would have authority to stop work if it appears that Swainson's Hawk nests are disturbed by construction activity, and CDFW would be contacted for further guidance.
- If work must take place during April 1–August 15, a preconstruction survey would be conducted within 14 days prior to the initiation of construction activity to identify nesting raptors within 500 feet, and other nesting birds within 100 feet of the construction footprint. Appropriate non-disturbance buffers would be established until nestlings have fledged. Surveys shall be repeated if a lapse in construction of 14 days or greater occurs during the nesting season.

Bats
Western red bat and other bat species utilize trees such as the large, mature cottonwoods on the Project site as roosting habitat. Clearing of riparian vegetation has the potential to impact roosting habitat for western red bat. To avoid impacts to roosting bat or maternity colonies, trees would be surveyed prior to disturbance or removal (Mitigation Measure Bio-10).

Mitigation Measure Bio-10: Bat Habitat Assessment and Avoidance
A habitat assessment shall be conducted by a qualified biologist for bats at work sites where trees would be removed or otherwise disturbed for a period of more than 2 hours. The habitat assessment shall include a visual inspection of features within 50 feet of the work area for potential roosting features (bats need not be present) no more than 48 hours prior to disturbance of such features. Habitat features found during the survey shall be flagged or marked. All assessment results shall be submitted to CDFW for review. If bats (individuals or colonies, not just roosting habitat) are detected during the habitat assessment, CDFW shall be notified immediately.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?
Less than significant with mitigation incorporated
The Project is designed to restore and enhance freshwater tidal wetlands and would have a beneficial impact on sensitive natural communities that have been identified in regional plans as important for restoration. However in order to accomplish this, 1.2 acres of riparian and riparian-scrub would be removed and permanently converted into wetland and open water to widen the southern breach and allow for full tidal access onto the Project site. With the mitigation measure below, impact would be less than significant.

Mitigation Measure Bio-11: Riparian Habitat Mitigation
For permanent impacts to riparian habitat that cannot be avoided, loss of riparian trees shall be mitigated for at a 3:1 ratio and riparian scrub shall be mitigated for at a 2:1 ratio through on-site mitigation. A revegetation plan shall be prepared by a qualified biologist and reviewed by appropriate agencies prior to the removal of existing vegetation. The revegetation plan shall identify the appropriate replanting stock and shall employ the most successful techniques available. The plantings shall be maintained for 5 years and replanted if necessary. All plantings shall have a minimum of 80% survival at the end of 5 years and shall attain 70% cover after 3 years and 75% coverage after 5 years. Permittee is responsible for replacement planting, additional watering, weeding, invasive plant eradication, or any other practice to achieve these requirements. Permittee shall monitor the replacement plants for the aforementioned survival and growth requirements for 5 years after planting. If the on-site mitigation fails, Permittee will be required to fully mitigate the loss of habitat at an off-site location.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?
Less-than-significant with mitigation incorporated
Due to Decker Island having established emergent marsh and muted tidal access, there would be potential for impacts to federally protected wetlands. Temporary impacts would occur by means of direct fill from berm access and reshaping. The berms were delineated as upland but

are located within the wetland and are impeding the flow of water on and off the site. These berms currently cannot be accessed without impacting emergent vegetation and crossing a historic channel.

Due to the location of these structures within the established wetland, temporary culvert crossings would be constructed so that heavy machinery would not need to be operated within the water or emergent vegetation. Up to two temporary crossings would be constructed within a small onsite channel and removed upon completion of berm excavation. Crossings would only be large enough to facilitate equipment access to the berms.

After constructing the access culverts, the berms would have notches excavated and then deposited and reshaped into habitat mounds adjacent to the excavator (See Figure 2). These mounds would transition from intertidal habitat to upland refugia. While wetland habitat is impacted by depositing excavated material, an equal area of wetland habitat, albeit bare, is created by the excavation. The surrounding emergent vegetation would quickly recolonize bare areas and result in a zero net loss of wetland and upland habitat for this Project activity.

The Proposed Project would reclassify 90.2 acres of muted tidal wetland into tidal wetland and result in a net increase in 22 acres of wetland habitat (Figure 2 and Table 2 in Project Description). While ultimately a beneficial impact, the mitigation measure below aims to address potential temporary impacts from construction. With the mitigation measure below incorporated, there would be a net increase in acreage and function of federally protected wetlands and protection of current onsite resources; therefore, impacts would be less than significant.

> **Mitigation Measure Bio-12: Minimize Temporary Impacts to Wetlands**
> Temporary loss of wetlands shall be minimized by utilizing construction equipment from upland berms and levees wherever possible. Vehicular traffic shall be limited to existing or designated transportation routes along upland levees and berms. When constructing temporary crossings, low ground pressure vehicles or fiber mats shall be placed across aquatic habitat to maintain subsurface elevations upon removal.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less-than-significant with mitigation

Wildlife

There is potential for the Project to interfere with the movement of native resident or migratory wildlife or wildlife nursery sites. A great blue heron rookery is located on the southern levee of the Project area (Figure 4). The rookery extends approximately 750 feet along a Fremont's Cottonwood forest stand with 27 active nests counted by CDFW employees in a February 2016 survey. However, it is not expected that the rookery would be impacted by Project activities as the rookery is over 800 feet away from the closest construction activity, well outside the 500 foot construction buffer typically imposed by CDFW. In addition, there would be pre-construction surveys (Bio-7 through Bio-10), Environmental Awareness Training (Bio-4), and a biological

monitor (Bio-3) present during all phases of construction. Active nests would be monitored during construction and the biological monitor would have the ability to halt work if there is evidence of disturbance among nesting birds. With the above mitigation measures incorporated, impacts to native resident or migratory wildlife and wildlife nursery sites would be less than significant.

Fish

There is the potential for the Project to interfere with the movement of native resident or migratory fish; however, it is not expected that this interference would be significant. During construction activities, fish in Horseshoe Bend may be temporarily disturbed by waterborne sound and vibrations from in-water work during breach widening. Adherence to in-water work windows identified in Bio 2 and constructing during low tide would avoid impacts to migratory fish swimming near the Project site in Horseshoe Bend. Although migratory native fish use Horseshoe Bend, the most direct route upstream and downstream on the Sacramento River is via the main shipping channel on the west side of Decker Island. The Project and construction activities would have an insignificant effect on water flow and quality in the waters surrounding the island, especially in the SRDWSC. The volume of water flowing on and off the restoration site is insignificant relative to the volume of water in the Sacramento River; therefore, migratory fish passage would not be affected by Project activities and impacts would be less than significant.

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

No Impact

The Project is designed to enhance and expand habitat for native fish, wildlife, and wetland habitat within Decker Island. The Project would not conflict with any local policies or ordinances protecting biological resources; therefore, there would be no impact.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No impact.

There is a Habitat Conservation Plan (HCP) within Solano County (Solano Multispecies Habitat Conservation Plan), but the Project would not conflict with the HCP; therefore, there would be no impact.

