PUBLIC DRAFT ◦ JANUARY 2020

Initial Study/Mitigated Negative Declaration
Grand Island Levee Erosion Repair Project

PREPARED FOR

Reclamation District No. 3
P.O. BOX 1011
Walnut Grove, CA 95690

PREPARED BY

Stillwater Sciences
2855 Telegraph Avenue, Suite 400
Berkeley, CA 94705

and

MBK Engineers
455 University Avenue, Suite 100
Sacramento, CA 95825

Stillwater Sciences

Suggested citation:
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Cover photo: Grand Island's Project levee, waterside.

PROJECT SUMMARY

Grand Island Levee Erosion Repair Project	
CEQA lead agency name and address	Reclamation District No. 3 P.O. BOX 1011 Walnut Grove, CA 95690
CEQA responsible agencies	• California Department of Water Resources • Central Valley Regional Water Quality Control Board • California Department of Fish and Wildlife
Contact person and phone number	Mike Kynett Project Engineer, or Tina Anderson Project Manager MBK Engineers 455 University Avenue, Suite 100 Sacramento, CA 95825 Office: (916) 456-4400 Fax: (916) 456-0253
Project location	Grand Island, Sacramento-San Joaquin Delta, Sacramento County
Project sponsor's name and address	Reclamation District No. 3 P.O. BOX 1011 Walnut Grove, CA 95690 (916) 776-1945
Zoning	Recreation
Description of Project	Repair approximately 1,700 ft of Grand Island's levee system while restoring riparian habitat by establishing a waterside berm planted with native species.
Surrounding land uses and setting	The Project is adjacent to Steamboat Slough to the north, a dredged spoils/fill area to the south, and farmed lands to the east
Other public agencies whose approval may be required (e.g., permits, financing, or participation agreement)	• California Department of Water Resources, funding under the Flood System Repair Project • U.S. Army Corps of Engineers (Clean Water Act Section 404 Permit) • Central Valley Regional Water Quality Control Board (Clean Water Act Section 401 water quality certification) • California Department of Fish and Wildlife (Lake and Streambed Alteration Agreement) • U.S. Fish and Wildlife Service and National Marine Fisheries Service (Endangered Species Act Section 7 consultation regarding federally protected species) • Central Valley Flood Protection Board (maintenance notification)

PROPOSED MITIGATED NEGATIVE DECLARATION

Project: Grand Island Levee Erosion Repair Project

Lead Agency: Reclamation District No. 3

Project Location: Grand Island is located in the Sacramento-San Joaquin Delta, between the cities of Walnut Grove, Rio Vista, and Courtland in Sacramento County, California. The Project is located at the southwest portion of Grand Island along the left river bank of Steamboat Slough between stations 562+00 and 579+00 (Levee Mile 10.78 and 11.02)

Project Description: Reclamation District No. 3 plans to repair approximately 1,700 feet of levee to address critical erosion, bank loss, and waterside instability by placing rock, while restoring riparian habitat by establishing a waterside berm planted with native species. The Project will include placing rock on the waterside levee slope and reconstructing a section of the bank with a soil planting berm and rock containment berm. The Project will reestablish the authorized waterside levee slope geometry by replacing the bank and associated function that was part of the original federal levee.

Findings: An Initial Study has been prepared to assess the Project's potential effects on the environment and the significance of those effects. Based on the Initial Study, Reclamation District No. 3 has determined that the Project will not have any significant impacts on the environment once mitigation measures included in the Project design are implemented. This conclusion is supported by the following findings:

- The Project will result in no impacts on: agricultural and forest resources, cultural resources, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities/service systems.
- The Project will result in less-than-significant impacts on: aesthetics, air quality, energy, geology and soils, and greenhouse gas emissions.
- Mitigation is included in the Project design to reduce potentially significant impacts to less-than-significant levels for: biological resources, hazards/hazardous materials, and hydrology/water quality.

Mandatory Findings of Significance:

- The Project will not substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.
- The Project will not have cumulatively considerable environmental effects.
- The Project will not have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly.
- The Project will not achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- No substantial evidence exists that the Project will have a negative or adverse effect on the environment.

Proposed Mitigation Measures: Mitigation measures included in the Project to avoid or minimize potential environmental impacts are included in the attached Initial Study, which is hereby incorporated and fully made part of this Mitigated Negative Declaration. Implementation of these mitigation measures will reduce the potential environmental impacts of the Project to a less-than-significant level. Reclamation District No. 3 has agreed to implement each of the identified mitigation measures, which will be adopted as part of the Mitigation Monitoring and Reporting Program.

Determination
In accordance with Section 21082.1 of the California Environmental Quality Act (CEQA), Reclamation District No. 3 has independently reviewed and analyzed the Initial Study and proposed Mitigated Negative Declaration for the Project and finds that the Initial Study and proposed Mitigated Negative Declaration reflects the independent judgment of Reclamation District No. 3. The lead agency further finds that the Project mitigation measures will be implemented as stated in the Initial Study and Mitigated Negative Declaration. This Mitigated Negative Declaration is filed in accordance with CEQA and state CEQA guidelines.

I hereby approve this Project:

_____ _____

Reclamation District No. 3 Date

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1 INTRODUCTION

Reclamation District No. 3 (District) plans to repair approximately 1,700 feet (ft) of levee on the southwest corner of Grand Island along the left river bank of Steamboat Slough, to address erosion, bank loss, and waterside instability (Project). The Project will include placing rock while restoring riparian habitat by establishing of a waterside berm planted with native species. This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared in compliance with the California Environmental Quality Act (CEQA) to address the potential environmental effects of the Project. With the implementation of conservation measures included in the Project description, any potential impacts associated with this Project are anticipated to be less than significant.

1.1 Project Location

Grand Island is a 16,245-acre island located in the Sacramento-San Joaquin River Delta (Delta), between the cities of Walnut Grove, Rio Vista, and Courtland in Sacramento County, California (Figure 1-1). The island is bordered by Steamboat Slough to the west and the Sacramento River to the northeast, east, and south. Surrounding islands include Ryer Island to the west, Brannan Island to the south and east, and Sutter Island to the northwest. This area is within the Rio Vista, Isleton, and Courtland U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles. Two state highways traverse the island. Highway 160 is along the Sacramento River levee from the Steamboat Slough Bridge at the north to the Isleton Bridge at the south. Highway 220 crosses the island from Ryde on the Sacramento River to the ferry crossing on Steamboat Slough. The island is accessible from the north via Steamboat Slough Bridge on State Highway 160, from the east via Walnut Grove Bridge on Walnut Grove Road, from the south via Isleton Bridge on State Highway160, and from the west via State Route 220 and Caltrans ferry service ("J-Mack Ferry") across Steamboat Slough. Grand Island Road (a Sacramento County road) spans the western levee of Grand Island and provides access to the Project Area.

1.2 Project Area

The Project Area is at the southwest portion of Grand Island and includes approximately 1,700 ft of levee along the south bank of Steamboat Slough between stations 562+00 and 579+00 (Levee Mile 10.78–11.02) (Figure 1-2). The Project Area (where construction will occur) is primarily along the waterside of the levee. The area adjacent to the levee is uninhabited dredge spoil land (from the Deep Water Shipping Channel project) and landfill. This area is within Hydrologic Unit Code (HUC) 180201630702 (USGS & USDA-NRCS 2013).

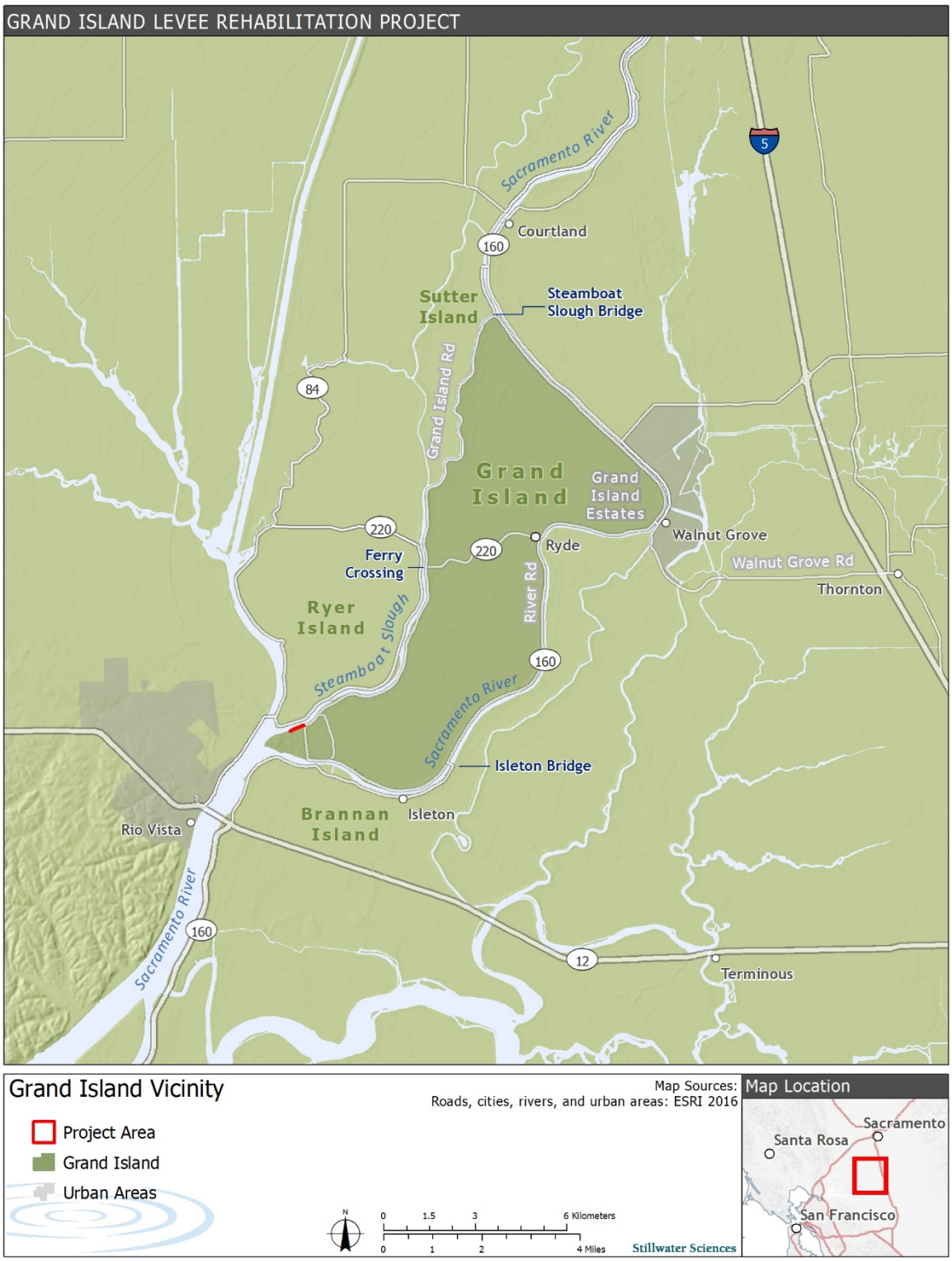

Figure 1-1. Grand Island Levee Erosion Repair Project Area and surrounding vicinity.

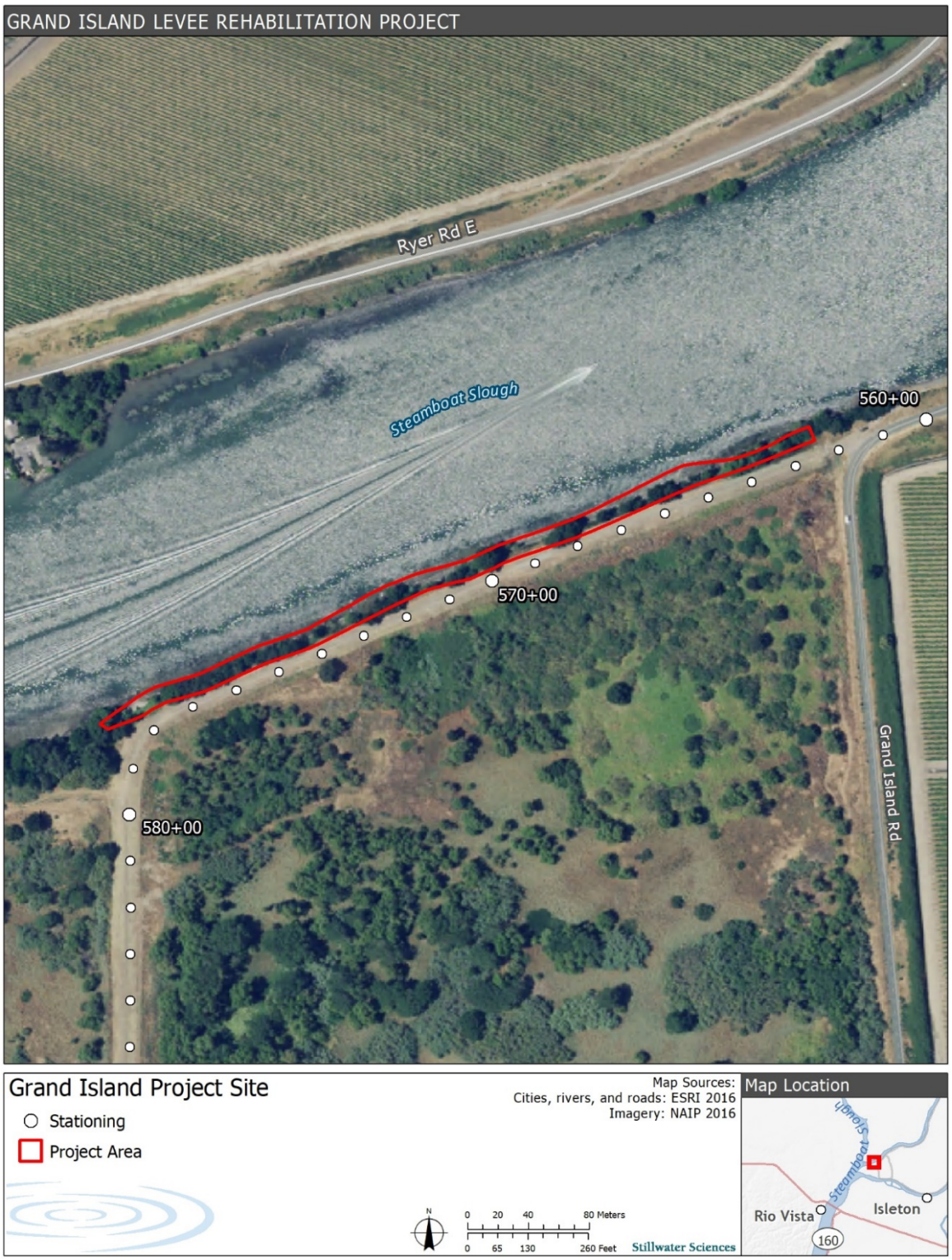

Figure 1-2. Grand Island Levee Erosion Repair Project Area.

1.3 Project Description

1.3.1 Project purpose

The Project is levee bank protection designed to reduce the risk of levee failure on the southwest corner of Grand Island by addressing current erosion, bank loss, and waterside instability along the south bank of Steamboat Slough. The Project will include placing rock while restoring riparian habitat by establishing a waterside berm planted with native species. This Project is funded by DWR under the Flood System Repair Project, part of the California Disaster Preparedness and Flood Prevention Bond Act of 2006 (Project Funding Agreement 2016-FSRP-RD3-01).

1.3.2 Project design

Project components include flattening the waterside levee slope, placing rock on the waterside levee slope, and reconstructing a section of the bank with a soil planting berm and rock containment berm (Figures 1-3 and 1-4). Rock slope protection will be placed along the waterside levee slope up to the 1957 water surface plus 3 ft elevation to create a slope no steeper than 1.5 horizontal:1 vertical (Figure 1-4). The slope of the planting berm will be 20 horizontal:1 vertical.