3.5 Cultural Resources

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?				x
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?				x
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				x
d) Disturb any human remain, including those interred outside of formal cemeteries?		x		

Environmental Setting

Plains Miwok

The project area falls within the western edge of traditional Plains Miwok (also Me-wuk) territory (Levy 1978), but may overlap into traditional Patwin territory. The eastern Miwok, and more specifically the Plains Miwok, inhabited the lower reaches of the Mokelumne and Cosumnes Rivers, and the banks of the Sacramento River from Rio Vista to Freeport (Levy 1978). The Plains Miwok village comprised various structures including houses constructed of poles arranged in a conical framework with a thatch of brush, grasses, or tule matting. Semi-subterranean, earth-covered dwellings served as winter homes. Also within the Miwok settlement were assembly houses, sweathouses, acorn granaries, menstrual huts, and conical grinding huts over bedrock mortars (Levy 1978).

Patwin

Patwin is a division of the Wintun language stock belongs to the Penutian language family. The word Patwin means “people” in the local Wintun dialect. It is used by ethnographers to refer to the southernmost group of Wintun while “Nomlaki” refers to the central Wintun and “Wintu” can also refer specifically to the northernmost group of Wintun. The Patwin occupied most of Yolo and Solano Counties, residing in large villages along the Sacramento River, Cache Creek, and Putah Creek. The villages clustered around these perennial waterways.

Regional History

The region around the project area was first influenced by the Spanish Missions which have baptism records for many Patwin and Plains Miwok. When the Spanish government fell to the Mexicans, large land grants were made in the interior regions of the Central Valley. In 1844, the Mexican government granted the Rancho Los Ulpinos, an area west of the Sacramento River around the vicinity of present day Rio Vista, to John Bidwell (DPR 1976). By 1848, when gold was discovered at Sutter's mill in Coloma, only a handful of people had settled in the Delta, but thousands of newcomers traveled Delta waterways on route to the foothill and mountain mines to the east. Some California newcomers decided that farming to feed the growing population of miners was a surer path to success. Farmers began to work land at the edge of the Delta along the natural levees of the major rivers.

The Swampland Act of 1850 enabled groups of small landholders to establish districts to undertake Delta land reclamation. Speculative, large-scale land reclamation brought thousands of Chinese workers to the Delta. Their labor first enabled the construction of levees and then helped the islands created by such reclamation efforts yield abundant produce (Garone 2011; Thompson 1957). From the 1860s through the 1880s, reclamation spread agriculture from alluvium lands upstream into the peat lands of the central Delta. With river access to a growing urban market in San Francisco, Delta agriculture boomed and crops were diversified.

Site History

The first government survey of the project area was undertaken by the General Land Office in 1862; however Decker Island is not depicted in the resulting map. The land on both sides of the river is labeled "Swamp and Overflowed Land". There is also no island depicted in the Sacramento River on the Thompson and West Map of Solano County 1877, just a marshy border along the Solano County side of the River; however, the State of California still had the island surveyed in 1877. At that time is was 79.98 acres and was sold to John Decker by patent of Swamp and Overflowed Lands (#1163).

The next owner of the island was Catherine Nelson who reportedly also bought the island from the State as State Land Survey #1071; she owed taxes beginning in the 1883 fiscal year. A notice to Quiet Title ran in the Sacramento Daily Union on June 21, 1896. R. W. Hanson commenced a suit in Superior Court against the Nelsons for Decker Island. The island was transferred to Roscoe W. Hanson in 1896 as reported by the Union in a notice titled "Real Estate Transfers". It states there was a land transfer from, "J.J. Bottget to R.W. Hansen-Survey No. 1071 known as Decker Island". It appears land disputes began shortly after this acquisition. A newspaper account of the land dispute from the San Francisco Call (1899) states that the island had been gradually forming westward since 1855 and that it continued to grow until it joined a Mr. Glassell's property. Mr. Hansen won the land dispute.

Decker became a larger island after the U.S. government decided to cut off Horseshoe Bend in order to straighten the Sacramento River. In 1907 the California Debris Commission purchased two large dredgers (Kelly 1998), and by 1919 the swampland west of the parcel owned by Hansen was removed to create a straight shipping lane (U.S.War Department 1919). The

original Decker Island parcel owned by Hansen was left as it was, but the area to the west of it became a spoils easement of the Federal government. Spoils from dredging were placed there creating additional above water parcels on Decker Island. The spoils on those parcels currently and historically have been mined for sand.

On the 1910 Jersey Island 7.5' USGS topographic quadrangle, the only built features include two small buildings on the southeastern point of Decker Island and a berm depicted on the northwestern side of the island. It appears that a rectangular reservoir of river water was enclosed by a thin levee to the north. The south and eastern edges of the island were bordered by swampland. The 1952 Jersey Island quadrangle depicts culture and drainage from aerial photographs taken in 1931 and topography from aerials taken in 1949. These maps show a levee running along the eastern and southern perimeter of the island along Horseshoe Bend and continuing north. While it is believed that the levee was built before 1931 as levee like structures appear in the 1910 map, it is unclear when the levee was actually built and it could have been constructed anytime between 1910 and 1949.

Surveys

A records search for the APE was conducted on May 12, 2016 by the staff of the Northwest Information Center of the California Historical Resources Information System at Sonoma State University (See Appendix E). The search encompassed a ¼-mile radius around the project area. The record search reported no cultural resources in the APE or within a quarter mile of the APE. The search also reported two cultural resource surveys had been conducted on the island (Seldomridge and Smith-Madsen 1976; Derr 1994). The 1994 survey area covered the adjacent sand mining parcel only. In addition to the archaeological site location maps maintained at the NWIC, the following documents were reviewed: *Archaeological Determinations of Eligibility* (2012a), *California Inventory of Historic Resources* (1976), and *Directory of properties in the Historic Property Data File for Yolo County (2012).*

DWR archaeologists also reviewed the USGS Historical Topographic Map Collection (http://geonames.usgs.gov/apex/f?p=262:1:0), an 1890 Official Map of Solano County from the Library of Congress (Eager 1890), an 1877 Map of Solano County (Thompson and West 1877), and the California Digital Newspaper Collection for information on Decker Island, the Ancestry.com website, and the Title Report for the property.

A pedestrian survey of the project area was conducted by DWR archaeologists on June 23, 2015. Two cultural resources were found and documented; one is the levee, and the other is the remnants of a late 19th century/early 20th century farming operation. No Native American archaeological resources were found. Visibility at the time of the survey was good as the grass had been mowed or grazed down.

Historic Resources

The two potential historic resources on site include the southeastern levee and the Hansen Farm and Homestead. The levee is along the Horseshoe Bend side of Decker Island on the Sacramento River on the southeastern side of the island and is approximately 12 feet wide at

the top, 135 feet wide at the bottom, and about 8-10 feet high. The length of the recorded segment is 1.7 miles long. As state above, the levee was constructed sometime before 1931, but the exact time is unknown.

Evidence of a historic farming operation owned by Ross Hansen was evident in census reports and historic aerial photographs from 1957, but by 1978 no structures were depicted in aerial photographs. The 2015 pedestrian survey noted a flat rectangular depression, fruit and nut trees, and remnants of a burned structure which are thought to be all that remains of the Hansen homestead and farm.

Evaluation

Historic significance is assessed by applying the National Register of Historic Places (NRHP) criteria. Potential historic properties need to possess both significance and integrity to be considered eligible for inclusion in the NRHP. The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects. Properties eligible for the NRHP can be significant on a national, state, or local level and must meet at least one of the following historical significance criteria:

- Criterion A: Properties that are associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: Are associated with the lives of persons significant in our past; or
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: Have yielded, or may be likely to yield, information important in prehistory or history.