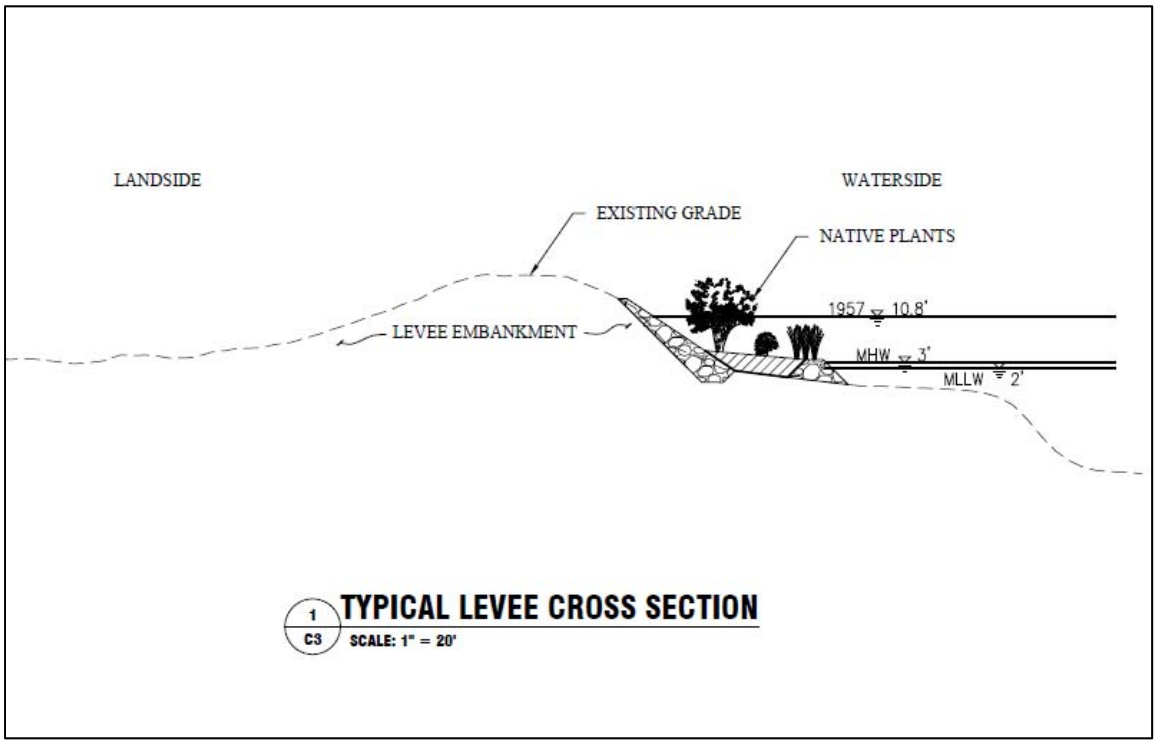

Figure 1-3. Typical levee cross-section for the Grand Island Levee Erosion Repair Project.

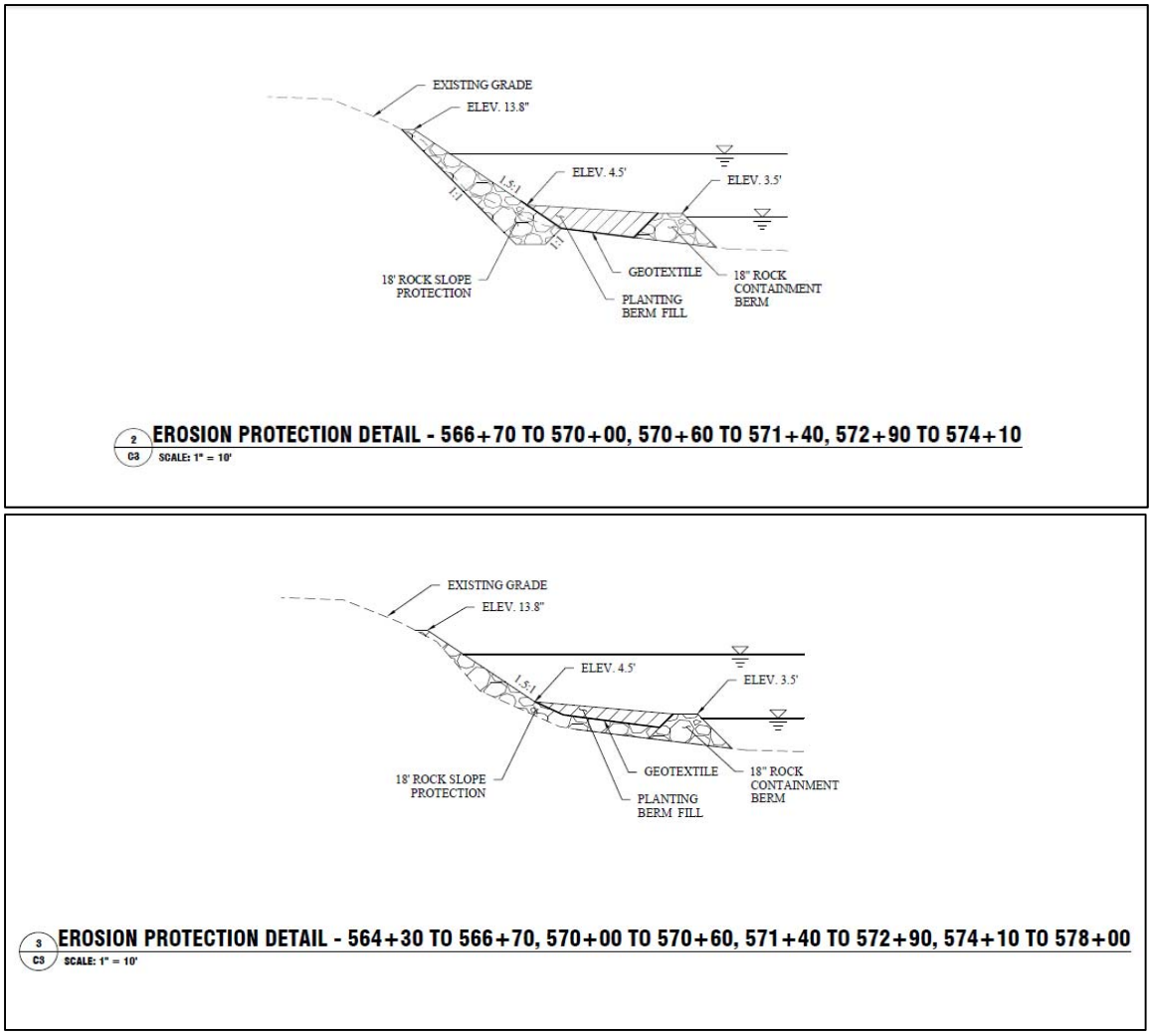

Figure 1-4. Erosion protection detail for the Grand Island Levee Erosion Repair Project.

1.3.3 Site preparation

Site preparation activities include clearing ruderal plants (e.g., blackberries), debris, and grading to remove major voids or variability in the levee slope. Approximately six large trees will need to be removed for safety reasons (Figure 1-5). Other trees may need to be limbed, and smaller trees cleared to facilitate equipment access. Ground cover will be cleared prior to placing rock. Remnant defunct through-levee pipes (tide gates) associated with the Deep Water Shipping Channel project may need to be either removed or abandoned in place. Some excavation may be required to prepare the levee for the rock slope protection.

Figure 1-5. Plan view of the Grand Island Levee Erosion Repair Project design (red x's represent trees that will be removed).

1.3.4 Imported fill

Approximately 14,000 tons of rock fill material (18-inch or smaller) will be placed on the levee slope and used for the rock containment berm. Rock will be placed on the waterside levee slope from an estimated depth of 2.5 ft below mean lower low water (MLLW) to 3 to 6 ft below the levee crest. The rock containment berm will be placed during low tide to reduce in-water work; the rock berm will be installed and then will catch sediment, acting as a sediment barrier and reducing turbidity. Once the rock containment berm is in place, the planting berm will be placed. Approximately 3,500 tons of soil will be imported and used to construct the planting berm. Fill materials will be imported from a nearby off-site location. To restore the levee crest access road, approximately 750 tons of aggregate base material will be placed. Imported materials will likely be sourced from Lodi or Stockton (an approximately 50-mile round trip). Each truck trip will transport an estimated 30 tons of material.

1.3.5 Planting

Planting and containment berms will be established approximately 0.5 ft above mean high water and extend 20 ft into the channel from the waterside levee toe; the base of the containment berms will be 3 to 5 ft below MLLW. New vegetation including 181 trees (spaced 8 feet on-center), 483 tules (spaced 3 feet on-center), and 290 shrubs (spaced 5 feet on-center) will be established on the planting berm (Figures 1-3 and 1-4). Rock will be placed around existing trees greater than 2 inches in diameter; no new woody vegetation will be planted on the levee slope in the levee's vegetation-free zone (USACE 2014). Disturbed areas will be revegetated with native grasses. Hydroseeding and planting will occur in October or November, prior to the rainy season, and no irrigation will be required.

1.3.6 Erosion control

The rock containment berm will be placed prior to the soil in order to control sediment movement into aquatic habitat. The contractor will monitor for sediment plumes and deploy silt curtains if any plumes are observed. The levee crown roadway will be graded inward toward the island at a cross slope of approximately 2%; therefore, runoff will flow toward the landside. Erosion control measures will be implemented in accordance with the Caltrans Construction Site Best Management Practices (BMP) Manual (Caltrans 2017).

1.3.7 Equipment and staging

Table 1-1 provides a list of equipment that is anticipated to be used for the Project.

Table 1-1. Equipment planned for the Grand Island Levee Erosion Repair Project.

Equipment type	Number of rigs (or loads, if specified)
Excavators	1
Dozer	1
Haul trucks	~30 trips per day[a]
Water trucks	1
Front-end loaders	1
Barge	3
Crane Barge	1

[a] Number of haul truck trips per day may vary but will total approximately 600 truck trips.

Placement of the rock slope protection, planting berm, and containment berm will likely be performed by excavator from the levee crest, or from a crane barge in Steamboat Slough. Stockpiling of construction materials, including portable equipment, vehicles and supplies, and chemicals will be restricted to the levee crest where there is an existing graveled road.

Construction equipment and materials (e.g., rock revetment, aggregate base rock, any required planting materials, fill) will be transported to Grand Island via haul truck or barge. Haul routes will be restricted to existing levee roads, county roads, and state highways; no new roads will be created. Figure 1-6 shows the local haul route adjacent to the Project Area.

Figure 1-6. Haul road location near Project Area.

1.3.8 Construction schedule and timing

Project construction is planned to occur in 2020 or 2021, in one phase over the course of three or four weeks between May 1 and November 30; in-water work would be limited to August 1 through October 31. A typical workday is assumed to begin at 6:00 am and end at 6:00 pm, five days per week, but potentially also on Saturdays. Construction work will not occur prior to 6:00 am or after 6:00 pm. No nighttime construction lighting will be needed. An estimated 15 to 20 working days will be necessary to complete the Project. There will typically be four workers per day on site (not including haul truck drivers), including a Superintendent/grade setter and three equipment operators.

1.4 Conservation Measures

The following conservation measures will be implemented as part of the Project to help assure that the Project will have no impact or only less than significant impacts on the environment, including biological resources (described in Section 2.4), hazards/hazardous materials (described in Section 2.9), and hydrology/water quality (described in Section 2.10). These measures comply with existing regulations and/or requirements or standard practices to avoid, minimize, reduce, or compensate for potential impacts on environmental resources. Pre-construction surveys will be conducted for each year of Project implementation, if applicable. Results from all pre-construction surveys described in the following conservation measures will be provided to Delta Levee Program California Department of Fish and Wildlife (CDFW) staff for review prior to the initiation of construction.

- **BIO-1.** All contractors and equipment operators will be provided Worker Environmental Awareness Program training to educate them on the environmental resources of the Project Area, including special-status plants, fish, and wildlife species with potential to occur in the Project Area, the blue elderberry plants adjacent to the Project Area, and required protection measures. Training will include information about the federal and California Endangered Species Acts (ESA and CESA, respectively), and the consequences of non-compliance with these acts. Workers will be informed about the presence, life history, and habitat requirements of all special-status species that may be affected in the Project Area. Training also will include information on state and federal laws protecting nesting birds and aquatic resources. This training will be conducted prior to construction for each year of Project implementation, if applicable, and will be provided to any new staff/contractors added during the Project.
- **BIO-2.** A qualified biologist with appropriate knowledge and experience in the biology, life history, and identification characteristics of fish, wildlife, and plants that are likely to be encountered during the proposed action activities shall be present at Project-appropriate intervals during construction activities that have the potential to adversely affect sensitive resources (e.g., during any in-water work, excavation, filling, or tree removal). This monitor shall also be given the authority to halt any work they deem may be a cause for concern that may endanger fish or wildlife species or resources.
- **BIO-3.** The following measures will ensure that adverse effects on special-status plants are avoided or minimized (these measures may be replaced by equally or more protective measures as required by CDFW):
    a) Prior to construction, areas with special-status plants within the Project Area will be flagged or otherwise marked (e.g., staked, fenced) for avoidance, including a 10-ft radius buffer. If work must be conducted within the 10-ft buffer area, CDFW recommends utilizing hand tools and hand placement of materials. A biological monitor will be present during construction in areas within a 10-ft buffer of special-status plants to ensure impacts are avoided.
    b) If avoidance of special-status plants is not possible, prior to construction seeds will be collected when mature (generally the beginning of plant senescence), and any plants that would otherwise be impacted by construction activities will be salvaged and transplanted. Mitigation ratios, location, and timing of transplants will be determined in consultation with CDFW. Monitoring the success of transplant establishment will be conducted for a period of at least three years, or as otherwise required by CDFW. Location of transplanted individuals will be recorded using a submeter accuracy global positioning system (GPS) to enable location of the special-status plant species during and after the monitoring period is complete.

- **BIO-4.** All in-water work shall be limited to August 1 through October 31, a timeframe set by CDFW, U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS) as a time when special-status fish are least likely to be present.
- **BIO-5**. A qualified biologist will perform water quality monitoring for turbidity in Steamboat Slough during installation of the containment berm and placement of planting fill. Silt curtains will be deployed if any plumes are observed. If turbidity levels exceed applicable water quality objectives, either containment berm installation or fill placement activities will be delayed until lower tide levels occur.
- **BIO-6.** Surveys for western pond turtles and any active pond turtle nests (during the nesting and emergence of hatchling season, April through November) will be conducted by a qualified biologist within seven days prior to onset of staging or construction activities. If a western pond turtle nest is found, a 100-foot no-disturbance buffer zone will be established around the nest using flagging, fencing, and/or signage as appropriate. No construction activities will occur within the buffer zone until a qualified biologist has determined that the nest is not in use. If an active western pond turtle nest is found, CDFW will be notified to determine the appropriate course of action. If a western pond turtle is observed at any time before or during construction, it will be left alone to move out of the area on its own or may be relocated by a qualified biologist to a suitable aquatic habitat outside of the Project Area; translocation of turtles can only be performed in consultation with CDFW, and by an individual possessing a valid scientific collecting permit.
- **BIO-7.** For Project activities conducted during the bird breeding season (February 1–August 15), a pre-construction nest survey will be conducted. Surveys will include ground nesting birds and raptors, as well as suitable trees, shrubs, buildings, etc., within 300 ft of the Project Area. If active nests (nests containing eggs or young) are identified, a no-disturbance buffer zone will be established around the nest using flagging, fencing, and/or signage as appropriate. No construction activities will occur within the buffer zone until a qualified biologist has determined that the young have fledged or that construction activities within the buffer zone are not disturbing the nesting birds. The width of the buffer zone will be determined by a qualified biologist in coordination with CDFW; recommended buffers are 500 ft for raptors and 100 ft for other birds.
- **BIO-8**. The following measures will be implemented between March 1 and August 15 to avoid and/or minimize effects on Swainson's hawk (*Buteo swainsoni*) and other protected raptors:
    a) In order to avoid take (FGC § 86) of protected raptors (FGC § 3503.5), a pre-construction raptor nest survey will be conducted within 0.25 mile of the Project site, and within 15 days prior to the beginning of construction activities by a CDFW-approved biologist in order to identify active nests in the Project vicinity. The results of the survey will be submitted to the District and CDFW.
    b) If active nests are found, a 0.25-mile initial temporary nest disturbance buffer will be established. If Project-related activities within the temporary nest disturbance buffer are determined to be necessary during the nesting season, then an on-site biologist/monitor experienced with raptor behavior will be retained by the Project proponent to monitor the nest, and will along with the Project proponent, consult with CDFW to determine the best course of action necessary to avoid nest abandonment or take of individuals.
    c) Work may be only allowed to proceed within the temporary nest disturbance buffer if raptors are not exhibiting agitated behavior such as defensive flights at intruders, getting up from a brooding position, or flying off the nest, and only with the agreement of CDFW. Based on the behavior observed, the buffer may be reduced if

the birds are tolerant of construction activities. The designated on-site biologist/monitor shall be on site daily while construction-related activities are taking place within the 0.25-mile buffer and shall have the authority to stop work if raptors are exhibiting agitated behavior.

- **BIO-9.** The following measures will be implemented to avoid and/or minimize effects on western red bat:
  a) Conduct removal of large riparian trees that provide suitable bat roosting habitat (such as trees with deep bark crevices, snags, or holes) during the period between August 15 and October 15 when bats are active (i.e., before winter torpor), but avoiding the western red bat maternity season (May–July, when non-volant [i.e., non-flying] young may be present).
  b) A qualified bat biologist will monitor the removal of large riparian trees that provide suitable bat roosting habitat following a two-step removal process:
     - On the first day a biologist will supervise the removal of limbs and branches without habitat features by using a chainsaw; habitat features include limbs with cavities, crevices, exfoliating bark, or deep bark fissures. This will discourage bats from returning to the roost the following day.
     - On the second day, a biologist will supervise the removal of the remainder of the tree
- **HAZ-1.** Following is a list of best management practices (BMPs) that will be used during construction of the Project to avoid and minimize potential effects from hazards and hazardous materials:
  a) No potentially hazardous materials will be stored in a location where there is potential to enter any waterways and/or contaminate aquatic resources.
  b) All construction materials with the potential to pollute runoff will be handled and delivered with care, and stored under cover and/or surrounded by berms when rain is forecast or during wet weather.
  c) An effort will be made to store only enough of a product necessary to complete the job.
  d) Materials, fuels, liquids and lubricants, and equipment supplies stored on site will be stored in a neat, orderly manner, in their appropriate containers, with the original manufacturer's label and, if possible, in an enclosure.
  e) Any hazardous materials will be stored, labeled, and used according to local, state, and federal regulations.
  f) If drums must be stored without overhead cover, they will be stored at a slight angle to reduce corrosion and ponding of rainwater on the lids.
  g) Substances will not be mixed with one another unless recommended by the manufacturer.
  h) Manufacturer's recommendations for proper use and disposal of a product will be followed.
  i) Whenever possible, all of a product will be used up before disposal of its container.
  j) If surplus product must be disposed of, the manufacturers or the local and state recommended methods for proper disposal will be followed.
- **HAZ-2.** The following are measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the Project:

a) Minor spills are those that can be controlled by on-site personnel. The following actions will occur upon discovery of a minor spill:
   - The spread of the spill will be contained.
   - If the spill occurs on impermeable surfaces, such as any temporary surfaces installed for pollution prevention during construction, it will be cleaned up using "dry" methods (i.e., absorbent materials, cat litter, and/or rags).
   - If the spill occurs in permeable substrate areas, it will be immediately contained by constructing an earthen dike. The contaminated soil will be dug up and properly disposed of.
   - If the spill occurs during rain, the impacted area will be covered to avoid runoff, and appropriate clean-up steps will be taken after precipitation has ceased.
   - All steps taken to report and contain the spill will be recorded.

b) On-site personnel should not attempt to control major spills until the appropriate and qualified emergency response staff has arrived at the site. Failure to report major spills can result in significant fines and penalties. The following actions will occur upon discovery of a major spill:
   - If a major spill occurs, the Governor's Office of Emergency Services Warning Center will be notified at (800) 852-7550 in addition to local authorities.
   - For spills of federal reportable quantities, the National Response Center will also be notified at (800) 424-8802. The federal reportable spill quantity for petroleum products is any oil spill that (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.
   - A written report will be sent to all notified authorities.

c) Diesel fuel, oil, gasoline, and lubricants are considered petroleum products. These materials will be handled carefully to minimize their exposure to storm water. The risks in using petroleum products will be reduced by following these steps:
   - Waste oil and other petroleum products will not be discharged into the ground or other water bodies.
   - Petroleum products will be stored in tightly sealed containers that are clearly labeled, in a covered area, within prefabricated spill containment devices, earthen berms, or similar secondary containment features.
   - On-site vehicles will be monitored for fluid leaks and receive regular preventative maintenance to reduce the chance of leakage (e.g., check for and fix fuel oil leaks in construction vehicles on a regular basis).
   - Bulk storage tanks having a capacity of more than 55 gallons will be provided with a secondary containment measure. Containment can be provided by a prefabricated temporary containment mat, a temporary earthen berm, or other measure.
   - Bulk fuel or lubricating oil dispensers will have a valve that must be held open to allow the flow of fuel into construction vehicles. During fueling operations, the contractor will have personnel present to detect and contain spills.

d) The following additional spill control and cleanup practices will be followed:
   - Spills will be contained and cleaned up immediately after discovery.

- Manufacturer's methods for spill cleanup of a material will be followed as described on the material safety data sheet (MSDS) (kept with product containers).
- Materials and equipment needed for cleanup procedures will be kept readily available on site, either at an equipment storage facility or on the contractor's trucks. Equipment to be kept on site will include, but not be limited to, brooms, dust pans, shovels, granular absorbents, sand, sawdust, absorbent pads and booms, plastic and metal trash containers, gloves, and goggles.
- On-site personnel will be made aware of cleanup procedures, the location of spill cleanup equipment, and proper disposal procedures.
- Toxic, hazardous, or petroleum product spills required to be reported by regulations will be documented and a record of the spills will be kept with this Project.
- If a spill occurs that is reportable to the federal, state, or local agencies, the contractor is responsible for making and recording the reports.

- **HAZ-3.** The following are measures to reduce the potential for fire:
  a) Smoking will be permitted only in designated smoking areas or within the cabs of vehicles or equipment.
  b) Every fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C, and all flammable materials will be removed from equipment parking and storage areas.
- **HYD-1.** The following BMPs will be implemented during the Project to avoid and minimize potential impacts on waters from erosion:
  a) Construction will occur only during dry periods.
  b) Prior to storm events, all construction activities shall cease and appropriate erosion control measures will be implemented.
  c) Soil, silt, or other organic materials will not be placed, stockpiled, or stored where such materials could pass into surface water or surface water drainage courses during unexpected rain events.
  d) All areas disturbed by Project activities will be protected from washout or erosion prior to the onset of the rainy season.
  e) All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.
  f) Prior to initiation of any waterside work, erosion control measures will be utilized throughout all phases of operation where silt and/or earthen fill threaten to enter waters of the U.S and/or state.

2 ENVIRONMENTAL IMPACTS

Each of the following resource sections includes a completed checklist (from Appendix G of the CEQA Guidelines) of environmental factors potentially affected and identifies potential Project impacts by significance level (i.e., no impact, less than significant impact, less than significant impact with mitigation incorporated, and potentially significant impact). The environmental factors checked in Table 2-1 would be potentially affected by this Project; mitigation measures will be implemented to reduce these potential impacts to less than significant levels.

Table 2-1. Summary of environmental factors potentially affected by the Project.

❑ Aesthetics	❑ Agricultural and Forest Resources	❑ Air Quality
✓ Biological Resources	❑ Cultural Resources	❑ Energy
❑ 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	❑ Utilities and Service Systems
❑ Mandatory Findings of Significance		

2.1 Aesthetics

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Except as provided in Public Resources Code Section 21099, would the Project:				
a) Have a substantial adverse effect on a scenic vista?	❑	❑	❑	✓
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	❑	❑	❑	✓
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings?	❑	❑	✓	❑
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	❑	❑	❑	✓

2.1.1 Environmental setting

The term "aesthetics" typically refers to the perceived visual character of an area, such as of a scenic view, open space, or architectural facade. The aesthetic value of an area is a measure of its visual character and visual quality combined with viewer response (FHA 1983). This combination may be affected by the components of a project (e.g., buildings constructed at heights that obstruct views, hillsides cut and graded, open space changed to an urban setting), as well as the length and frequency of viewer exposure to the setting. Aesthetic impacts are changes in viewer response as a result of Project construction and operation.

There are no designated scenic highways in the Project Area. The levee road along the Project Area is private, located behind a locked gate near Station 562+00. To the direction of the waterside, the levee road in the Project Area provides nearby views of Steamboat Slough. To the direction of the landward side, the levee road provides views of the subsided interior of the island, an area formerly used for dredged spoils and now mostly dominated by mature riparian forest and scrub-shrub. From Steamboat Slough and the Sacramento River near the Project Area, boaters have views of riparian forest along the levee.

2.1.2 Findings

a) Would the Project have a substantial adverse effect on a scenic vista?

Grand Island Road is not designated as a state scenic highway. State Highway 160, which spans the eastern perimeter of Grand Island, is designated as a state scenic highway and will not be directly affected by Project construction. There will be a very slight increase in traffic from haul trucks traveling between the Project Area and off-site commercial sources with imported levee repair materials. Increased truck traffic on State Highway 160 will not affect the existing value of the scenic vista. There will be no impact.

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

The Project Area is not located within a state scenic highway. There will be no impact.

c) In non-urbanized areas, would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings?

Construction activities will temporarily disrupt the visual character of the Project Area for boaters using Steamboat Slough or the Sacramento River near the Project Area. During Project construction, heavy equipment, including barges, will be used to add rock slope protection, the planting berm, and remove six trees from the levee slope, temporarily degrading the visual character and quality of the site. Construction will be visible for a very limited number of boaters or drivers using nearby Grand Island Road. Hydroseeding and planting will occur after Project completion in October or November. The level of re-planting used for this Project is expected to return riparian cover on-site to pre-Project levels within a few years. Because construction will be temporary (three or four weeks long), there will be a limited number of viewers, and the Project will not change the overall long-term visual character or aesthetic quality of the Project Area, effects will be less than significant.

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

There will be no nighttime construction or creation of a new source of substantial light or glare as a result of the Project. There will be no impact.

2.2 Agricultural and Forest Resources

Issues	Potentially significant impact	Less Than significant with mitigation incorporated	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 land?	❑	❑	❑	✓
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	❑	❑	❑	✓
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	❑	❑	❑	✓
d) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	❑	❑	❑	✓

2.2.1 Environmental setting

2.2.1.1 Farmland

The California Farmland Mapping and Monitoring Program (CFMMP), administered by the State Division of Land Resource Protection, is responsible for producing agricultural resource maps based on soil quality and land use. The purpose of the CFMMP is to provide information to be used in planning for current and future use of the state's agricultural lands. The CFMMP designates land into the following categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-up Land, Other Land, and Water. Descriptions of these categories are detailed in the CFMMP (California Department of Conservation 2015/2016).

The majority of Grand Island is designated by the CFMMP as Prime Farmland, including lands to the east of Project Area (CFMMP 2014). The Project Area, however, including the entire southwestern tip of Grand Island is identified as "Urban and Built-up Land," having previously been used as a disposal area for dredged spoils/fill from the Deep Water Shipping Channel Project.

Sacramento County has a goal to protect important farmlands from conversion and encroachment, and to conserve agricultural resources; protection measures are described in the Sacramento County General Plan (Sacramento County 2011).

2.2.2 Findings

a) Would the Project 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 land?

The Project will not impact existing land use and will not result in conversion of farmland to non-agricultural use. There will be no impact.

b) Would the Project conflict with existing zoning for agricultural use, or a Williamson Act contract?

The Project Area is not located under the Williamson Act contract (California Department of Conservation 2015/2016) for Prime and Non-Prime Agricultural land. There will be no impact.

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

No portion of Grand Island is zoned for forest land, timberland, or Timberland Production. There will be no impact.

d) Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No land in agricultural production will be used or impacted by the Project implementation. There will be no impact.

2.3 Air Quality

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	❑	❑	✓	❑
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or State ambient air quality standard?	❑	❑	✓	❑
c) Expose sensitive receptors to substantial pollutant concentrations?	❑	❑	❑	✓
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	❑	❑	❑	✓

2.3.1 Environmental setting

Grand Island is located in the southern region of the Sacramento Valley Air Basin (SVAB), which includes; Butte, Colusa, Glenn, Placer (western), Sacramento, Shasta, Solano (eastern), Sutter, Tehama, and Yolo counties, and is administered by the Sacramento Metropolitan Air Quality Management District (SMAQMD). The SVAB is bounded by mountainous areas to the east, west, and north, with an opening to the south into the Sacramento-San Joaquin Delta. The region experiences relatively long summers with generally hot and dry conditions, and short winters with cool, wet conditions. Subtropical high air pressure events can occur year-round and result in the formation of strong atmospheric inversion layers. The combination of these topographical and meteorological factors can prevent the dispersion of pollutants and are particularly conducive to poor air quality. Air quality data for the SVAB from 2014 to 2017 are summarized in Table 2-2 and describe the existing conditions for air quality in the Project vicinity.

Table 2-2. Summary statistics for air quality data in the SVAB from 2014 to 2017.

Year	Pollutant (averaging time)	Maximum concentration	No. of days exceeding federal standards	No. of days exceeding state standards
2014	Ozone (1 hour)	0.116 ppm	0	12
	Ozone (8 hour)	0.088 ppm	48	49
	NO_2 (daily)	0.064 ppm	0	0
	$PM_{2.5}$ (daily)	190.2 µg/m^3	7	n/a
	PM_{10} (daily)	106.4 µg/m^3	0	13
2015	Ozone (1 hour)	0.122 ppm	0	9
	Ozone (8 hour)	0.100 ppm	38	42
	NO_2 (daily)	0.059 ppm	0	0
	$PM_{2.5}$ (daily)	109.8 µg/m^3	11	n/a
	PM_{10} (daily)	118.0 µg/m^3	0	38
2016	Ozone (1 hour)	0.115 ppm	0	17
	Ozone (8 hour)	0.100 ppm	59	61
	NO_2 (daily)	0.056 ppm	0	0
	$PM_{2.5}$ (daily)	46.8 µg/m^3	5	n/a
	PM_{10} (daily)	88.9 µg/m^3	0	31
2017	Ozone (1 hour)	0.121 ppm	0	9
	Ozone (8 hour)	0.092 ppm	45	47
	NO_2 (daily)	0.061 ppm	0	0
	$PM_{2.5}$ (daily)	85.9 µg/m^3	11	n/a
	PM_{10} (daily)	242µg/m^3	1	38

Source: California Air Resources Board (CARB 2018)
$PM_{2.5}$ = respirable particulate matter (less than 2.5 microns in diameter)
PM_{10} = respirable particulate matter (less than 10 microns in diameter)
NO_2 = nitrogen dioxide
ppm = parts per million
ug/m^3 = micrograms per cubic meter of air
n/a = not available

The SVAB does not consistently meet several applicable air quality standards (CARB 2018). The entire air basin is currently designated as nonattainment for state daily PM_{10} standards, while Sacramento County is designated as moderate-transitional for federal PM_{10} standards (USEPA 2018). Except for Glenn and Colusa counties, the SVAB is designated as nonattainment for the state ozone standard, with Sacramento County also designated as nonattainment for the federal 8-hour ozone standard (USEPA 2018). The SVAB is in attainment for both state and federal standards pertaining to nitrogen oxide and carbon monoxide.

For some air quality constituents, impacts are determined based on the distance to the closest "sensitive receptor." The nearest sensitive receptors to the Project Area are Hidden Harbor Marina (a private boating facility at the confluence of Cache and Steamboat Sloughs) located over 500 ft away to the northwest of the Project Area, and two farm residences on Grand Island located approximately 0.3 to 0.5 miles away to the northeast of the Project Area. The next furthest sensitive receptors to the Project are residential homes and businesses in the city of Rio Vista (estimated population of 9,009), which is approximately 2.5 miles southwest of Grand Island.

2.3.2 Findings

This section describes the potential Project-related air quality effects, including exhaust emissions from construction equipment, fugitive dust generated by construction activities, and vehicle travel over unpaved roads. To complete the air quality analysis, information was collected on Project construction activities, duration, timing, and equipment use for the anticipated construction period, and used to run the Road Construction Emission Model Version 9.0.0 developed by the SMAQMD to estimate Project emissions.

The modeling was based on the material amounts and construction equipment assumptions described in Table 2-3, and: (1) a 1.5-acre Project Area; (2) a 1.0-acre maximum daily disturbance; (3) a total of 600 cubic yards of fill imported per day; (4) a round-trip distance of 50 miles for imported material; and (5) a 5-day work week at 12 hours per day, totaling approximately 20 days over the period of August 1 through October 31 in 2020 or 2021.

Table 2-3. Project emission sources and assumptions used to determine air emissions.

Emission source	Project assumptions
Imported material used for rock fill	9,333 cubic yards
Imported material used for soil fill	2,333 cubic yards
Imported material used for paving	500 cubic yards
Fuel-fired construction equipment	Excavator (1) Bulldozer (1) Haul trucks (10) Front-end loader (1) Water truck (1) Crane barge (1) Planting equipment (1)
Employee commute trips	4 employee trips/day, 25 miles each way

Additional model assumptions include all feasible SMAQMD best available control technology (BACT) and BMPs are applied and that all construction vehicles meet SMAQMD required emission reductions of 20% NO_x and 45% exhaust PM.

SMAQMD criteria air pollutants and precursors of primary concern for construction activity in California include ozone precursors (NO_x and ROG), PM_{10}, and $PM_{2.5}$. Carbon monoxide, sulfur dioxide, and lead are of less concern because construction activities are not likely to generate substantial quantities of these criteria air pollutants (SMAQMD 2018).