Integrity is determined by applying the seven aspects of integrity to the historic resource: location, design, setting, materials, workmanship, feeling, and association. A resource does not need to retain all seven aspects of integrity, but rather should retain those aspects that reflect the reasons that make it historically significant. The criteria used to find resources eligible for listing in the California Register of Historic Resources (CRHR) (Criterion 1-4) are almost identical to Criterion A-D and resources that meet the eligibility requirements for listing on the NRHP are automatically CRHR eligible.

Discussion

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

No impact

As stated above, two historic resources were observed during a pedestrian survey: the southeastern levee and the remnants of a farming operation. Using the above NRHP criteria for historic significance, the historic levee system and Hansen Farm and Homestead would not be considered a historic resource as defined in Section 15064.5.

Levee
Under Criteria A, the Decker Island levee is associated with small scale agriculture in the Delta, but was not an important part of the economy. Under Criteria B, the levee is not associated with the lives of persons significant in our past. Under Criteria C, the levee does not embody the distinctive characteristics of a type, period, or method of construction, nor does it represent the work of a master, or possess artistic value. Under Criteria D, the levee contains no potential to contribute important information about human history. The levee appears to retain good integrity and does not appear to have been modified. A small area of levee on the northern area of the site would be degraded to internal site elevations; however, this area does not appear to be part of the historic levee. As the levee does not seem to be eligible for inclusion for a historic resource under the NHPA, there would be no impact.

Hansen Farm and Homestead
Under Criteria A, the Hansen Farm and Homestead are not associated with events that have made a significant contribution to the broad patterns of our history. Under Criteria B, neither the Deckers nor Hansens were persons of historic significance. Under Criteria C, the farm and homestead do not embody the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, possess artistic value, or represents a significant and distinguishable entity whose components may lack individual distinction. Under Criteria D, the Hansen Farm and Homestead may be significant for the likelihood of yielding information important in history.

There is potential for there to be subsurface artifacts near the Hansen Farm and Homestead. While there are larger farming equipment, wood, and sheet metal scattered around the suspected site, these are not likely to add much to our understanding of the Decker and Hansen ownerships. The integrity of the farm and homestead are diminished as the surficial nature of the farming artifacts, and lack of association with the known island occupants, are detrimental to the sites integrity. Small artifacts important to history may have become buried during past flood events, but that cannot be determined without subsurface excavation and testing. However, as the Project would not be disturbing or result in a disturbance to, the farm and homestead site, subsurface excavation does not seem necessary. There would be no impact.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?
No impact
No archaeological resources were identified during archival searches and surveys; therefore, there would be no impact.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?
No impact
No paleontological resources or unique geological features were identified during archival searches and surveys; therefore, there would be no impact.

d) Disturb any human remain, including those interred outside of formal cemeteries?
Less than significant with mitigation
No human remains have been identified in the Project area and it is unlikely that human remains would be encountered during construction activities; however, the potential to unearth human remains during constructions still exists. Ground disturbing activities have the potential to result in the discovery or inadvertent damage of human remains and this possibility cannot be eliminated. Implementation of Mitigation Measure CR-1 below would reduce impacts to less than significant.

> **Mitigation Measure CR-1: Impacts to Unknown Human Remains**
> If human remains are found, such remains are subject to the provisions of California Public Resources Health and Safety Code Section 7050.5-7055. The requirements and procedures shall be implemented, including immediately stopping work in the vicinity of the find and notification of the Solano County Coroner. The process for notification of the California NAHC and consultation with the individual(s) identified by the NAHC as the "most likely descendent" is set forth in Section 5097.98 of the California Public Resources Code. Work can restart after the remains have been investigated and appropriate recommendations have been made for the treatment and disposition of the remains.

3.6 Geology & Soils

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

3.6.1 Environmental Setting

Prior to construction of the SRDWSC, the project area was a tidal marsh at the terminus of an intermittent stream draining the Montezuma Hills. In the early 1900s the USACE constructed the SRDWSC and placed over 30 million tons of dredge spoils on the marsh surface which created the western section of the island. The eastern section of the island, which is the Project area, was leveed off from the dredge disposal area and farmed for corn (Thompson 1957).

The soils on the Project Area have been classified as Valdez silt loam, characteristic of alluvial fans (USACE 2013). The Valdez soil series occurs on nearly level alluvial fans and the dredge spoil areas. The soil does not hold excessive salt and has a moderately slow permeability and slow runoff. Erosion can be a concern with this soil type, though no areas are of immediate concerns with the exception of the leaky water control structure. Available water capacity is typically 9 to 11 inches, and the effective rooting depth is 48 to 60 inches.

The project site is located in the Great Valley province which hosts few active faults. The Great Valley is an alluvial plain about 50 miles wide and 400 miles long in the central part of California. Its northern part is the Sacramento Valley, drained by the Sacramento River and its southern part is the San Joaquin Valley drained by the San Joaquin River. The Great Valley is a trough in which sediments have been deposited almost continuously since the Jurassic (about 160 million years ago). Great oil fields have been found in southernmost San Joaquin Valley and along anticlinal uplifts on its southwestern margin. In the Sacramento Valley, the Sutter Buttes, the remnants of an isolated Pliocene volcano, rise above the valley floor. The Rio Vista Fault lies beneath the project site and is classified as a quaternary fault (CGS 2010). The closest “active” fault is the Clayton Fault and is approximately 14.5 miles to the southwest (CGS 2010).

3.6.2 Discussion

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

No impact

Decker Island is not in an Earthquake Fault Zone; therefore, there would be no impact.

ii) Strong seismic ground shaking?

Less than-significant

The project would not involve the building of structures or significant increases in visitation to the Project area. The Department of Conservation’s (DOC) Ground Motion Interpolator puts the probabilistic peak-ground motion of about 33% which is moderate (CGS 2008). The Solano County General Plan (p HS – 31, 2008) shows the Project area outside of the highest potential earthquake damage area. There is no known evidence of

activity on the Rio Vista fault line for the last 1.6 million years (CGS 2010). Therefore, this impact would be less-than significant.

iii) Seismic-related ground failure, including liquefaction?
Less-than-significant
The Solano County General Plan (p HS – 37, 2008) shows the Project area is in an area with a high liquefaction potential; however, the Project does not include any structures and it would not significantly increase visitation to the site. Therefore, impacts would be less-than significant.

iv) Landslides?
No impact
According to the Solano County General Plan (p HS-35, 2008), the Project area does not fall within a landslide susceptible area; therefore there would be no impact.

b) Result in substantial soil erosion or the loss of topsoil?
Less-than-significant
The Project would remove the leaky culvert and enlarge the breach to 130 feet at the top. This would result in larger volumes of water onto and off of the Project site, allowing the possibility for erosion at the breach location. The levees at the breach location are heavily vegetated which may help minimize erosion. Additionally, hydrological modeling (Appendix F) shows that velocities on the island would not be high enough to influence erosion.

The contractor would adhere to requirements of the General Permit for Discharges of Storm Water Associated with Construction Activity General Permit Order 2009-0009-DWQ (Construction General Permit) which may include a Storm Water Pollution Prevention Plan (SWPPP) for control of erosion, sedimentation, and runoff during construction.

The Project would not produce velocities high enough to influence erosion onsite or at the breach location. Adherence to permits would also include stringent measures to control for erosion; therefore, this impact would be less-than-significant.

c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?
No impact
The Solano County General Plan (p HS-35, 2008) shows the site is not susceptible to landslides. The project would not involve import of soils or other materials that could displace subsurface materials. The proposed project would not impact or change the value of any geological resources; therefore, there would be no impact.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

No impact

The Project is a tidal restoration project. Expansive soils would not be a hindrance to Project success, nor would they create a risk to life or property; therefore, there would be no impact.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No impact

The Project is a tidal restoration project and would not include the use of any type of septic or wastewater disposal systems; therefore, there would be no impact.

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3.7 Greenhouse Gas Emissions

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			x	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				x

3.7.1 Environmental Setting

In May 2012, DWR adopted the Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (GGERP), which details DWR's efforts to reduce its GHG emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32). DWR also adopted the Initial Study/Negative Declaration prepared for the GGERP in accordance with the CEQA Guidelines review and public process. The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices. The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

DWR specifically prepared its GGERP as a "Plan for the Reduction of Greenhouse Gas Emissions" for purposes of CEQA Guidelines section 15183.5. That section provides that such a document, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Because global climate change, by its very nature, is a global cumulative impact, an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable." More specifically, "[later project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG emissions reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines § 15183.5, subd. (b)(2).)

Section 12 of the GGERP outlines the steps that each DWR project will take to demonstrate consistency with the GGERP. These steps include: 1) analysis of GHG emissions from construction of the proposed project , 2) determination that the construction emissions from the project do not exceed the levels of construction emissions analyzed in the GGERP, 3)

incorporation into the design of the project DWR's project level GHG emissions reduction strategies, 4) determination that the project does not conflict with DWR's ability to implement any of the "Specific Action" GHG emissions reduction measures identified in the GGERP, and 5) determination that the project would not add electricity demands to the SWP system that could alter DWR's emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

Calculations were performed based on construction equipment use, workforce transport, and material transport (Appendix G). The Project determined via a DWR Consistency Determination (Appendix G) to be consistent with the GGERP.

3.7.2 – Discussion

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than significant

Based on the analysis provided in the GGERP and the demonstration that the Project is consistent with the GGERP, the Project's incremental contribution to the cumulative impact of increasing atmospheric levels of GHGs is less than cumulatively considerable; therefore, impacts are less than significant.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

No impact

The GGERP is in compliance with all applicable plans and policies. This Project is in compliance with the GGERP and all BMPs suggested in the GGERP are either incorporated in the Project description or not applicable to the Project.

3.8 Hazards & Hazardous Materials

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

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
h) Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?		x		

Environmental Setting

Both the California State Water Resources Control Board (SWRCB) GeoTracker and California Department of Toxic Substances Control EnviroStor databases indicate that Decker Island is not a current toxic cleanup site without imminent threat of hazards or hazardous materials.

Discussion

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than significant with mitigation incorporated

Fuel, oil, lubricants, and other potentially hazardous materials associated with construction equipment would be utilized and stored within the Project area. While storage would be limited to upland areas, some construction access would be in or adjacent to designated wetland habitat. Regular transport of vegetation, debris, or fill material could pose a significant environmental impact to wetland and upland habitat; therefore, mitigation measures X.X and Y.Y are proposed. With mitigation incorporated, impacts would be less than significant.

> **Mitigation Measure HM-1: Emergency Response Training and Response Plan**
> All personnel involved in the use of hazardous materials shall be trained in emergency response and spill control. Diesel fuel and oil shall be used, stored, and disposed of in accordance with standard protocols for the handling of each hazardous material. Contracts shall require contractors to prepare and make available for review by DWR, a spill prevention and control plan.
>
> **Mitigation Measure HM-2: Hazardous Material Clean Up**
> Appropriate spill response materials and procedures shall be present on site to properly respond to a spill or contamination. Soil and water contaminated by any hazardous materials during construction shall be properly cleaned up and disposed of.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than significant with mitigation incorporated
Fuel, oil, and lubricants have potential negatively impact the environment if accidentally spilled during construction or at staging areas. Accidental spills in the upland or wetlands of Decker Island could impact wildlife and their associated habitats in and around Decker Island by causing direct mortality or indirect impacts to fitness and survival. Even with regular upkeep and maintenance, there is potential for spills and leaks from construction equipment; therefore, mitigation measures HM-1 and HM-2 are proposed above. With the mitigation incorporated, impacts would be less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?
No impact
The Project site is not located within one-quarter mile of an existing or proposed school; therefore, there would be no impact.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?
No impact
Both the SWRCB GeoTracker and California Department of Toxic Substances Control EnviroStor databases were consulted, in June 2015, to determine if there were any recorded sites of concern within an approximate one mile radius of the Project area (DWR 2014 and DWR 2015b). Records indicate that Decker Island was once the site of a boat landing storage facility owned by the United States Army after World War II. Tetra Tech on August 16, 2007 found “no hazards or potential environmental liabilities identified from the past use by the Department of Defense that would pose an immediate risk to the environment or public”; therefore, there would be no impact.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?
No impact
There are no private or public airports within two miles of the Project site; therefore, there would be no impact.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?
No impact
There are no private or public airports within two miles of the Project site; therefore, there would be no impact.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
No impact

The Project site is located on an island separated from the mainland roads. No impairments to traffic or road closures would occur during construction; therefore, there would be no impact.

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

Less than significant with mitigation incorporated

The Project site is mostly wetland and is not located within a wildland fire area or a high fire hazard zone. However, the staging areas and construction routes would be located in upland areas with dry, weedy vegetation with potential to catch fire. Mitigations measure HM-1 is proposed to reduce the potential for loss, injury, and death associated with wild land fires. With the mitigation incorporated, impacts would be less than significant.

3.9 Hydrology & Water Quality

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?		x		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?				x
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?			x	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?				x
e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			x	
f) Otherwise substantially degrade water quality?				x
g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate map or other flood				x

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
hazard delineation map?				
h) Place within a 100-year flood hazard area structures that would impede or redirect floodflows?				x
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?				x
j) Contribute to inundation by seiche, tsunami, or mudflow?				x

Environmental Setting

Decker Island is located in a region of California characterized by a Mediterranean-type climate. Precipitation exists entirely in the form of rain with an average annual precipitation of 15 to 25 inches, most of it falling between November and March (Life Science! 2013).

Hydrology is influenced by precipitation, tidal forces, and flood flows. The Project site is located in the Sacramento River and Horseshoe Bend, and is connected by an eroded agricultural culvert. The culvert, in combination with historic agricultural ditches and drainage swales, brings water to the island interior and contributes to the establishment of the current emergent marsh habitat. A rocked weir with an eroded culvert and interior berms restrict water on and off of the island. The habitat is considered muted tidal with water not getting much higher than mean high water (5.8 feet). Most of the site is at intertidal elevation, increasing in elevation from southwest to northeast (See Figure 12-14). Hydrologic modeling for various Project designs was completed and is available in Appendix F.