Emissions thresholds for criteria pollutants developed by the SMAQMD and the U.S. Environmental Protection Agency (USEPA) were used in determining the significance of Project-related air quality effects. Since the SMAQMD thresholds are more stringent than the USEPA thresholds, emissions would be considered significant if they exceeded the local thresholds established by the SMAQMD for construction activities. Thresholds established by the SMAQMD are:

- 85 pounds per day of NO_X (nitrogen oxides)
- No threshold established for construction phase ROG (reactive organic gas)

- 80 pounds per day of PM_{10} (summed for dust and exhaust)[1]
- 82 pounds per day of $PM_{2.5}$ (summed for dust and exhaust)[1]
- 1,100 metric tons per year GHG (greenhouse gas) as CO_2e (carbon dioxide equivalent)

Model results for the maximum daily emissions in pounds per day for the Project construction period are shown in Table 2-4.

Table 2-4. Maximum daily Project construction emission estimates (pounds per day).

	NO_X	ROG[1]	PM_{10}	$PM_{2.5}$	CO_2e[2]	NO_X
Project Construction	64.88	6.58	12.16	3.91	73.13	64.88
SMAQMD Threshold	85	n/a	80	82	1,100	85

[1] The SMAQMD has not adopted a ROG threshold for the construction phase of a project. The SMAQMD operational phase threshold for ROG is 65 pounds per day (SMAQMD 2018).
[2] The CO_2e value for Project construction is listed as total metric tons and the SMAQMD threshold in metric tons per year.

a) Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Based on the air quality modeling, construction of the Project is expected to result in temporary emissions that are well below state standards. There will be no change in long-term operational emissions. This impact will therefore be less than significant.

b) Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or State ambient air quality standard?

The model results show that Project is not expected to exceed the annual threshold criteria of pollutants for which the Project region is currently in non-attainment (including $PM_{2.5}$, PM_{10}, and ozone precursors [e.g. NO_x and ROG]). Although the Project will result in some emissions for which the SVAB is not in attainment, the minimal amount and temporary nature of these emissions will not result in a cumulatively considerable net increase of these pollutants. Therefore, this impact would be less than significant.

c) Would the Project expose sensitive receptors to substantial pollutant concentrations?

The construction of the Project is not expected to expose sensitive receptors to substantial pollutant concentrations. The nearest sensitive receptors are Hidden Harbor Marina and two farm residences on Grand Island, all located approximately within 0.5 miles away of the Project Area. The next nearest sensitive receptors are residential homes and businesses in the city of Rio Vista, CA, approximately 2.5 miles to the southwest of the Project Area. The Project will not result in substantial pollutant concentrations, as demonstrated by the modeling results and due to the temporary nature of Project construction. Therefore, the Project is expected to have no impact on exposing sensitive receptors to substantial pollutant concentrations.

[1] Represents threshold value if all feasible SMAQMD best available control technology (BACT) and best management practices (BMP) are applied; otherwise threshold is zero (0).

d) Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The construction of the Project is not expected to result in other emissions adversely affecting a substantial number of people, such as those leading to objectionable odors. Post-construction, the Project will not result in any change to current operation or maintenance of the levee. Therefore, the Project is expected to have no impact.

2.4 Biological Resources

Issues	Potentially significant impact	Less than significant with mitigation incorporated	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 Wildlife or U.S. Fish and Wildlife Service?	❑	✓	❑	❑
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	❑	❑	✓	❑
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	❑	❑	✓	❑
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?	❑	❑	✓	❑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	❑	❑	✓	❑
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?	❑	❑	❑	✓

2.4.1 Environmental setting

2.4.1.1 Methodology

Definitions

Special-status species are defined in this IS/MND as those that are:

- listed as endangered or threatened, rare, or proposed/candidates for listing under the ESA and/or CESA;
- designated by CDFW as a Species of Special Concern;
- designated by CDFW as Fully Protected under the California Fish and Game Code (Sections 3511, 4700, 5050, and 5515);
- designated as rare under the California Native Plant Protection Act (CNPPA); and/or
- included on CDFW's Special Vascular Plants, Bryophytes, and Lichens List with a California Rare Plant Rank (CRPR) of 1, 2, 3, or 4 (CDFW 2018a).

Sensitive natural communities (i.e., legacy natural communities in CDFW's CNDDB and vegetation alliances or associations as described in the online version of *A Manual of California Vegetation* [CNPS 2019]) are defined as vegetation types with a state ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) on CDFW's California Sensitive Natural Communities List (CDFW 2018b).

Desktop review

The special-status plant, fish, and wildlife species and sensitive natural communities with the potential to occur on or near the Project Area were identified through a query of the following sources:

- CDFW California Natural Diversity Database (CNDDB; CDFW 2018c);
- USFWS Information for Planning and Conservation (IPaC) portal (USFWS 2018);
- NMFS West Coast Region, California Species List Tool (NMFS 2018); and
- California Native Plant Society's (CNPS) online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2018).

These database queries were based on a search of the USGS 7.5-minute quadrangle in which the Project is located (Rio Vista), and the surrounding eight quadrangles (Liberty Island, Courtland, Isleton, Bouldin Island, Jersey Island, Antioch North, Birds Landing, and Dozier). The database query results are presented in Appendices A and B.

The habitat preferences and distributional range of each species from the database queries were compared with existing information and the results of field surveys to determine the potential for each species to occur in the Project Area, resulting in a refined list of species that may be impacted by the Project. If a species' required habitat was lacking from the Project Area or if the Project Area is outside the species' known distribution or elevation range, the species was considered not likely to occur.

Field surveys

On March 3, 2017, a site reconnaissance—including a habitat assessment for special-status wildlife and plant species—was conducted by two wildlife biologists (H. Burger and A. Misraraj) and two botanists (M. Keever and R. Thoms) from Stillwater Sciences.

A special-status plant survey and habitat mapping of the Project Area was conducted by Stillwater Sciences botanists (M. Keever and R. Thoms) on April 12, 2018 for early-blooming species and on June 6, 2018 for late-blooming species (by M. Keever and E. Elsey). Both efforts were performed during low tide for waterside surveys.

Surveys for special-status plant species were conducted in accordance with the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996) and *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* (CDFW 2018d). Specifically, surveys were comprehensive for vascular plants such that "every plant taxon that occurs in the project area [was] identified to the taxonomic level necessary to determine rarity and listing status" (CDFW 2018d). If identification was not possible in the field, the plants were collected for identification in the laboratory in accordance with government collecting regulations (using the "1 in 20" rule, Wagner 1995) or, if potentially a special-status plant, according to the botanists' current CDFW plant voucher collection permit guidelines (e.g., not more than five individuals or two percent of the population, whichever is less, for one voucher sheet). Vascular plants were identified following the taxonomy of the *Jepson eFlora* (Jepson Flora Project 2019). The timing of the botanical surveys covered the appropriate phenological state of all special-status plant species that may occur in the Project Area (Appendix A). A total of approximately 28 person-hours were spent on the botanical field surveys, which were floristic in nature (comprehensive) for vascular plants. CNDDB forms were completed for each documented special-status plant population for submission to CNDDB. Concurrent with the special-status plant surveys, surveys for blue elderberry (*Sambucus nigra*) were conducted following the USFWS (2017) framework for assessing impacts to the valley elderberry longhorn beetle.

A wetland delineation of the Project Area was conducted by Stillwater Sciences wetland specialists and botanists (M. Keever and E. Elsey) on June 6, 2018 to assess the water and wetland resources in the Project Area and delineate the boundaries of any Waters of the U.S., including wetlands, potentially subject to the jurisdiction of the USACE under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act (Stillwater Sciences 2019).

2.4.1.2 Results - Habitat types

Habitat types in the Project Area are summarized in Table 2-5 and depicted in Figure 2-1.

Table 2-5. Summary of habitat types in the Project Area.

Habitat type	Acres
Black locust	0.22
Himalayan blackberry	0.07
Open water	0.17
Riparian forest	0.62
Ruderal herbaceous	0.34
Scrub-scrub	0.07
Total	**1.49**

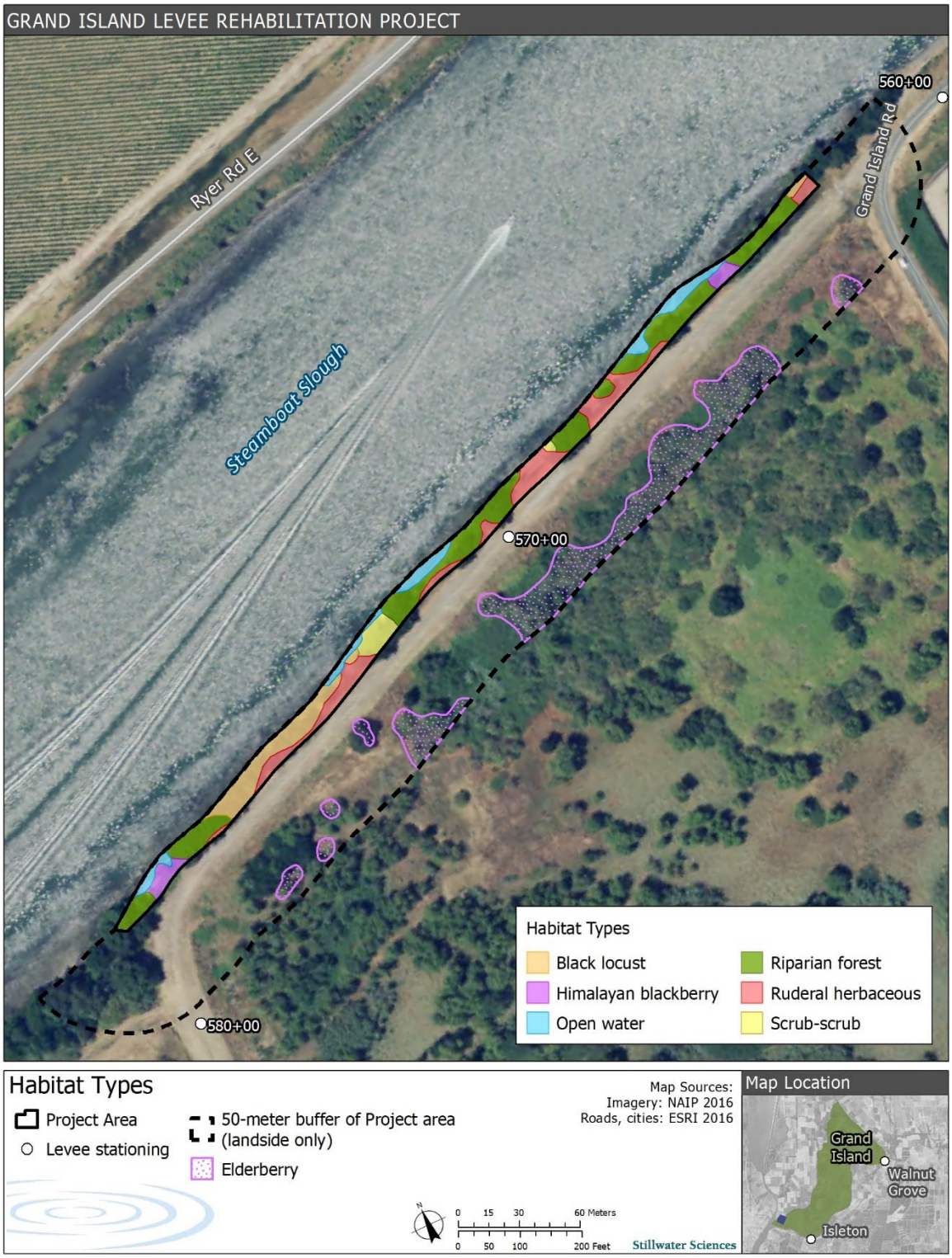

Figure 2-1. Habitat types in the Project Area, with blue elderberry within a 50-meter buffer.

The relatively large extent, diversity, and maturity of native riparian forest[2] and scrub-shrub[3] stands in the Project Area provide high habitat value to native fish and wildlife species. Black locust (*Robinia pseudoacacia*) and Himalayan blackberry (*Rubus armeniacus*) have been mapped separately from riparian forest and scrub-shrub, respectively, because they are both invasive, non-native species that outcompete native vegetation and do not provide high-quality habitat for native wildlife. The remainder of the Project Area is ruderal herbaceous vegetation that provides little habitat value, and open water, which provides critical aquatic habitat for several fish species.

Immediately south of the Project Area is the interior levee slope and the subsided interior of the island, an area formerly used for dredged spoils disposal, now dominated by mature riparian forest and scrub-shrub. Many mature elderberry shrubs (*Sambucus nigra* subsp. *caerulea*) were found outside of but within 50 meters of the Project Area (Figure 2-1), which may provide habitat for the federally threatened valley elderberry longhorn beetle.

Black locust

The black locust cover type is dominated by black locust trees, a non-native species with a California Invasive Plant Council (Cal-IPC) rating[4] of Limited, that often forms large stands that displace native vegetation through root sprouts and seedling establishment. In the Project Area, the black locust cover type is found in two distinct patches on the waterside of the levee. Where black locust overhangs Steamboat Slough, it may be classified as Shaded Riverine Aquatic (SRA) habitat which contributes to shading the water column and providing cover and foraging habitat for fish.

Himalayan blackberry

The Himalayan blackberry cover type is dominated by Himalayan blackberry shrubs, which often form dense thickets in open or closed canopies in mesic soils. This species is non-native and highly invasive with a Cal-IPC rating of High, often outcompeting and replacing native vegetation. In the Project Area, Himalayan blackberry is found in two distinct patches along the waterside of the levee.

Open water/aquatic habitat

Open water, having exposed surface water, is present in Steamboat Slough along the waterside of the levee and comprises the majority of aquatic habitat found in the Project Area. Steamboat Slough provides aquatic habitat consisting primarily of deep riverine habitat, with lesser amounts of shallower habitat with sand substrate and limited submerged aquatic vegetation in the Project Area along the shoreline. Moderate amounts of high-quality aquatic habitat are present along the shoreline where abundant overhanging riparian canopy heavily shades the channel margin and a high density of instream woody material and other vegetation provides extensive and complex instream habitat. This complex nearshore structure is inundated regularly by the tidal cycle at the

[2] Assembly Bill (AB) 360, which calls for "net long-term habitat improvement" (as defined in Water Code section 12310), defines riparian forest habitat as woody vegetation (including isolated trees or shrubs) greater than 20 ft in height that may or may not overhang the water's edge. Often there is a dense, shrubby understory. The most common trees in the Delta include cottonwood, sycamore, alder, Oregon ash, willows, box elder, black walnut and various oaks.

[3] AB 360 defines scrub-shrub habitat as stands of woody vegetation predominantly less than 20 ft in height. The various tree and shrub species that make up scrub-shrub are generally the same as for riparian forest, although in most instances alders and or willows are the dominant plants.

[4] The Cal-IPC Inventory (Cal-IPC 2018) categorizes plants that threaten California's natural areas. The Inventory includes plants that currently cause damage in California (invasive plants) as well as "Watch" plants that are a high risk of becoming invasive in the future.

site, providing the complex cover habitat which native fishes, namely juvenile salmonids, require to carry out key behaviors such as foraging, hiding from predators, and sheltering from high water velocity (Figure 2-2). The usability, extent, and quality of cover habitat vary with river stage due to tides.

Figure 2-2. Aquatic habitat in the Project Area is composed of open water, submerged aquatic vegetation (left), and shaded riverine aquatic (SRA) cover (right).

Ruderal herbaceous

The ruderal herbaceous cover type is dominated by non-native herbaceous forb and grass species and is often found in disturbed sites. Ruderal herbaceous areas generally do not provide high-quality wildlife habitat—particularly for special-status species—but seeds of various grasses and forbs may be a food source for some wildlife species.

In the Project Area, ruderal herbaceous vegetation is found on the levee crown and portions of the levee slope, from nearly barren on levee roads to almost 100% cover in semi-shaded areas. Many species found within this habitat type in the Project Area are rated by Cal-IPC as Limited, Moderate, or High. Dominant plant species include non-native ripgut grass (*Bromus diandrus*; Cal-IPC Moderate) and Bermuda grass (*Cynodon dactylon*; Cal-IPC Moderate). Dominant non-native forbs include bur-chervil (*Anthriscus caucalis*), perennial pepperweed (*Lepidium latifolium*; Cal-IPC High), radish (*Raphanus sativus*; Cal-IPC Limited), and blessed milkthistle (*Silybum marianum*; Cal-IPC Limited).

Riparian forest

Riparian forest in the Project Area is dominated by tree species with a moderate to closed canopy along riparian corridors. Mature trees in riparian forest may provide cover, roosting, foraging, and nesting habitat for raptors, songbirds, sparrows, and other migratory birds and raptors. Where riparian forest overhangs river surfaces, it is classified as SRA habitat, which shades the water column, provides cover and foraging habitat for numerous fish species, and food web support for the aquatic ecosystem.

In the Project Area, the riparian forest cover type is the most prevalent cover type, where large patches with mostly closed canopies cover nearly 42% of the Project Area, spanning the full width from waterline to the levee crown. Dominant plant species include interior live oak (*Quercus wislizeni*), Northern California black walnut (*Juglans hindsii*), and valley oak (*Quercus lobata*), with white alder (*Alnus rhombifolia*) as a subdominant species. Native woody species found in the understory include California wild grape (*Vitis californica*), California rose (*Rosa californica*), and narrowleaf willow (*Salix exigua*). The herbaceous layer generally includes ripgut grass (*Bromus diandrus*; Cal-IPC Moderate), blessed milkthistle (Cal-IPC Limited) and perennial pepperweed (Cal-IPC High). Riparian forest provides most of the SRA habitat in the Project Area.

Scrub-shrub

Scrub-shrub vegetation is dominated by woody species and is often found in mesic soils and along riparian corridors. Scrub-shrub provides cover, foraging, and nesting habitat for wildlife including birds and mammals. In the Project Area, scrub-shrub habitat is patchily distributed along the waterside of the levee and occasionally up to the levee crown. Dominant plant species include mule fat (*Baccharis salicifolia*), arroyo willow (*Salix lasiolepis*), narrowleaf willow (*Salix exigua*), and California wild grape (*Vitis californica*). Where scrub-shrub overhangs river surfaces in the Project Area, it may be classified as SRA habitat, contributing the same riparian functions as SRA provided by riparian forest.

2.4.1.3 Results - Waters and wetlands

The 1.49-acre Project Area contains 0.94 acres of Waters of the U.S. and no wetlands (Stillwater Sciences 2019). The Waters of the U.S., associated with Steamboat Slough, are classified as intertidal estuarine unconsolidated shore based on the wetland classification standard (FGDC 2013).

2.4.1.4 Results - Special-status species

Plants and natural communities

One population of the special-status plant species, Suisun Marsh aster (*Symphyotrichum lentum*), was documented within the Project Area during 2018 botanical surveys (Table 2-6). Two additional special-status plants had been recorded as documented within the Project Area (CDFW 2018c) but were not found during 2018 botanical surveys: (1) Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), which was most likely previously mis-identified (as the sister taxon and common species, *Lathyrus jepsonii* var. *californicus* was documented in the Project Area), and (2) Mason's lilaeopsis (*Lilaeopsis masonii*), which was not found within the Project Area during low-tide botanical surveys. No sensitive natural communities were documented within the Project Area. Appendix C provides a comprehensive list of plants documented in the Project Area during the botanical surveys.

Table 2-6. Special-status plant population documented in the Project Area.

Scientific name	Common name	Status[1] Federal/State/CRPR	Subpopulation Patch ID	Number of individuals
Symphyotrichum lentum	Suisun Marsh aster	–/–/1B.2	SYLE 01	10
			SYLE 02	4
			SYLE 03	3
			SYLE 04	5
			SYLE 05	7
			SYLE 06	1
			SYLE 07	5
Total				**35**

[1] Status:
California Rare Plant Rank (CRPR):
1B Plants rare, threatened, or endangered in California and elsewhere
CRPR Threat Rank:
0.2 Fairly threatened in California (moderate degree/immediacy of threat)

The Suisun Marsh aster population documented in the Project Area was found across seven discrete patches containing a total of 35 Suisun Marsh aster plants along the waterside of the levee at or just above mean higher high water (Table 2-6, Figure 2-3). This population is part of the previously documented occurrence #180 (CDFW 2018c).

Suisun Marsh aster is a perennial rhizomatous herb in the sunflower (Asteraceae) family that has a CRPR of 1B.2 (i.e., rare, threatened, or endangered in California and elsewhere; moderately threatened in California), but is not federally or otherwise state-listed. It is endemic to California, occurring below 10 ft in elevation within the southern Sacramento Valley, the Delta, and eastern San Francisco Bay in Contra Costa, Napa, Sacramento, San Joaquin, Solano, and Yolo counties (CNPS 2018). Suisun Marsh aster typically occurs in brackish and freshwater marshes and swamps and blooms from May (sometimes as early as April) to November (CNPS 2018). This species is threatened by habitat alteration and loss as well as erosion, and possibly threatened by herbicide application and competition from non-native plants (CNPS 2018).

Figure 2-3. Subpopulation patches of Suisun Marsh aster, a special-status plant documented in the Project Area in 2018.

Fish

Eight special-status fish species were identified from the database queries as potentially occurring in the Project region (Appendix B). One species had low potential to occur in or near the Project Area because no suitable habitat is present. The seven remaining fish species with moderate or high potential to occur in or near the Project Area are listed in Table 2-7. These species are discussed in detail below, including listing status, habitat associations, and notable life history requirements.

Table 2-7. Special-status fish species with moderate to high potential to occur in the Project Area.

Common name (*Scientific name*)	Status federal/state	Likelihood to occur in the Project Area
Sacramento splittail (*Pogonichthys macrolepidotus*)	none/state species of special concern	high
Chinook salmon (*Oncorhynchus tshawytscha*), Sacramento River winter-run ESU	federally endangered/ state endangered	high
Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run ESU	federally threatened/ state threatened	high
Steelhead (*Oncorhynchus mykiss*), Central Valley DPS	federally threatened/ none	high
North American green sturgeon (*Acipenser medirostris*), southern DPS	federally threatened/ none	high
Delta smelt (*Hypomesus transpacificus*)	federally threatened/ state endangered	high
Longfin smelt (*Spirinchus thaleichthys),* San Francisco Bay-Delta DPS	federal candidate/state threatened	high

ESU = Evolutionarily Significant Unit
DPS = Distinct Population Segment

Sacramento splittail. Sacramento splittail is a CDFW species of special concern. Adults typically migrate upstream from brackish areas in January and February and spawn in freshwater on inundated floodplains in March and April (Moyle et al. 2004). A significant amount of spawning occurs in the Yolo and Sutter bypasses and the Cosumnes River area of the Delta (Moyle et al. 2004). However, not all adults migrate significant distances to spawn, as evidenced by spawning in Suisun Marsh (Meng and Matern 2001). Although juvenile splittail are known to rear in upstream areas for a year or more (Baxter 1999), most juveniles may move downstream into the shallow, more productive Delta from April through August (Meng and Moyle 1995). Non-reproductive adult splittail are most abundant in moderately shallow, brackish tidal sloughs but can also be found in freshwater areas with tidal or riverine flow (Moyle et al. 2004).

Adult and juvenile rearing habitat consists of shallow, low-velocity areas throughout the Delta, and particularly in the western Delta and Suisun Marsh (Moyle et al. 2004). Although some spawning may occur in the margins of the main channels every year, spawning and larval rearing primarily occur on inundated floodplains (ICF International 2013). Young-of-the-year and yearling splittail are generally most abundant in shallow water (Moyle 2002).

Sacramento splittail may occur year-round in the Project Area as adults, sub-adults, or juveniles, likely using the shallow, vegetated nearshore habitats for rearing and foraging. Splittail do not likely spawn in the Project Area, since they prefer inundated floodplain habitat; however, splittail may use nearshore emergent freshwater marsh areas for spawning in low-water years. Spawning occurs between February and May (Moyle et al. 2004).

Sacramento River winter-run Chinook salmon ESU. Sacramento River winter-run Chinook salmon ESU are federally and state-listed as endangered. Sacramento River winter-run Chinook salmon spend one to three years in the ocean; adults then leave the ocean and migrate through the Bay-Delta into the Sacramento River from December through July with peak migration in March (Moyle 2002). Adults spawn from mid-April through August (Moyle 2002). Egg incubation continues through October. The primary spawning habitat in the Sacramento River is above Red Bluff Diversion Dam at River Mile 243, although spawning has been observed downstream as far as River Mile 218 (NMFS 2001). Spawning success below Red Bluff Diversion Dam may be limited primarily by warm water temperatures (Hallock and Fisher 1985, Yoshiyama et al. 1998).

Downstream movement of juvenile Sacramento River winter-run Chinook salmon begins in August, soon after fry emerge. In September and October, the abundance of juveniles moving downstream peaks at Red Bluff (Vogel and Marine 1991). Juvenile Chinook salmon move downstream from spawning areas in response to many factors, which may include inherited behavior, habitat availability, flow, competition for space and food, and water temperature. The number of juveniles that move as well as the time of movement are highly variable. Storm events and the resulting high flow and turbidity appear to trigger downstream movement of substantial numbers of juvenile Chinook salmon. In the winter in the Sacramento/San Joaquin system, juveniles rear on seasonally inundated floodplains. Sommer et al. (2001) found higher growth rates of juvenile Chinook salmon that reared on the Yolo Bypass floodplain than in the mainstem Sacramento River.

Little is known about the extent to which juvenile Chinook salmon use the Delta as rearing habitat (Williams 2006), but the prevailing theory is that Sacramento River winter-run Chinook salmon use the north Delta primarily as a migration corridor. Adults migrate through the Delta from December through July with peak migration in March (Moyle 2002) while juveniles migrate through the Bay-Delta from October through May (Yoshiyama et al. 1998, NMFS 2016a). Juvenile Chinook salmon use the Project Area as a migratory pathway as they emigrate to the Pacific Ocean. MacFarlane and Norton (2002) found that juveniles typically spent 40 days migrating through the Delta to the mouth of San Francisco Bay, but grew little in length or weight until they reached the Gulf of the Farallones. The Sacramento River channel is the main migration route through the Bay-Delta for adults and juveniles. However, the Yolo Bypass also provides significant outmigration passage during higher flow events. Juvenile outmigration timing is thought to be strongly correlated with winter rain events that result in higher flows in the Sacramento River, and abundance in the Bay-Delta generally increases in response to increased Sacramento River flow (USFWS 1993).

Juvenile Sacramento River winter-run Chinook salmon may occur seasonally within the Project Area, as it is between both major migratory routes. Adult Sacramento River winter-run Chinook salmon may also migrate through the Project vicinity but are likely to seek deeper water than that in the Project Area during their migration through the Delta. Fish monitoring efforts conducted annually from 2014–2018 captured juvenile Sacramento River winter-run Chinook salmon within five miles of the Project Area during the months of January–March (https://www.wildlife.ca.gov/Regions/3).

Central Valley spring-run Chinook salmon ESU. Central Valley spring-run Chinook salmon ESU is federally and state-listed as threatened. Adult Central Valley spring-run Chinook salmon enter the mainstem Sacramento River from March through September, with the peak upstream migration occurring from May through June (Yoshiyama et al. 1998). Central Valley spring-run Chinook salmon are sexually immature during upstream migration, and adults hold in deep, cold pools near spawning habitat until spawning commences in late summer and fall. Central Valley spring-run Chinook salmon spawn in the upper reaches of the mainstem Sacramento River and tributary streams (USFWS 1995), with the largest tributary runs occurring in Butte, Deer, and Mill creeks (Yoshiyama et al. 1998). Spawning typically begins in late August and may continue through October. Juveniles emerge in November and December in most locations but may emerge later when water temperature is cooler. Newly emerged fry remain in shallow, low-velocity edgewater (CDFG 1998).

Juvenile Central Valley spring-run Chinook salmon typically spend up to one year rearing in fresh water before migrating to sea as yearlings, but some may migrate downstream as young-of-year juveniles. Rearing takes place in their natal streams, the mainstem of the Sacramento River, inundated floodplains (including the Sutter and Yolo bypasses), and the Bay-Delta. Based on observations in Butte Creek and the Sacramento River, young-of-year juveniles typically migrate from November through May. Yearling Central Valley spring-run Chinook salmon migrate from October to March, with peak migration in November (Cramer and Demko 1997, Hill and Webber 1999). Downstream migration of yearlings typically coincides with the onset of the winter storm season, and migration may continue through March (CDFG 1998).

Central Valley spring-run Chinook salmon are thought to use the north Delta region primarily as a migration corridor but may rear there more extensively than other ESUs (NMFS 2016b). According to Allen and Hassler (1986) as Chinook salmon increase in size, they begin to school in surface waters of secondary channels and sloughs. Within the Delta, juvenile Chinook salmon forage in shallow areas with protective cover, such as intertidal and subtidal mudflats, marshes, channels, and sloughs (McDonald 1960, Dunford 1975). Young-of-year and yearling juvenile Central Valley spring-run Chinook salmon migrate downstream from October to May (Cramer and Demko 1997, Hill and Webber 1999). Adult escapement typically occurs from April through June and may extend into early summer (NMFS 2016b). A subset of Central Valley spring-run Chinook salmon rear in their natal stream for up to a year before outmigrating. These fish may enter the Delta as early as November or December and continue outmigration through March.

Juvenile Central Valley spring-run Chinook salmon may use the Project Area on a seasonal basis as they migrate through the Delta. Adult Central Valley spring-run Chinook salmon may also migrate through the Project vicinity but are likely to seek deeper water than that in the Project Area during their migration through the Delta. Fish monitoring efforts conducted annually from 2014–2018 captured juvenile Central Valley spring-run Chinook salmon within five miles of the Project Area during the months of January–May (https://www.wildlife.ca.gov/Regions/3).

Central Valley steelhead DPS. Steelhead in the Central Valley steelhead DPS are federally listed as threatened. Central Valley steelhead have one of the most complex life histories of any salmonid species, exhibiting both anadromous and freshwater resident life histories. Freshwater residents typically are referred to as rainbow trout, and those exhibiting an anadromous life history are called steelhead (NMFS 1998). Steelhead exhibit highly variable life history patterns throughout their range but are broadly categorized into winter and summer reproductive ecotypes. Winter steelhead, the most widespread reproductive ecotype and the only type currently present in Central Valley streams (McEwan and Jackson 1996), become sexually mature in the ocean,

enter spawning streams in summer, fall or winter, and spawn a few months later in winter or late spring (Meehan and Bjornn 1991, Behnke 1992).

In the Sacramento River, adult winter steelhead migrate upstream during most months of the year, beginning in July, peaking in September, and continuing through February or March (Hallock 1987). Spawning occurs primarily from January through March but may begin as early as late December and may extend through April (Hallock 1987). Individual steelhead may spawn more than once, returning to the ocean between each spawning migration. Steelhead may spawn more than one season before dying (iteroparity), in contrast to other species of the *Oncorhynchus* genus.

Cover is an important habitat component for juvenile steelhead, both as velocity refuge and as a means of avoiding predation (Shirvell 1990, Meehan and Bjornn 1991). Steelhead, however, tend to use riffles and other habitats not strongly associated with cover during summer rearing more than other salmonids. In winter, they become inactive and hide in any available cover, including gravel or woody debris.

Juvenile steelhead rear a minimum of one and typically two or more years in fresh water before migrating to the ocean during smoltification (the process of physiological change that allows ocean survival). Juvenile migration to the ocean generally occurs from December through August and peaks from January to May (McEwan 2001). The importance of main channel and floodplain habitats to steelhead in the lower Sacramento River and upper Bay-Delta is not well understood.

Juvenile Central Valley steelhead may use the Project Area on a seasonal basis as they migrate through the Delta. Adult Central Valley steelhead may also migrate through the Project vicinity but are likely to seek deeper water than that in the Project Area during their migration through the Delta. Fish monitoring efforts conducted annually from 2014–2018 captured juvenile Central Valley steelhead within five miles of the Project Area during the months of February–April (https://www.wildlife.ca.gov/Regions/3).

North American green sturgeon sDPS. The sDPS of green sturgeon is listed as federally threatened. Green sturgeon are anadromous, but are the most marine-oriented of the sturgeons and have been found in nearshore marine waters from Mexico to the Bering Sea (70 FR 17386). The sDPS has a single spawning population in the Sacramento River (NMFS 2005). Adults typically migrate upstream into rivers between late February and late July. Spawning occurs from March to July, with peak spawning from mid-April to mid-June (Moyle 2002). Green sturgeon are believed to spawn every three to five years, although recent evidence indicates that spawning may be as frequent as every two years (70 FR 17386). Little is known about the specific spawning habitat preferences of green sturgeon. It is believed that adult green sturgeon broadcast their eggs in deep, fast water over large cobble substrate where the eggs settle into the interstitial spaces (Moyle 2002). Spawning is generally associated with water temperatures from 46 to 57ºF. In the Central Valley, spawning occurs in the Sacramento River upstream of Hamilton City, perhaps as far upstream as Keswick Dam (Adams et al. 2002), and possibly in the lower Feather River (Moyle 2002).

Green sturgeon eggs hatch in approximately eight days at 55ºF (Moyle 2002). Larvae begin feeding 10 days after hatching. Metamorphosis to the juvenile stage is complete within 45 days of hatching. Juveniles spend one to four years in fresh and estuarine waters and migrate to saltwater at lengths of 12–30 inches (70 FR 17386).

Little is known about movements, habitat use, and feeding habits of green sturgeon. The fact that green sturgeon have been salvaged at the state and federal fish collection facilities in every month indicate that they are present in the Bay-Delta year-round (70 FR 17386). In the Sacramento River Delta, juveniles were captured primarily in water from 3–8 ft deep (Radtke 1966). Juveniles and adults are reported to feed on benthic invertebrates, including shrimp and amphipods, and small fish (70 FR 17386).