Figure 12. Jurisdictional waters and wetlands in the Project area

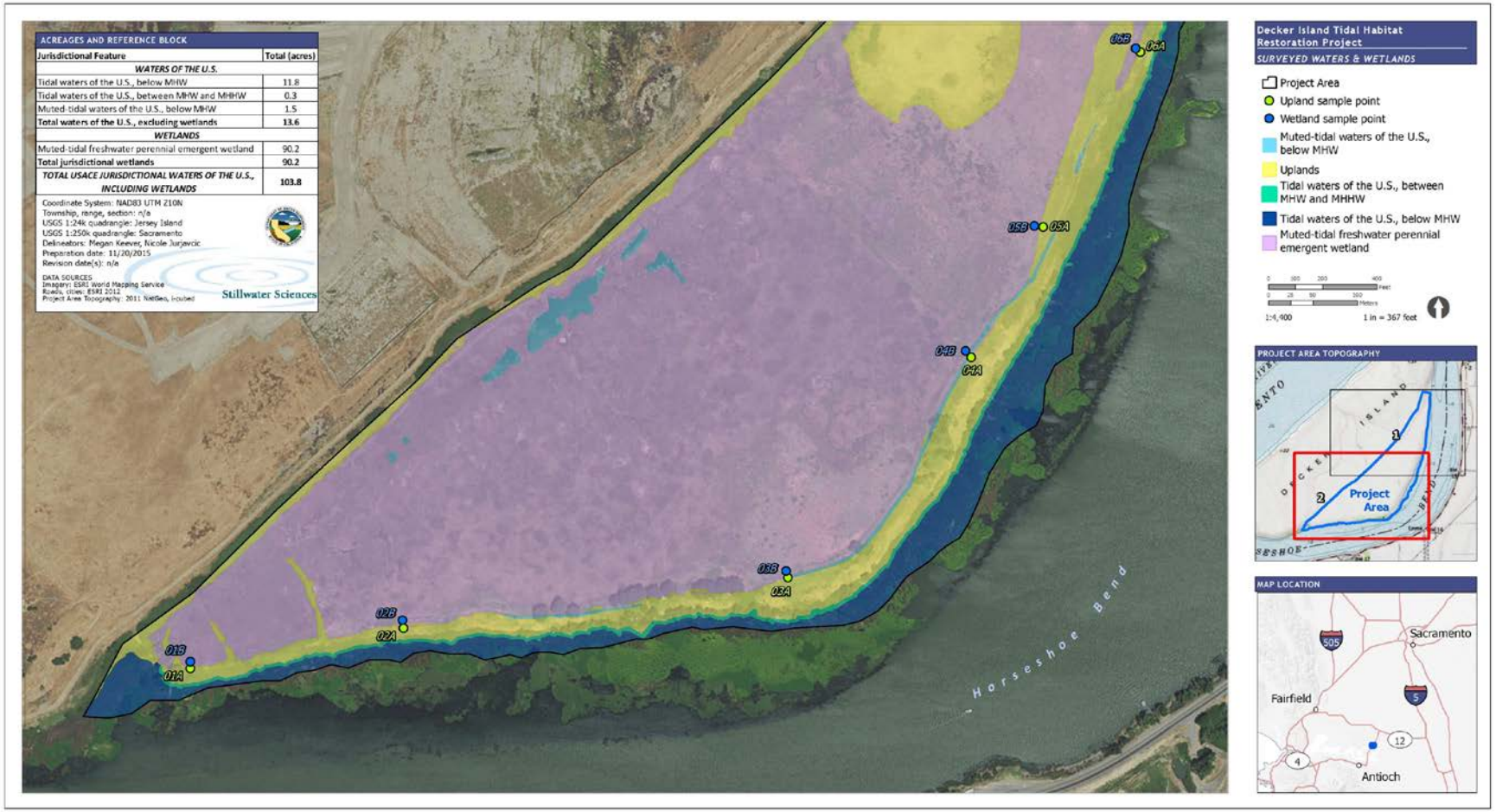

Figure 13. Jurisdictional waters and wetlands in the Project area

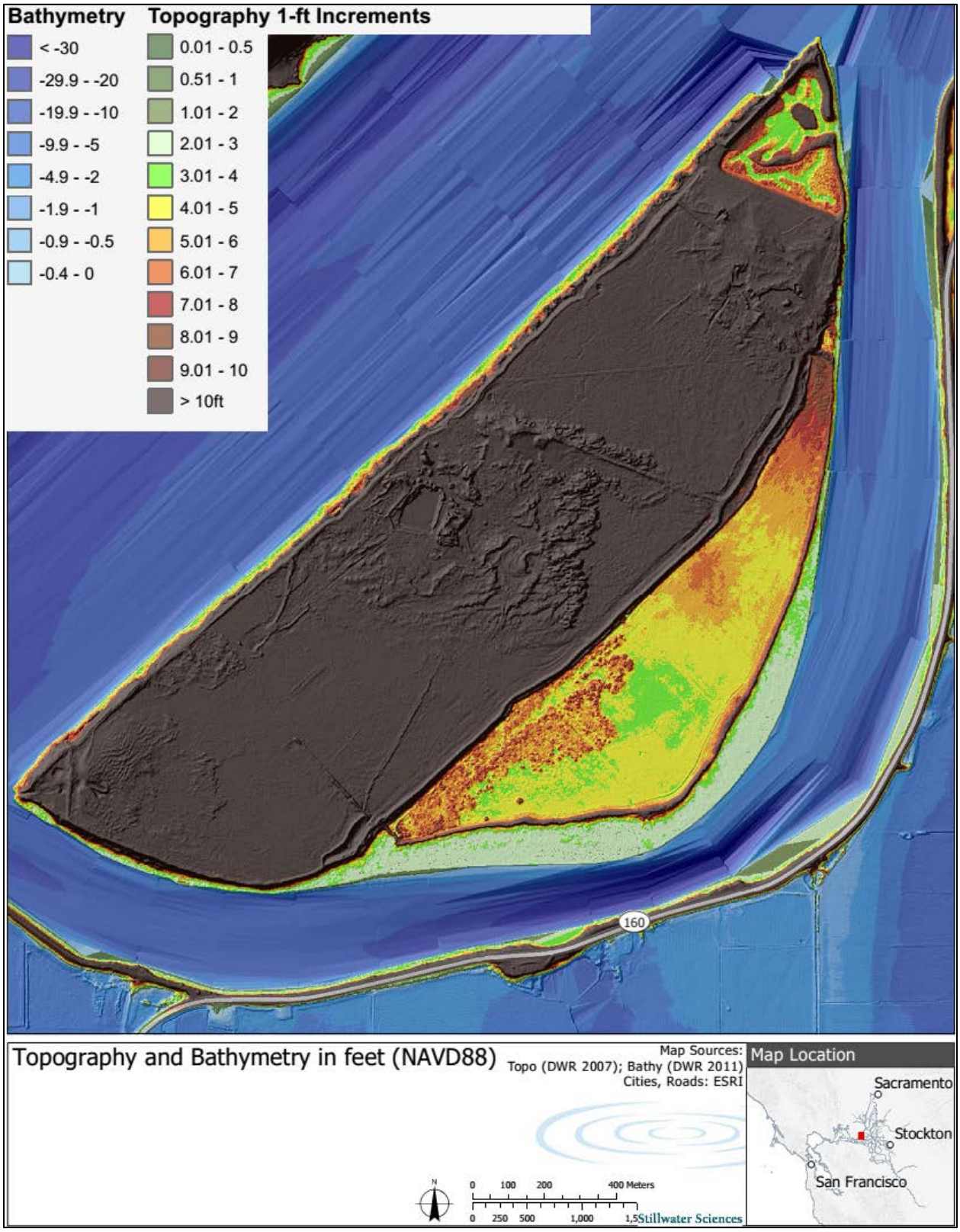

Figure 14. Bathymetry and topography for Decker Island.