Adult green sturgeon may migrate upstream between late February and late July but are most likely to be found in deep water outside of the Project Area. Juvenile green sturgeon may use the north Delta year-round for rearing and as a migration corridor and are typically found at depths from 3 to 8 ft deep (Radtke 1966).

Delta smelt. Delta smelt are federally listed as threatened and state-listed as endangered. Delta smelt are endemic to the Sacramento-San Joaquin estuary and are found seasonally in Suisun Bay and Suisun Marsh (Moyle 2002). They typically are found in shallow water (less than 10 feet deep) where salinity ranges from 2 to 7 parts per thousand (ppt), although they have been observed at salinities between 0 and 18.4 ppt (Moyle 2002). Delta smelt have relatively low fecundity and most live for one year (Moyle 2002). They feed on planktonic copepods, cladocerans, amphipods, and insect larva (Moyle 2002).

Adults begin migrating upstream to spawn following flow pulses that typically occur from December to March (Grimaldo et al. 2009). Spawning can occur between February and July, but peak spawning occurs from March through May (Moyle 2002, Bennett 2005). Although specific spawning locations in the Bay-Delta have not been identified, they have been inferred from larval catches (Bennett 2005), which have occurred in Montezuma Slough (Wang 1986), Suisun Slough in Suisun Marsh (Moyle 2002), the Napa River estuary (Stillwater Sciences 2006), the Sacramento River above Rio Vista, and Cache, Lindsey, Georgiana, Prospect, Beaver, Hog, Sycamore, and Barker sloughs (USFWS 1996). Spawning was also observed in the Sacramento River up to Garcia Bend during drought conditions as a result of increased saltwater intrusion that moved delta smelt spawning and rearing farther inland (Wang and Brown 1993).

Laboratory experiments have found eggs to be adhesive, demersal, and usually attached to substrate which would likely be composed of gravel, sand, or other submerged material (Moyle 2002, Wang 1991). Hatching takes approximately 9 to 13 days, and larvae begin feeding 4 to 5 days later (Moyle 2002). Newly hatched larvae contain a large oil globule that makes them semi-buoyant and allows them to stay near the bottom (Moyle 2002). As their fins and swim bladder develop, they move higher into the water column and may be washed downstream to the open waters of the estuary (Moyle 2002).

Despite conventional understanding suggesting a uniform downstream migration of juveniles, evidence from Sommer et. al. (2011) and Nobriga et al. (2008) indicates delta smelt have a year-round presence in upstream areas of the Delta (e.g., Cache Slough near the Project). However, owing to a small geographic range, it is unknown whether their presence in these areas is due to residence of juveniles in spawning areas or routine movements of the species within its range (Sommer et al. 2011). Ultimately, this evidence supports the hypothesis that delta smelt exhibit alternative life histories that confer greater species resilience.

Delta smelt may occur within the Project Area throughout the year. Delta smelt have been observed during each month of the year when sampling was conducted upstream of the Project Area in Cache Slough (no sampling occurred in August) and downstream of the Project Area approximately 5 miles downstream of Rio Vista (sampled every month of the year) (Sommer et.

al. 2011). Over the past five years (2014–2018), delta smelt have only been documented during January–July during monitoring efforts conducted within five miles of the Project Area (https://www.wildlife.ca.gov/Regions/3). Capture of larval fish above Rio Vista (USFWS 1996) suggests spawning may occur in the Project Area, however, spawning activity is limited to February through July (Moyle 2002, Bennett 2005).

San Francisco Bay-Delta longfin smelt DPS. San Francisco Bay-Delta longfin smelt are a candidate species for federal listing. Longfin smelt spend their adult life in bays, estuaries, and nearshore coastal areas, and migrate into freshwater rivers to spawn. While longfin smelt is a euryhaline species tolerant of salinities ranging from nearly pure seawater to fresh water, individuals seem to prefer salinities in the range of 15–30 ppt once they pass early life stages (Moyle 2002). Individuals mature by the end of their second year of life and migrate upstream to the Sacramento-San Joaquin Delta to spawn. The general spawning region is believed to be downstream of Rio Vista on the Sacramento River and downstream of Medford Island on the San Joaquin River, to just downstream of the confluence of these two rivers (Moyle 2002).

Spawning occurs in fresh water during the winter to early spring (February through April) over sandy or gravel substrate. Most smelt die after spawning, but a few (mostly females) may live another year. The eggs are adhesive and hatch in 40 days when water temperatures are 7°C (44°F). Newly hatched larvae are 0.2–0.3 inches long. Larvae (individuals less than 0.8 inches in length) can be moved downstream to estuaries by high flows but may also spend considerable time in fresh water. Very few larvae are found in salinities greater than 8 ppt. Until they reach about 0.5–0.6 inches, longfin smelt larvae are concentrated in the upper one-third of the water column (CDFG 1992 as cited in CDFG 2009, Bennett et al. 2002). They later descend and tend to occupy the lower two-thirds of the water column (CDFG 1992 as cited in CDFG 2009, Bennett et al. 2002). It takes almost three months for longfin smelt to reach the juvenile stage (USFWS 2012).

Longfin smelt occur in the San Francisco Estuary, including the Delta, as well 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). Juvenile and adult longfin smelt have been found throughout the year in freshwater, although once past the juvenile stage, they are typically collected in waters with salinities ranging from 14 to 28 ppt (Baxter 1999). Annual monitoring efforts within five miles of the Project Area captured longfin smelt during the months of January–April (https://www.wildlife.ca.gov/Regions/3).

Summary of fish species and life-history timing. Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and green sturgeon sDPS use the Sacramento River as a migration corridor and have the potential to travel past the Project Area. Adult Sacramento River winter-run Chinook salmon migrate through the Bay-Delta into the Sacramento River from December through July, peaking in March (Moyle 2002), and juveniles migrate through the Bay-Delta from October through May (Yoshiyama et al. 1998, NMFS 2016a). Central Valley spring-run Chinook salmon migrate upstream into the Sacramento River from March through September, peaking in May through June (Yoshiyama et al. 1998). Young-of-year and yearling juvenile Central Valley spring-run Chinook salmon migrate downstream from October to May (Cramer and Demko 1997, Hill and Webber 1999). Central Valley steelhead adults migrate upstream through the Sacramento River from July through March (Hallock 1987); juveniles emigrate downstream from December through August, with peak months being January to May (McEwan 2001). Adult green sturgeon migrate upstream between February and July, while juveniles may be present throughout the year.

Delta smelt may occur within the Project Area throughout the year. Longfin smelt spawning migrations into the Delta occur from November through June, with peak spawning occurring from February through April (Moyle 2002). Downstream movement of longfin smelt occurs during the late winter, spring, and early summer (Bay Institute 2007).

Table 2-8 illustrates the fish species timing in the Project Area. The proposed in-water work period is between August and October (bracketed by heavy lines). Juvenile rearing and/or juvenile migratory life stages of the following species may be present in the Project Area during this timeframe: Sacramento River winter-run Chinook, Central Valley spring-run Chinook, Central Valley steelhead, green sturgeon sDPS, and delta smelt. Adult Sacramento River winter-run Chinook salmon are unlikely to occur during this timeframe. While the potential timing of adult migratory life stages of Central Valley spring-run Chinook salmon and Central Valley steelhead overlaps with a portion of this in-water work period, the occurrence of these salmonids is expected to be very low because this timeframe coincides with the either the beginning or the end of the migration period. Furthermore, migrating adult salmonids are expected to use deeper water habitat than what is available in the Project Area.

Table 2-8. Timing of listed fish species life stages near the Project Area (**bracketed heavy lines** indicate the proposed in-water work period of August and October).

Species ESU/DPS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chinook salmon												
Sacramento River winter-run ESU												
Adult Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Juvenile Rear/Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Central Valley spring-run ESU												
Adult Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Juvenile Rear/Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Steelhead - Central Valley DPS												
Adult Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Juvenile Rear/Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
North American green sturgeon – Southern DPS												
Adult Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Juvenile Rear/Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Delta smelt												
Adult Migration	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Spawning	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Larval/Juvenile Rearing	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Longfin smelt - San Francisco Bay-Delta DPS												
Spawning	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Rearing	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓

Wildlife

Twenty-nine special-status wildlife species were identified from database queries as potentially occurring in the Project region (Appendix B). Twenty-three of these species have no or low potential to occur in or near the Project Area because no suitable habitat is present, the Project Area is outside of the species' known range, and/or potential habitat was of low quality (Appendix B). The six remaining wildlife species with moderate or high potential to occur in or near the Project Area are listed in Table 2-9. These species are discussed in detail below, including listing status, habitat associations, and notable life history requirements. In addition to the species described below, other common and special-status amphibians, reptiles, birds, and mammals may use the study area for foraging, cover, dispersal, and breeding.

Table 2-9. Special-status wildlife species with moderate to high potential to occur in the Project Area.

Common name (*Scientific name*)	Status federal/state	Likelihood to occur in the Project Area
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	federally threatened/none	moderate
Western pond turtle (*Actinemys marmorata*)	none/state species of special concern	high
White-tailed kite (*Elanus leucurus*)	none/state fully protected	moderate
Swainson's hawk (*Buteo swainsoni*)	none/state threatened	moderate
Song sparrow ("Modesto" population) (*Melospiza melodia*)	none/state species of special concern	moderate
Western red bat (*Lasiurus blossevillii*)	none/state species of special concern	High

Valley elderberry longhorn beetle. Valley elderberry longhorn beetle is federally listed as threatened. Blue elderberry (*Sambucus nigra* subsp. *caerulea*) is the primary host plant for valley elderberry longhorn beetle. It is common along streambanks and in open places in forest throughout the California floristic province below 9,843 ft, and blooms from March to September (Baldwin et al. 2012). Larvae feed on tree pith, while adults eat the foliage and possibly the flowers of the plants. The adult stage of the valley elderberry longhorn beetle is short-lived, and most of the life cycle is spent in the larval stage (USFWS 1999). The adults are active from early March through early June with mating occurring in May (Barr 1991). Eggs are laid singly, or in small groups, in crevices in elderberry bark and hatch in about 10 days (Barr 1991). Larvae bore into the pith of elderberry roots, branches, and trunks to create an opening in the stem within which they pupate, remaining in this stage for one to two years before emerging as adults (Barr 1991, USFWS 1999). After metamorphosing into an adult, the beetle chews a circular exit hole through which it emerges, sometime during the period of late March to June (Barr 1991, USFWS 1999). It has been suggested that the beetle is a poor disperser, based on the spatial distribution of occupied shrubs (USFWS 1997).They are most vulnerable during the 1–2 months when the plant is flowering and the adult emerges from the exit hole, typically between mid-March and mid-May (Sacramento County DRPROS 2002).

The beetle may be present in an area despite lack of evidence of emergence holes in host plants, because the beetle may disperse to trees that do not yet contain emergence holes (Kellner 1992). Therefore, the locations of elderberry trees may provide a more accurate indication of the presence of the beetle (Kellner 1992).

Numerous mature elderberry shrubs were found outside, but within 50 meters, of the Project Area, and are shown in Figure 2-1. These elderberries may provide habitat for Valley elderberry longhorn beetle.

Western pond turtle. Western pond turtle, a CDFW Species of Special Concern, inhabits fresh or brackish water characterized by areas of deep water, low flow velocities, moderate amounts of riparian vegetation, warm water and/or ample basking sites, and underwater cover elements, such as large woody debris and rocks (Jennings and Hayes 1994). Along major rivers, western pond turtles are often concentrated in side channel and backwater areas. Turtles may move to off-channel habitats, such as oxbows, during periods of high flows (Holland 1994). Although adults are habitat generalists, hatchlings and juveniles require specialized habitat for survival through their first few years. Hatchlings spend much of their time feeding in shallow water with dense submerged or short emergent vegetation (Jennings and Hayes 1994). Although an aquatic reptile, western pond turtles require upland habitats for basking, overwintering, and nesting, typically within 0.6 mile from aquatic habitats (Holland 1994).

There is highly suitable western pond turtle aquatic and basking habitat in the Project Area in Steamboat Slough, including on exposed tree roots, logs, and other large woody material. There is suitable upland nesting habitat along the land side of the levee particularly in grassland areas with ample exposure to sun. Turtles may migrate overland through the Project Area to terrestrial nesting habitats. While the nearest CNDDB record for this species is 4 miles to the east of the Project Area (CDFW 2018c), western pond turtles are frequently observed throughout the Delta.

Modesto song sparrow. The "Modesto" population of song sparrow (*Melospiza melodia*) (hereafter referred to as Modesto song sparrow) is a year-round resident of California and a CDFW Species of Special Concern. This population is endemic to the north-central portion of the Central Valley, locally abundant in the Sacramento–San Joaquin River Delta and Butte Sink areas. The Modesto song sparrow occupies freshwater marsh, riparian woodland, and riparian scrub habitats, as well as vegetated irrigation canals and levees (Gardali 2008). Emergent marsh and riparian scrub may provide primary nesting habitat. Modesto song sparrows breed from mid-March to early August (Gardali 2008).

Modesto song sparrows may nest in the extensive riparian habitat throughout the Project Area. The nearest recorded occurrence of nesting Modesto song sparrow is less than 600 ft from the Project Area, along Steamboat Slough near the Hidden Harbor Marina on Ryer Island in 2009 (CDFW 2018c). Several nest sites were documented on Grand Island, within 0.5 miles of the Project Area (CDFW 2018c).

Swainson's hawk. Swainson's hawk, a migratory raptor that is a spring and summer resident in California's Central Valley, is state-listed as threatened. Swainson's hawk nests in only a few species of trees, such as oaks, cottonwoods, sycamores, or willows (CDFG 1994) near large, sparsely vegetated flatlands characterized by valleys, plateaus, broad floodplains, and large open expanses (Bloom 1980). Although Swainson's hawk is not an obligate riparian species, the availability of nesting trees is closely tied to riparian areas, usually associated with main river channels (Bloom 1980, Estep 1989). Nesting sites tend to be adjacent or close to suitable foraging grounds, which may include recently harvested alfalfa, wheat, or hay crops; low-growing crops,

such as beets or tomatoes; open pasture; non-flooded rice fields; or post-harvest cereal grain crops (Bloom 1980; CDFG 1994). Swainson's hawks forage in open areas with low vegetative cover that provides good visibility of prey, such as voles (*Microtus californicus*), ground squirrels (*Spermophilus beecheyi*), pocket gophers (*Thomomys bottae*), and deer mice (*Peromyscus* spp.); they avoid foraging in fields with tall crops that grow much higher than native grasses, which makes prey more difficult to find (CDFG 1994). Migrating Swainson's hawks first arrive in the Central Valley in mid-March through May and migrate south in September and October (Zeiner et al. 1990a). Breeding occurs from late March to late August, with peak activity from late May through July (Zeiner et al. 1990a). Most clutches are completed by mid-April, with fledging occurring from July to mid-August (Estep 1989).

Swainson's hawks may nest in large trees in the extensive and high-quality riparian habitat in the Project Area, and nearby agricultural lands may provide suitable foraging habitat. The nearest documented occurrence of Swainson's hawk nesting is less than one mile to the southwest of the Project Area along the northwest tip of Brannan Island in 2009 (CDFW 2018c). Furthermore, several nest sites were found on Grand Island within 3 miles of the Project Area, in riparian trees along Steamboat Slough and the Sacramento River (CDFW 2018c).

White-tailed kite. White-tailed kite is a CDFW Fully Protected species. White-tailed kite is a resident (breeding and wintering) species throughout central and coastal California, up to the western edge of the foothills of the Sierra Nevada; California constitutes the stronghold of its North American breeding range (Zeiner et al. 1990a). They are not migratory but may make slight seasonal range shifts in coastal areas during winter (Zeiner et al. 1990a). White-tailed kites breed in lowland grasslands, oak woodlands or savannah, and wetlands with open areas. Riparian corridors represent a preferred landscape characteristic for kites in both the breeding and non-breeding seasons (Erichsen 1995). Groves of trees are required for perching and nesting, though kites do not seem to associate with particular tree species (Dunk 1995). Preferred foraging sites include open and ungrazed grasslands, agricultural fields, wetlands, and meadows that support large populations of small mammals. The white-tailed kite's year-round diet consists almost entirely of small mammals (Erichsen 1995), but can also include birds, insects, and reptiles. White-tailed kites breed between February and October, with peak breeding in May through August (Zeiner et al. 1990a).

White-tailed kites may nest in large trees in the extensive and high-quality riparian habitat in the Project Area. The nearest documented occurrence to the Project Area is approximately 0.25 miles to the northwest at the Hidden Harbor Marina on Ryer Island in 2018 (eBird 2019), and the next closest occurrence is approximately 0.75 mile to the west of the Project Area (eBird 2019). There is suitable foraging habitat in open cultivated fields throughout the interior of the island.

Other migratory birds and nesting raptors. Non-listed migratory birds or raptors could establish nests in the extensive and high-quality riparian habitat in the Project Area. The nesting season for migratory birds and raptors is generally between February 15 and August 31.

Western red bat. Western red bat is a CDFW Species of Special Concern. This species roosts non-colonially, in dense canopies and within tree foliage, beneath overhanging leaves (Constantine 1959, Shump and Shump 1982), from 1–12 m (2 to 40 ft) above ground level (Zeiner et al. 1990b). Roosts have often been observed in edge habitats—near streams, fields, orchards, or urban areas (Zeiner et al. 1990b). Studies in the Central Valley found more abundant populations in remnant riparian forests with large trees than in younger, less-extensive stands (Pierson et al. 2000). Individuals may forage up to 0.3–0.6 mile from their day roosts (Zeiner et al. 1990b), both at canopy height and low over the ground (Shump and Shump 1982). This species feeds primarily

on small moths, but its diet may include a variety of other insects, such as crickets, beetles, and cicadas (Zeiner et al. 1990b). Mating occurs in August and September. Breeding females are found in association with the same cover requirements as for roost sites, and within cottonwood/ sycamore riparian habitats along large river drainages in the Central Valley (Zeiner et al. 1990b, Pierson and Rainey 2003). Fertilization is delayed until March or April. After an 80- to 90-day gestation period, pups are born from late May through early July.

Western red bat may roost in the extensive riparian forest in the Project Area, particularly in trees with habitat features such as limbs with cavities, crevices, or deep bark fissures. While the nearest recorded occurrence to the Project Area is on Grand Island approximately 5.5 miles to the northeast of the Project Area from 1999 (CDFW 2018c), this is not indicative of abundance as few bat surveys have been conducted in the Delta.

2.4.2 Findings

a) Would the Project 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 CDFW or USFWS?

Plants and natural communities

One special-status plant species population was found within the Project Area—seven patches of Suisun Marsh aster. Documented occurrences of special-status plants that are within or adjacent to Project work areas could potentially be damaged or destroyed by Project activities. Measure **BIO-1** includes training construction personnel on the presence of and avoidance measures for special-status plants, and measure **BIO-2** includes having a qualified biologist present to monitor construction activities that have the potential to adversely affect sensitive resources, including plants. Per measure **BIO-3**, a targeted pre-construction special-status plant survey will be conducted and any special-status plants within the Project Area that could potentially be damaged or destroyed by Project activities will be staked, fenced, and/or flagged for avoidance prior to construction. If avoidance is not possible, seeds will be collected, and plants will be salvaged and transplanted in consultation with CDFW as described in **BIO-3**. With the conservation measures incorporated, there will be less than significant effects on special-status plants.

Fish

Due to their life history timing, the following species and life stages may be present in the Project Area during in-water work (Section 2.4.1.4, Table 2-8):

- Sacramento River winter-run Chinook, juvenile
- Central Valley Spring-run Chinook salmon ESU, adult or juvenile
- Central Valley steelhead, adult and juvenile
- North American green sturgeon sDPS, juvenile
- Delta smelt, juvenile

Potential direct and indirect effects on special-status fish species are discussed below.

Direct effects that could occur during implementation of the proposed action, or close to the time of the action itself, include:

- Direct disturbance (e.g., displacement from preferred habitat, cover, or feeding locations)
- Increased turbidity and suspended sediment
- Hazardous materials spills from construction equipment

These direct effects could occur during placement of the rock slope protection, rock containment berm, and planting berm fill material as described in Section 1.3, Project Description.

Indirect effects that could occur later in time than construction-related effects during Project implementation include:

- Temporary loss of SRA habitat
- Habitat alteration from added rock

Direct disturbance. Fish that may be present during the proposed in-water work period have the potential to be directly disturbed (e.g., displaced from preferred habitat, cover, or feeding locations) by Project activities, including placement of rock and/or planting berm fill. Special-status fish species and life stages potentially present during imported fill placement include adult Central Valley spring-run ESU Chinook salmon, adult and juvenile Central Valley DPS steelhead, juvenile green sturgeon sDPS, and juvenile delta smelt. While the potential timing of adult Central Valley spring-run Chinook salmon and Central Valley steelhead overlaps with a portion of this in-water work period, the occurrence of these salmonids is expected to be very low because this timeframe coincides with the either the beginning or the end of the migration period, and migrating adult salmonids are expected to use deeper water habitat than what is available in the Project Area. Furthermore, because in-water work will occur during low tide when aquatic habitat in the Project Area is less suitable due to lack of submerged vegetation and associated cover, it is unlikely that listed or candidate fish species will be present in the rock berm and planting berm fill locations.

Rock and planting berm fill placement activities will occur during low tide to reduce the wetted area impacted during fill placement and to reduce the amount of suitable habitat in the Project Area available to fish. Although occurrence of these fish species within the rock and planting berm fill placement areas is unlikely, immediate or delayed death or injury of adult Central Valley Spring-Run Chinook salmon, adult, and juvenile Central Valley steelhead, juvenile green sturgeon, or juvenile delta smelt could occur from direct impacts (e.g., being crushed from placement of rocks). Any individual fish occurring within this area during low tide would, at a minimum, be temporarily disturbed and likely displaced from the affected area. These fish species are sufficiently mobile to move out of the area during Project activities, and suitable habitat for these species is greatly reduced during low tide when rock placement activities will occur. However, a small number of these fish may remain inside the rock berm placement area, where they would be subject to stress and possibly injury or mortality. If any, the number of fish affected would likely be very low, resulting in insignificant effects on the abundance, productivity, spatial structure, or diversity of listed or candidate species.

To reduce the potential risk of direct disturbance to listed fish species, rock fill will be placed during low tide as described above. In addition, conservation measures **BIO-1** (worker environmental awareness training for contractors and equipment operators**)**, **BIO-2** (biological monitoring during in-water work), and **BIO-4** (August 1 through September 30 in-water work

window) will be implemented. With the conservation measures incorporated, there will be less than significant effects on special-status fish species from direct disturbance.

Increased turbidity and suspended sediment. Turbidity, and the concentration of total suspended solids (TSS), are likely to temporarily increase during placement of the rock containment berm and planting berm fill. Turbidity and increased TSS may affect special-status fish species directly by causing adverse physiological effects. Potential turbidity and TSS increases should be minimized by conducting rock and soil placement activities during low tide. The rock containment berm will be placed prior to the soil fill in order to control sediment movement into aquatic habitat; the rock containment berm will therefore act as a sediment curtain or boom, largely confining turbidity and TSS within the rock containment berm. Despite these measures, some temporary increases in turbidity and TSS may occur immediately outside of the rock containment berm in Steamboat Slough. Given the tidal action and moderate flow, turbid water is will likely be confined to a small area, not expected to extend to an area greater than a maximum of 50 ft from the in-water work zone. Any fish using areas outside the rock containment berm should be able to easily move out of the turbidity plume given the unconfined nature of the waters in and around the Project Area.

Migratory life stages of Chinook salmon and steelhead, green sturgeon, as well as rearing Chinook salmon, steelhead, green sturgeon, and delta smelt are sufficiently mobile to avoid areas of high turbidity and TSS caused by in-water construction activities. As a worst-case scenario, a few listed or candidate juvenile fish may remain along the edges of the rock fill berm and will be exposed to temporary increases in turbidity and TSS. Given that Chinook salmon, steelhead, green sturgeon, and delta smelt evolved in highly variable systems, including occasionally very high turbidity and TSS, it is unlikely that any fish using this area would experience direct adverse effects (i.e., physiological impairment) due to elevated turbidity and TSS during rock placement activities.

Project conservation measure **BIO-5** includes having a qualified biologist conduct water quality monitoring for turbidity, as a surrogate for TSS, in Steamboat Slough during installation of the containment berm and placement of planting fill (Section 1.4). If turbidity levels exceed applicable water quality objectives, either fill placement activities will be delayed until lower tide levels occur. In addition, Project conservation measure **HYD-1** includes BMPs to avoid and/or minimize potential impacts from erosion, including working during dry periods and incorporating appropriate erosion control measures. With the conservation measures incorporated, there will be less than significant effects on special-status fish species from temporary increases in turbidity and TSS.

Hazardous materials spills from construction equipment. Releases of diesel fuel, lubricants, hydraulic fluid, and other potential contaminants from construction equipment could potentially result in acute adverse impacts to fish directly via physiological impairment, the interruption of essential behaviors, or direct mortality. Hazardous spills may also impact invertebrates, and critical habitat. The proposed action will adhere to strict conservation measures regarding oil and fuel spills and will ensure that all personnel are aware of spill prevention and response procedures.

To address risks to listed species related to chemical and other hazardous spills, conservation measures **HAZ-1** and **HAZ-2** will be implemented (Section 1.4). These include appropriate construction BMPs to avoid and minimize potential effects from hazards and hazardous materials, and measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the Project. Following implementation of the

conservation measures above, any potential leaks or spills of oil or other fluids from construction machinery would likely be small in volume and short in duration and would therefore contaminate only a small area. Proper execution of these plans and consistent implementation of construction BMPs will ensure that any spills which do occur are immediately and effectively remediated. With the conservation measures incorporated to prevent and manage for spills, there will be less than significant effects on special-status fish species.

Temporary loss of SRA habitat. The Project design incorporates establishing a waterside berm, planted with native species, to restore riparian habitat temporarily disturbed during levee repair. Creating the waterside planting berm approximately 20 ft into the channel from the base of the existing levee toe may temporarily increase the distance of the water's edge from riparian habitat, temporarily decreasing the amount of available SRA along Steamboat Slough. SRA cover provides shelter, resting, rearing, and feeding areas to multiple fish species. The temporary loss of SRA cover can also negatively impact anadromous fish by removing protective cover for juveniles. Loss of SRA will be temporary and will affect a small amount of available SRA habitat compared to the total amount of SRA available along Steamboat Slough and adjacent Project waterways. Listed fish species seeking cover in SRA habitat could find suitable SRA habitat nearby.

The elevation of the rock containment berm has specifically been designed to allow periodic inundation of the planting berm during high tides, allowing the planting berm to act as a floodplain-like bench which in turn provides suitable habitat for juvenile fish. Inundation of the planting berm will provide SRA along the channel margin, and after vegetation becomes established within the planting berm, high quality fish habitat will become available in submerged vegetation during high tide.

Overall, the Project is designed for no long-term net loss of nearshore shade and cover. Construction of the Project will also help ensure long-term stability of SRA habitat, as it will help prevent levee failure that could result in long-term SRA habitat losses. To address the temporary loss of SRA, the Project has been designed to allow periodic inundation of the planting berm during high tide to create fish habitat in a floodplain-like bench. Planting vegetation (e.g., willow stakes, tules) in the planting berm will also provide high quality fish habitat when the vegetation becomes established and then submerged during high tide. The slope of the planting berm will replicate the slope of the existing beach, allowing the berm to drain and creating some variability in inundation frequency which should encourage a variety of plant species to establish.

New vegetation within the planting berm will require time to establish and mature. Although six large trees will be removed, other large trees will remain in the Project Area. Overall, vegetation clearing and tree removal is expected to reduce SRA until new plantings become established and begin to mature and existing trees continue grow enough to fill in areas opened from clearing and tree removal. The level of re-planting used for this Project is expected to return SRA cover on-site and restore habitat conditions for fish to pre-Project levels within a few years. Effects on special-status fish species from temporary loss of SRA habitat will therefore be less than significant.

Habitat alteration from added rock. Once the levee has been repaired, potential construction-related disturbances to listed and candidate species will cease. The rock containment berm will be placed at a level that allows periodic inundation of the planting berm, allowing fish access to high quality aquatic habitat and SRA during high tides. However, as a result of this Project, new rock substrate will be added to the channel.

Channel substrate in the Project Area is predominantly sand, with riprap bank in some locations, that both become inundated at high tide. Under the Project, rock substrate will be placed within the channel to build the rock containment berm, which will be inundated more frequently than the current bank riprap. Rock substrate may provide habitat for juvenile salmonids as well as non-native predators. Sand substrate along the channel margins may provide suitable egg deposition habitat for delta smelt. Overall, the addition of rock substrate in the channel is not likely to adversely affect listed fish species in the Project Area in the long term since sand substrate will be maintained within the planting berm via natural deposition and be unaffected outside the rock containment berm. Furthermore, the floodplain-like planting berm will provide high quality habitat for juvenile salmonids when inundated. Effects on special-status fish species will therefore be less than significant.

Wildlife

Valley elderberry longhorn beetle. Direct impacts on elderberry longhorn beetle habitat would involve the loss (e.g., removal) or damage (e.g., disturbance to roots or limbs) of occupied or suitable elderberry shrubs because of vegetation removal. There will be no direct Project-related effects on valley elderberry longhorn beetle because the blue elderberry plants are located outside of the Project Area and will not be removed or trimmed.

Construction activities have the potential to indirectly affect valley elderberry longhorn beetle habitat during construction activities from production of dust, though studies show that the effects of dust adjacent to host plants or beetles are not significant threats to the species or its habitat (Talley et al. 2006). Water trucks will be used to minimize dust, and vibration and noise is not expected to be close enough to elderberry shrubs to affect beetles, if present.

Implementation of **BIO-1** includes training construction personnel with regards to the ecological values of the site, including training crews about the ecological importance of elderberry shrubs and completely avoiding any direct impacts on the plant (Section 1.4). Furthermore, the Project construction schedule is limited to August 1 through October 31; this timeframe is outside of the valley elderberry longhorn beetle flight season (March to July [USFWS 2017]), further minimizing the potential for effects on the species to less than significant.

Western pond turtle. Western pond turtles can be directly injured or killed by Project vehicles or construction equipment. While there is no documented evidence that western pond turtles are particularly sensitive to increases in turbidity, temporary increases in turbidity and TSS during placement of the rock containment berm and planting berm fill may reduce foraging efficiency and ability to avoid predators. Potential turbidity increases will be minimized by conducting rock and soil placement activities during low tide. The rock containment berm will be placed prior to the soil fill in order to control sediment movement into aquatic habitat; the rock containment berm will therefore act as a sediment curtain or boom, confining turbidity within the rock containment berm. Given the tidal action and moderate flow, turbid water is will likely be confined to a small area, not expected to extend to an area greater than a maximum of 50 ft from the in-water work zone. Any turtles using areas outside the rock containment berm should be able to easily move out of the turbidity plume given the unconfined nature of the waters in and around the Project Area. Turtles in harm's way will be allowed to move from the construction area on their own.

The following measures to be incorporated in the Project will reduce the potential for impacts on western pond turtle: Measure **BIO-1** (training construction personnel with regards to the ecological values of the site, including western pond turtles), **BIO-2** (having a qualified monitor present during in-water work, excavation, or filling), and **BIO-5** (having a biologist present to

monitor for water quality during installation of the containment berm). Furthermore, measure **BIO-6** includes pre-construction surveys for western pond turtle prior to the initiation of construction. Impacts on western pond turtle will therefore be less than significant with conservation measures incorporated.

Nesting birds and raptors. There may be Project-related effects on migratory nesting birds and raptors (including white-tailed kite, Swainson's hawk, and Modesto song sparrow) if disturbance occurs to or near an active nest site during the breeding season. Direct impacts may occur as a result of removing or trimming of trees or other that plants/structures that provide nesting habitat. Indirect impacts may occur from construction noise (for example, from heavy equipment, vehicles, generators, and human presence) or vibration, which could lead to nest abandonment or premature fledging. Implementation of measures **BIO-1** (training construction personnel with regards to the ecological values of the site, including the potential for nesting birds), **BIO-7** (conducting a preconstruction nesting birds survey and implementing appropriate buffers), and **BIO-8** (preconstruction surveys for nesting Swainson's hawk and implementing appropriate buffers) will reduce potential impacts to less than significant.

White-tailed kite, Swainson's hawk, and Modesto song sparrow may forage in or near the Project Area during construction. Foraging birds can easily disperse away from temporary Project construction noise and vibration; therefore, Project-related adverse effects on these bird species are not anticipated.

Western red bat. There may be Project-related effects on western red bad if the disturbance occurs to or near active roost sites. Direct impacts may occur as a result of removing or trimming suitable trees while roosting bats are present. Indirect impacts may occur from construction noise or vibration. Measure **BIO-6** will be implemented to ensure that western red bats are not adversely affected by the Project.

Removal of six trees would not represent a significant loss of bat roosting habitat, however removal could impact a few individual bats if roosting at the time the tree is removed. **BIO-6** involves removing trees via a two-step process over two consecutive days outside of the western red maternity or winter torpor season. Limbs and branches would be removed on the first day using chainsaws to create noise and disturbance. Limbs with cavities, crevices, exfoliating bark, or deep bark fissures would be avoided, and only branches or limbs without those features would be removed. This action would allow bats to leave during the night after the first day of the two-step removal process, thus increasing their chances of finding new roosts with a minimum of potential predation during daylight hours. The tree would then be removed the second day. The activity, noise, and vibrations of the chainsaw as well as the physical and visual change of the tree would deter bats from returning to the tree after their nightly flight. In addition, implementation of **BIO-1** includes training construction personnel in the ecological value of the site, including tree-roosting bats, and steps to take to avoid or minimize impacts. Therefore, impacts on western red bat will be less than significant with conservation measures incorporated.