Discussion

a) Violate any water quality standards or waste discharge requirements?
Less than significant with mitigation incorporated

Turbidity
The widening of the current levee breach, lowering of the northern levee, reshaping of the interior berms, and the construction of access routes to reach them, could cause elevated turbidity levels inside of Decker Island and in Horseshoe Bend. Two temporary culverted crossings would be constructed in the agricultural ditch within Decker Island to be utilized by construction equipment to reshape interior berms into upland refugia habitat. The current levee breach (15 to 20 feet) would be widened (130 feet at the top) to increase tidal access to the island. While a silt curtain, or a similar turbidity control method, would be used at the breach location as necessary to control suspended sediment leaving the island, there would still be potential to temporarily increase turbidity within Horseshoe Bend and Decker Island. With mitigation measure WQ-1 incorporated, impacts would be less than significant.

> **Mitigation Measure WQ-1: Minimize Construction Related Turbidity**
> To minimize turbidity impacts to water quality, the following BMPs shall be implemented for all phases of the Project:
>
> - A silt curtain or similar turbidity control method shall be utilized outside of the southern breach prior to the start of in-water construction if necessary.
> - Silt fences, fiber rolls, or other similar sediment control materials shall be utilized on all exposed soils that may run into water.
> - In-water work shall occur during low tide or incoming, where feasible, and excavate towards the island interior from machinery operated from an upland location.
> - Except for designated access routes, staging areas, and construction footprint, vegetation shall be left in place and unharmed.
> - Upon completion of construction, exposed areas would be seeded with native vegetation.

Methylmercury
Like other restored wetlands, the Decker Island Restoration Project has potential to increase availability of methylmercury in the aquatic food web; however, this is not expected as pre and post-restoration conditions would remain very similar. Figure 12 and 13 depict the pre-project acreage of high marsh habitat, which almost entirely exists off site. The restoration would increase the tidal regime and result in a reclassification of muted tidal wetland to fully tidal wetland, which may slightly increase the amount of high marsh habitat on site (Figure 2 and Table 2). High marsh habitat, which floods less frequently and regularly dries, is generally shown to have higher concentrations of methylmercury, while tidal habitat that does not fully dry tends to have lower concentrations of methylmercury (Hall et al. 2008). While the amount of

methylmercury produced on site is not expected to change, it is possible that the increased tidal regime could export methylmercury off site into the open water of Horseshoe Bend. Again, while this is a possibility, it is not likely to change significantly from what is being exported now. As both methylmercury production and export are not likely to change as a result of the Project, impacts would be less than significant.

Salinity

Salinity data for Decker Island was obtained upstream at the DWR Data Water Library Station B91160 located at the terminus of Three Mile Slough with the Sacramento River. Daily-averaged conductivity ranged from 250 uS/cm in the spring to 3,400 uS/cm in summer months (Figure 15). The average salinity seems to be mostly below 2 practical salinity units (PSU); however, at high tides, especially during summer, maximum daily averaged salinity was measured as high as 3 PSU.

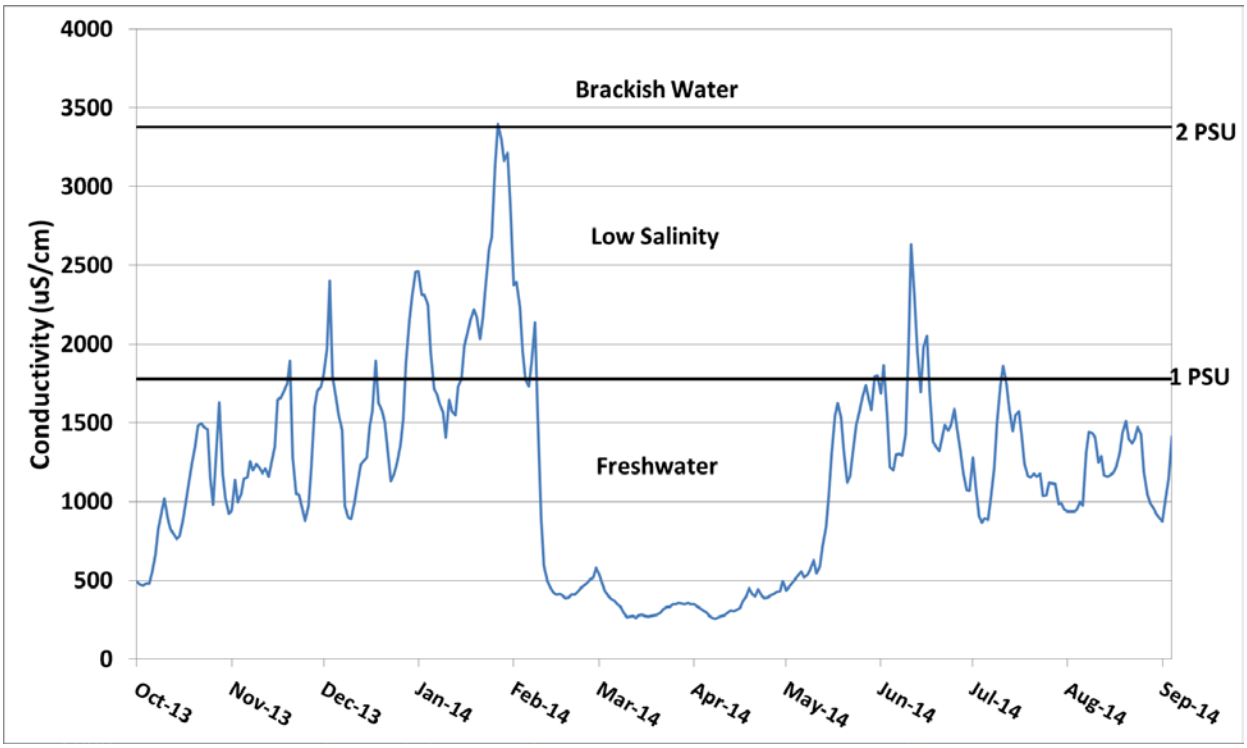

Figure 15. Daily-averaged conductivity measurements for the 2014 water year near Decker Island. Data was obtained from CDEC station EMM (Emmaton) located in Horseshoe Bend near the Decker Island culvert. The two horizontal lines indicate a rough estimate of practical salinity units (PSU) based on averaged water temperature.

Upon completion of construction and widening of the southern breach, the interior of Decker Island would be fully connected to the tidal influence of Horseshoe Bend. This would result in a change in the tidal prism resulting in increased peak volumes from mean high water (5.8 feet NAVD88) under muted conditions to mean higher high water (6.3 feet NAVD88). This increase in the peak volumes will lead to an additional 20 acres of high marsh habitat. The small increase

in inundation of the high marsh plain would not change the site function nor is it expected to impact the daily-averaged salinity at the local monitoring station.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

No impact

The Project does not include groundwater pumping nor would it interfere with groundwater recharge; therefore, no impact would occur.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?

Less than significant

The Project would slightly alter the drainage pattern by increasing tidal connectivity to the Project area, widening the southern breach, and lowering a section of the northern levee. Hydrologic modeling shows that some of the tidal flows would exit the Project site at the newly lowered northern levee (Appendix F); water currently exits through the southern breach. The modeling also shows that velocities would not be large enough to influence scour, nor is it expected that erosion on or offsite would be affected; therefore, impacts would be less than significant.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?

No impact

The Project would not alter the drainage pattern of the site or area in a way that would increase the rate of surface runoff or substantially alter the course of the Sacramento River; therefore, there would be no impact.

e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less than significant

The Project would not contribute runoff water that would exceed a stormwater drainage system capacity. Construction would occur during the dry season (August – October), and the staging area would be located in an upland area that does not drain to aquatic habitats. Exposed levees or construction access areas could impact water quality by increasing sediment runoff during precipitation events; however, this would not be a likely event and restrictions associated with the SWPPP would be in place during all phases of construction. There would not be a significant source of polluted runoff; therefore, impacts would be less than significant.

f) Otherwise substantially degrade water quality?

Less than significant

As discussed in a), c), and e) above, the Project is not expected to cause significant impacts to discharge standards, erosion, siltation, or other pollutants. There may be short-term temporary turbidity impacts from construction, but these would be relatively small scale and mitigated by construction standards (Mitigation Measure WQ-1) and a SWPPP. The Project would not substantially degrade water quality; therefore, impacts would be less than significant.

g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate map or other flood hazard delineation map?

No impact

The Project would not construct any houses; therefore, there would be no impact.

h) Place within a 100-year flood hazard area structures that would impede or redirect floodflows?

No impact

The Project would not construct any structures; therefore, there would be no impact.

i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

No impact

The Project would not expose people or structures to significant loss, injury, or death as a result of flooding; therefore, there would be no impact.

j) Contribute to inundation by seiche, tsunami, or mudflow?

No impact

The Project would not affect the risk for seiche, tsunami, or mudflows; therefore, there would be no impact.

3.10 Land Use and Planning

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an establish community?				x
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (Including but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				x
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				x

3.10.1 Environmental Setting

The Project is located on the eastern side of Decker Island in Solano County. The surrounding land uses include mining of aggregate and cattle grazing. The Project area is zoned as miscellaneous/ open space in the Solano County General Plan (2008); however, the Project area is currently a muted tidal wetland with upland habitat.

Delta Plan

The Delta Plan is a comprehensive, long-term management plan for the Delta. Required by the 2009 Delta Reform Act, it creates new rules and recommendations to further the state's co-equal goals for the Delta: Improve statewide water supply reliability, and protect and restore a vibrant and healthy Delta ecosystem, all in a manner that preserves, protects and enhances the unique agricultural, cultural, and recreational characteristics of the Delta. Specifically, the following policies and recommendations are applicable to the project:

- GP1: Mitigation Measures, Best Available Science, and Adaptive Management Plan
- ER P2: Restore habitat at appropriate elevations.
- ER P5: Avoid introductions of and habitat improvements for invasive nonnative species.
- ER R2: Prioritize and implement projects that restore Delta habitat.
- DP P2: Avoid conflicts with adjacent land uses

The Delta Land Use and Resource Management Plan (1995) established policies for the Delta in order to protect and enhance the existing land use in the Primary Zone for local agencies. This plan and the subsequent policies do not apply to State agencies.

Delta Protection Commission
The Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta is a long term management plan to protect, maintain, enhance, and restore, where possible, the overall quality of the Delta environment. This includes agriculture, wildlife habitat, and recreation, and attempts to balance conservation and development within the Delta. The Management Plan outlines goals for land use, agriculture, natural resources, recreation and access, water, levees, and utilities and infrastructure.

3.10.2 Discussion

a) Physically divide an established community?
No Impact.
The Project would not physically divide an established community because there is no community on Decker Island; therefore, there would be no impact.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?
No Impact.
The Project would not conflict with the Delta Plan or the Delta Protection Commission's long term management plan. The Project site is at an appropriate elevation for restoration, would exclude habitat conducive to invasive nonnative species, and would be located within the prioritized area of the Delta.

The project area is zoned miscellaneous/open space although the existing conditions are muted tidal wetlands. The Project would not change existing land uses on the site or conflict with land use plans; therefore, there would be no impact.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?
No impact.
There is an HCP within Solano County (Solano Multispecies Habitat Conservation Plan), but the Project would not conflict with the HCP; therefore, there would be no impact.

3.11. Mineral Resources

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				x
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				x

3.11.1 Environmental Setting

Mineral resources in the project area are minimal. According to the DOC's California Geological Survey (CGS) the Project area does not have land classified with any mineral resource of significance. Oil and gas data are maintained by the USGS and DOC's Division of Oil, Gas, and Geothermal Resources. There are seven gas wells near the Project area but not on Decker Island. All seven wells are inactive (Appendix X – Mineral Remoteness Evaluation).

A Mineral Remoteness Evaluation performed by DWR in August 2015 concluded that "the likelihood of economic mineral resources removal at the time of this assessment is so remote as to be negligible" (Appendix H). While the likelihood is negligible, the mineral rights for the Project area are not owned by DWR. A 1 acre area in the staging area would be designated following Project completion to be utilized by the mineral rights holder.

3.11.2 Discussion

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No impact

The Project area does not have land classified with any minerals of significance, nor is it identified as an area with aggregate and mineral resources; therefore, there would be no impact.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No impact

The Project area is not delineated as significant for mineral resources by any federal, state, or local plans and no mineral resources are known to occur in the area.

3.12 Noise

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

Environmental Setting

Existing sources of noise near the Project site include DI Aggregate, Inc. operations on the Western portion of Decker Island, Highway 160 to the east across Horseshoe Bend, farming

equipment to the east operated on Sherman Island, and boat traffic in Horseshoe Bend and the SRDWSC.

Noise sensitive receptors typically include occupants of residences, schools, religious facilities, hospitals, rest homes, and parks. Though the Project area is in Solano County, the closest sensitive receptors are agricultural residences roughly a quarter mile to the east. These residences are situated below the Highway 160 levee.

Discussion

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

No impact

The Project would not expose people to, or generate noise levels in excess of, current noise levels. The closest sensitive receptors are agricultural residences roughly a quarter mile east of the Project area. Construction would take place during daylight hours, behind levees and riparian vegetation, and with relatively small construction equipment that are no larger than standard farming equipment; therefore, there would be no impact.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

No impact

The project would not use equipment that would cause ground borne vibrations or ground noise; therefore, there would be no impact.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

No impact

The Project would increase tidal water access onto Decker Island. The noise generated as a result would be no different than existing levels; therefore, there would be no impact.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

No impact

A temporary increase in ambient noise levels would occur during the construction phase; however, this noise level would be no different than noise levels from agricultural and mining practices on Sherman Island and Decker Island. As the temporary increase in ambient noise would not be substantial, there would be no impact.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No impact

The Project is not located within an airport land use plan or within two miles of a public airport; therefore, no impact would occur.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No impact

The Project is not located in the vicinity of a private airstrip; therefore, there would be no impact.

3.13 Populations and Housing

Environmental Factors and Focused Questions for determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				x
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				x
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				x

3.13.1 Environmental Setting

The Project area is on an island without vehicular access and is bordered by an aggregate mining operation. No residential units are on the island and the island is zoned as miscellaneous/open space in the Solano County General Plan.

3.13.2 Discussion

a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?

No impact

The Project would not involve the creation of new homes or businesses or the extension or creation of new infrastructure; therefore, there would be no impact.

b) Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?

No impact

The Project would not involve the displacement of housing units; therefore, there would be no impact.

c) Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?

No impact

The Project would not displace any people; therefore, there would be no impact.

3.14 Public Services

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				x
Fire protection?				x
Police protection?				x
Schools?				x
Parks?				x
Other public facilities?				x

3.14.1 Environmental Setting
The Project area is serviced by CAL FIRE and Solano County Sheriff's Department.

3.14.2 Discussion
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?
No impact
The Project would increase the amount of tidal wetlands on Decker Island by 22 acres, which would reduce local fire risk. The Project site would continue to be serviced by CAL FIRE and there would be no new fire protection needed; therefore, there would be no impact.

Police protection?
No impact

The Project site would continue to be serviced by the Solano County Sheriff's Department and there would be no new protection needed; therefore, there would be no impact.

Schools?
No impact
The Project would not provide new housing; therefore, there would be no impact.

Parks?
No impact
The Project would not affect park services; therefore, there would be no impact.

Other public facilities?
No impact
There are no other public facilities affected by the Project; therefore, there would be no impact.

3.15 Recreation

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				x
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				x

3.15.1 Environmental Setting

The Project area is closed to the public and does not include recreation facilities. The Project may remain closed following restoration for mitigation and monitoring purpose, but the Project site may be opened up to recreation in the future. Boating and fishing does occur immediately outside the Project area in Horseshoe Bend and at the CDFW Decker Island enhancement site; however, construction activities, including mobilization and demobilization, would not interfere with boating traffic or fishermen.

3.15.2 Discussion

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No impact

The Project would not result in increases to housing or population. Visitors to Decker Island would likely use the boat launch at Brannon Island State Recreation Area; however, it is not expected that recreational visits would be planned specifically to Decker Island and that visits would simply be extensions of normal Delta outings.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

No impact

The Project does not include recreational facilities; therefore, there would be no impact.

3.16 Transportation/Traffic

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exceed the capacity of the existing circulation system, based on applicable measures of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			x	
b) Conflict with an applicable congestion management program, including but not limited to, level of service standards and travel demand measures and other standards established by the county congestion management agency for designated roads or highways?				x
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				x
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				x
e) Result in inadequate emergency access?				x
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				x

3.16.1 Environmental Setting

There is no direct public vehicle access to Decker Island and there are no public roads on the island. The only access to the island is via boat with few available landing locations. A limited number of equipment will be brought onto the island by barge for construction activities. The barge is 10 feet wide and 41 feet long and would unload at a landing beach located at the northern end of Decker Island along Horseshoe Bend. Complete mobilization would take

several trips but is not expected to take longer than 1 day to complete. The barge when landed would not interfere with boating traffic or fishermen.

No fill material will be exported or imported. A small crew of construction workers and other Project personnel would likely access the Project site from Brannan Island State Recreational Area or Sherman Island via Highway 12 and Highway 160; however, mobilization from Antioch or Rio Vista are also possibilities depending on the direction of travel.

3.16.2 Discussion

a) Exceed the capacity of the existing circulation system, based on applicable measures of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less than significant

The island is isolated from surrounding roadways and there is no direct vehicular access to the island. There are also no public roads on the island. A limited number of equipment would be brought to the island by barge during the construction phase. The barge would temporarily occupy a landing beach in Horseshoe bend at the northern end of Decker Island. This impact would be less-than-significant.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

No impact

Mobilization would not be expected to be impactful as construction crews would be small and equipment and supplies would be left on the Project site; therefore, there would be no impact.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?

No impact

The Project would not affect air traffic patterns; therefore, there would be no impact.

d) Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No impact

The Project would not alter existing public roads; therefore, there would be no impact.

e) Result in inadequate emergency access?

No impact

The Project would not result in any road closures; therefore, there would be no impact.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact

Public transit, bicycle, or pedestrian facilities do not exist within the immediate vicinity of the Project; therefore, there would be no impact.

3.17 Utilities & Service Systems

Environmental Factors and Focused Questions for Determine of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				x
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				x
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				x
d) Have sufficient water supplies available to serve from existing entitlements and resources, or would new or expanded entitlements be needed?				x
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				x
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				x
g) Comply with federal, state, and local statutes and regulation related to solid waste?				x

3.17.1 Environmental Setting

The Project would not generate wastewater or require the use of a wastewater treatment facility.

3.17.2 Discussion

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

No impact

No wastewater would be generated by the Project; therefore, there would be no impact.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No impact

The Project would not impact any current wastewater treatment facilities; therefore, there would be no impact.

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No impact

No new drainage facilities would be installed for the Project; therefore, there would be no impact.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?

No impact

The Project would not affect existing water entitlements; therefore, there would be no impact.

e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No impact

The Project would not require consultation with a waste water treatment provider; therefore, there would be no impact.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

No impact

The Project would not be expected to generate solid waste; therefore, there would be no impact.

h) Comply with federal, state, and local statutes and regulations related to solid waste?

No impact

The Project would not be expected to generate solid waste; therefore, there would be no impact.

3.18 Mandatory Findings of Significance

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

3.18.2 Discussion

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or eliminate important examples of the major periods of California history or prehistory?

Less than significant with mitigation

Potentially significant effects to biological resources, hazards and hazardous materials, and hydrology and water quality are identified in the preceding sections of this Initial Study. As detailed in this document, those impacts would be *less than significant with mitigation*. Impacts to biological resources would mostly be temporary construction related impacts that would be avoided through construction work windows, biological surveys, and construction BMPs. There would be onsite mitigation for small scale impacts to riparian habitat (See Mitigation Measure Bio-11), but ultimately the Project would be beneficial to biological resources. There are no known sources of hazardous materials on Decker Island; the potential impacts from the

Proposed Project are all short-term construction related impacts from equipment usage and staging areas.

b) Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" meant that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of the other current projects and effects of probable future projects)?

Less than significant

As stated above, most impacts would not result in cumulatively significant impacts as they are temporary construction related impacts. However, as Decker Island exists within the greater San Francisco Bay-Delta Estuary, *less than significant* impacts to hydrology or water quality have potential to impact the entire estuary and affect past, present, and future projects. Complex issues like saltwater intrusion, when examined over an estuary-wide restoration initiative, could be cumulatively considerable as restoration acreage increases. However, as Decker Island is a small scale project, it is not expected to have cumulatively considerable impacts, even when considering greater restoration efforts.

The mean peak tidal prism on Decker Island would change from mean high water mark of 5.8 feet NAVD88, under muted conditions, to 6.3 feet NAVD88 upon restoration; the high elevation wetland area is expected to expand by 22 acres as a result. Currently there are approximately 105,000 acres of aquatic habitat (SFEI 2014) within the legal Delta; this includes open water aquatic, managed wetlands, seasonal wetlands, and freshwater marsh. When considering the greater FRP goal of 8,000 acres, Decker Island accounts for only a 0.25% of an increase in aquatic habitat that could influence water quality issues like saltwater intrusion. If there were any changes to salinity as a result of the Project, these effects would likely be localized around the Decker Island breach location and would quickly diminish away from the breach. Thus, when considering past, present, and future restoration projects, the Proposed Project would not have a cumulatively considerable effect on hydrology and water quality.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than significant

The Proposed Project would not result in health risks or substantial emissions of air pollutants. It would have no effects to utilities or services. Noise impacts would be short-term and there are no nearby sensitive receptors. The Project would not substantially adversely affect recreational opportunities in the Delta. There would be less than significant impacts, both directly and indirectly, on environmental factors that could cause substantive adverse effects on human beings.

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