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

In accordance with the requirements of Assembly Bill 360 and DWR's Delta Flood Protection Program requirement for net long-term aquatic habitat improvement, this discussion is focused on potential impacts on riparian forest and scrub-shrub habitat; potential effects on SRA habitats are

described above in the fish impact discussion under item (a). Freshwater marsh is not included, as there is none in the Project Area.

Site preparation activities include clearing ruderal weeds and non-native annual plants. Approximately six large trees will need to be removed for safety reasons. Other trees may need to be limbed, and smaller trees cleared to facilitate equipment access. Ground cover will be cleared prior to placing rock. These activities may temporarily impact up to the approximately 0.62 acres of riparian forest in the Project Area, and 0.07 acres of scrub-shrub habitat.

The Project design incorporates a waterside berm, planted with native species, to restore riparian habitat temporarily disturbed during levee repair. Loss of riparian habitat will be temporary and will affect a small amount of available riparian habitat compared to the total amount available along the Project Area, the southwestern tip of Grand Island, and around adjacent Project waterways. Furthermore, construction of the Project will help ensure long-term stability of riparian habitat, as it will help prevent levee failure that could result in long-term riparian habitat losses. The level of re-planting used for this Project is expected to return riparian cover on-site pre-Project levels within a few years. Potential effects on riparian habitat or other sensitive natural communities will therefore be less than significant.

c) Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The Project does not include the removal or filling of wetlands.

The Project will reestablish the authorized waterside levee slope geometry by replacing the bank and associated function that was part of the original federal levee. The Project has been designed to mitigate for potential environmental effects by incorporating a planting berm into the repair design to mitigate for vegetation loss, in turn also mitigating for potential impacts to SRA habitat for special-status fish. Furthermore, the Project includes limiting the amount of fill in waters of the U.S. to the minimum necessary to reestablish the bank that had historically been present but previously eroded into Steamboat Slough, while concurrently providing suitable high-quality fish habitat. This impact is therefore less than significant.

d) Would the Project 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?

The Project will not interfere substantially with the movement of any native resident fish or wildlife species, nor impede the use of any wildlife nursery sites (see above for discussion of nesting raptors and migratory birds). The Project includes modifications to existing levee infrastructure and will not include construction of any elements that will substantially block native resident fish or wildlife movement. Any individual fish occurring within the Project Area during rock and planting berm fill placement activities during low tide are sufficiently mobile to move out of the area during Project activities, having access to other nearby aquatic habitat. Potential impacts will therefore be less than significant.

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

The Project will not conflict with any local policies or ordinances protecting biological resources, including compliance with the Sacramento County Tree Preservation and Protection Ordinance regarding heritage or landmark trees (Section 6.3); there will be no impact.

f) Would the Project 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 Habitat Conservation Plans or Natural Community Conservation Plans include the Project Area. There will be no impact.

2.5 Cultural Resources

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	❑	❑	❑	✓
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	❑	❑	❑	✓
c) Disturb any human remains, including those interred outside of formal cemeteries?	❑	❑	❑	✓

2.5.1 Environmental setting

The Sacramento-San Joaquin River Delta is a large inland river delta consisting of a network of shallow channels and marshy islands at the confluence of the Sacramento and San Joaquin Rivers (Pierce 1988). It began forming toward the end of the Pleistocene, as rising sea levels and associated slowing of river currents caused wetlands to expand and river sediments to accumulate in this region. Over the next several thousand years, sediment continued to accumulate creating thick deposits of peat, sand, and silt in many areas of the Delta, creating natural levees. However, until the mid-nineteenth century, settlement in the area was limited because of the shortage of solid ground and constantly shifting banks of sand and organic material, though there is evidence that Native American groups have been occupying this area for thousands of years.

Grand Island is in the Sacramento-San Joaquin River Delta region, immediately north of Isleton between Steamboat Slough and the Sacramento River, at an elevation ranging from -15 ft to 10 ft above sea level. The island itself is primarily agricultural land dotted with fields and small farms, with an earthen levee surrounding the perimeter on which the primary road is located accompanied by a series of subsidiary roads and drainage ditches crisscrossing the interior. The Project Area of Potential Effect (APE), as defined by Section 106 of the National Historic Preservation Act (NHPA), is located on the western edge of the island, including a portion of the

levee and a cluster of adjacent farm buildings. The soils within the APE are characterized as xeropsamments, soils consisting primarily of unconsolidated sand deposits with no distinct soil horizons and are not suitable for agriculture (USDA 2018).

Albion Environmental, Inc.'s (Albion's) Phase I archaeological investigations for the Project comprised background historical research, a records search (of known cultural resources within 1/2-mile of the APE as well as Native American consultation), and a field reconnaissance survey of the APE that included limited subsurface testing.

Pre-contact historic context, ethnographic context, and post-contact historic context of the region are detailed in the archaeological investigations report (Albion 2018).

2.5.1.1 Record search

Albion conducted background research including a records search at the North Central Information Center (NCIC) of the California Historical Resources Information System, and initiated consultation with the Native American Heritage Commission (NAHC) and local Native American tribes.

2.5.1.2 North Central Information Center

The following sources were consulted as part of the NCIC records search:

- the California Inventory of Historic Resources, managed by the State of California Department of Parks and Recreation, and
- the Historic Property Data File for Sacramento County, managed by the State Office of Historic Preservation (including the California Register, California Historic Landmarks, and California Points of Historical Interest).

A search of records at NCIC indicates that one prior survey has been conducted within the Project APE and four have been conducted within a half-mile radius. The prior survey within the APE was conducted in 1976 as part of the Sacramento Deep Water Ship Channel Project from Collinsville to Sacramento but identified no cultural resources within the portion of the survey extending within the APE (Seldomridge and Smith-Madsen 1976).

NCIC has no records for any cultural resources within the Project APE but one resource was identified within a half-mile radius. This resource (P-34-4451) is an unknown underwater feature approximately 60 ft long in Steamboat Slough, identified in 2009 using side scan sonar (Panamerican Consultants 2009).

2.5.1.3 Native American consultation

Albion initiated Native American outreach to solicit information about potential Tribal resources in or near the Project APE and the treatment of those resources. Resources of interest might include archaeological deposits, traditionally important plants, or locales that have been or are currently used for Tribal activities. The NAHC indicated that there are sacred sites in or near the APE and forwarded the names of ten tribal representatives to contact for details. Albion contacted each of these by letter, describing the Project and asking for information or comments. Albion followed the letters with emails and phone calls. Eight of the representatives did not respond, while the Maidu Tribe replied and had no comment on the Project and the Mi-Wuk Tribe replied that they have no record of any cultural resources within the vicinity of the Project Area.

2.5.1.4 Field survey

On May 7, 2018, Albion archaeologists conducted a surface reconnaissance survey of the entire APE and limited subsurface testing of portions of the APE. The reconnaissance survey involved walking the APE at 5-meter intervals or less to observe the surface for evidence of archaeological materials, documented by written notes and photos. Notes documented details on disturbances, slope, ground cover, soil visibility, vegetation, the built environment, and any cultural material observed. Three shovel probes (SPs) were excavated inside the APE, each in 20-cm levels, with all soil dry-screened through 1/8-inch wire mesh and any cultural material observed but not collected. All three were located on the levee slope adjacent to the road, one on the landside slope and two on the waterside slope. SPs are hand-excavated units measuring approximately 40-cm in diameter by 60 cm in depth that provide a window into the soil conditions and any buried cultural material not visible on the surface. A detailed methodology is provided in the archaeological investigations report (Albion 2018).

Based on surface survey and limited subsurface testing of the Project APE, Albion identified no cultural materials indicative of intact subsurface archaeological deposits that would qualify as historic properties under Section 106 of the National Historic Preservation Act (NHPA).

2.5.1.5 Summary

Background research suggests that Grand Island was home to one or more Miwok tribelets by the early 19th century, but historic records suggest that the general vicinity of the APE was not contained within the levee system and under cultivation until the 1870s or 1880s. No information on specific locations of human settlement within the APE are available for this time period and it is not until the early 20th century that there is clear visual evidence of the locations of farms and levees on this part of the island. The modern levee system was in place by the 1890s and by the 1930s the existing cultural landscape was largely in place. Aerial photography from the 1930s shows no farms in or adjacent to the Project APE, and the same is true today. Consequently, there is a very low potential for encountering remains of historic period farms within the APE. Furthermore, the shoreline where the levee is now would have been low-lying and marshy prior to the levee's construction and the potential for buried deposits associated with precolonial and historic period Miwok occupation of the island is also very low.

2.5.2 Findings

a) Would the Project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

No historical resources were identified in the APE (Albion 2018). Therefore, the Project will not cause a substantial adverse change in the significance of a historical resource as defined in §15064.5, and the Project will have no impact on historical resources.

b) Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

There are no historical properties in the portions of the APE subject to subsurface impacts. The levee itself is well-documented historically, and no further information could be gleaned from additional archaeological study. It is unlikely that archaeological deposits exist in the APE because it would have been underwater or marshland prior to construction of the levee system. Also, since work on the levee crest and landside slope will be restricted to staging of construction

equipment and materials, subsurface impacts in these locations will be negligible. The Project will not cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5, and the Project will have no impact on archaeological resources.

c) Would the Project disturb any human remains, including those interred outside of formal cemeteries?

There is extremely low potential for encountering undocumented human remains during the Project. Historical documents and results of the record search do not indicate any human burials within the Project Area, and no human remains were encountered during the surface reconnaissance. Should human remains be encountered during excavation, work within the immediate area will be halted and the Sacramento County Coroner will be notified immediately. If the remains are determined to be Native American, then the NAHC will be notified within 24 hours as required by Public Resources Code 5097. The NAHC will notify the designated Most Likely Descendant who will provide recommendations for the treatment of the remains within 48 hours of being granted access to the site.

2.6 Energy

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	❑	❑	✓	❑
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	❑	❑	❑	✓

2.6.1 Environmental setting

2.6.2 Findings – Proposed Action

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Project construction will require fossil fuels, a nonrenewable resource, to power construction vehicles and equipment. The use of such equipment is necessary to repair the levee effectively and safely. Construction equipment will be used as efficiently as feasible. The impact will be therefore be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The Project will not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. There will be no impact.

2.7 Geology and Soils

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Directly or indirectly cause 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?	❑	❑	❑	✓
ii) Strong seismic ground shaking?	❑	❑	❑	✓
iii) Seismic-related ground failure, including liquefaction?	❑	❑	❑	✓
iv) Landslides?	❑	❑	❑	✓
b) Result in substantial soil erosion or the loss of topsoil?	❑	❑	✓	❑
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?	❑	❑	❑	✓
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	❑	❑	✓	❑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	❑	❑	❑	✓
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	❑	❑	❑	✓

2.7.1 Environmental setting

Grand Island is composed predominately of marsh muds and peats that accumulated throughout the Holocene (present day to approximately 11,000 years before present) (Atwater 1982, Helley and Graymer 1997). This process of tidal marshland formation, principally overlying older sand and eolian deposits from the Pleistocene-age Modesto Formation, occurred throughout the Delta region until land reclamation began in the late 1800s during Euro-American settlement (Whipple et al. 2012). Reclamation entailed levee construction around the Delta islands to facilitate agricultural practices absent of annual flooding that once supported the marsh setting. Oxidation of the drying peat soils has led to its depletion and, thus, subsidence of the Delta islands, including Grand Island.

The Project Area lies within the Great Valley geomorphic province that is crossed by few faults, but is bordered to the west by the Coast Range province which hosts several active right-lateral, strike-slip faults. The Hayward Fault Zone lies about 40 miles to the southwest of the Project Area. The closest "active" faults[5] designated by the California Geological Survey (CGS) are the Greenville Fault Zone and Green Valley-Concord fault zones, located about 25 miles to the southwest and 26 miles to the west, respectively. The closest potentially active fault is the Midland Fault Zone running north-south through the Delta and across the southwestern edge of Grand Island, approximately 0.5 miles from the Project Area. (Unruh and Hitchcock 2009, CGS 2010). The most recent displacement along this fault is estimated by the CGS (2010) to be mid- to early-Quaternary (0.7–2.6 million years before present).

The Greenville and Green Valley-Concord faults have estimated slip rates of 1–3 and 2–8 mm/yr, respectively (USGS 1999), and the USGS estimates a 16% probability of the faults experiencing an earthquake of magnitude 6.7 or greater by the year 2043 (Aagaard et al. 2016). The Hayward fault exhibits spatially variable slip rates, ranging from a low of 3-4 mm/yr to a high of 4-6 mm/yr; average slip rate for the Hayward Fault is calculated to be 4.6 mm/yr (Lienkaemper et al. 2012). The 30-yr probability of future large events of the Hayward Fault is calculated to be ~29% (±6%), based on a 1900-yr earthquake chronology (Lienkaemper et al. 2010). Peak ground motion[6] estimated by the CGS in the Project Area is assigned a moderately low value of 0.3 for alluvial materials (CGS 2016). Sacramento County as a whole is not affected by ground-rupture hazards. Delta islands may be susceptible to liquefaction due to shallow groundwater depths and presence of sandy-peaty soils having low cohesive strength. A liquefaction hazard assessment on nearby Bouldin Island, approximately 10 miles south-southeast of Grand Island, gauged Quaternary alluvial sediments as being susceptible to liquefaction under saturated conditions (CGS 2018). However, Grand Island is not mapped as a liquefaction hazard zone (Cal OES 2015). These lands are also susceptible to levee damage caused by seismically induced waves in the Delta channels (USGS 2000).

2.7.2 Findings

a) Would the Project directly or indirectly cause 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?

The Project is not located within an Alquist Priolo Earthquake Fault Zone. The Green Valley fault is the nearest delineated Alquist-Priolo zoned fault and is located 30 miles to the west of the Project Area. This fault is considered historically active (i.e., active within the last 15 thousand years) and is noted to exhibit between 1.0 and 5.0 mm/yr of right lateral offset (Bryant and Cluett 2002). The Project levee rehabilitation will result in no operational or land use change that will alter the people or structures exposed to potential rupture of an earthquake fault. There will be no impact.

[5] An "active fault" is defined by the California Geological Survey as a fault having surface displacement within the Holocene epoch, or the past 11,000 years (CGS 2018).
[6] Peak ground motion (10% probability of being exceeded in 50 years) is expressed as a percent of the acceleration due to gravity.

ii) Strong seismic ground shaking?

The Project Area is not located near active faults and, accordingly, lies in a zone with a low potential for strong seismic ground shaking. The Project levee rehabilitation will result in no operational or land use change that will alter the people or structures exposed to strong seismic ground shaking. There will be no impact.

iii) Seismic-related ground failure, including liquefaction?

The Project Area lies in the Delta, which is potentially susceptible to seismically induced liquefaction that could cause the earthen levee-integrity to fail, thereby breaching the levees and flooding the island. The Project is being done specifically to minimize this risk by addressing bank loss, waterside slope instability, and erosion. In addition, the Project levee rehabilitation will result in no operational or land use change that will alter the people or structures exposed to seismic-related ground failure. There will be no impact.

iv) Landslides?

The Project Area has a flat topography, except for the levees surrounding the island, which are designed with slopes that are not conducive to sliding. Accordingly, the Project Area is not susceptible to landslides. The Project levee rehabilitation will result in no operational or land use change that will alter the people or structures exposed to landslides. There will be no impact.

b) Would the Project result in substantial soil erosion or the loss of topsoil?

In the short-term and mostly during active construction, there is potential for stormwater-related erosion of surficial soil from the levee slopes. However, Project activities will be limited to waterside work and will not significantly alter the stability of soils on the levee. The levee is made of fill, and there is only minimal topsoil present. In the long-term, Project measures will stabilize the levee slope, which has been designed to have a stable gradient. Effects of the Project on soil erosion and loss of topsoil will be less than significant.

c) Would the Project 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?

The existing earthen levees surrounding Grand Island overlie potentially unstable geologic units composed of peat and silty-clayey loams. The Project includes adding rock slope protection and a rock containment berm. Overall, levee rehabilitation will substantially improve the stability of the levee; the Project will therefore have a beneficial effect regarding unstable soils (i.e., no impact).

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

The levee areas within the Project Area are composed of expansive soils. The Project has, however, been designed to address the potential for expansive soil. Furthermore, no buildings or structures will be constructed on this section of levee. Overall, by protecting existing land uses from potential levee failure, the Project will reduce risks to life and property from expansive soil

and, therefore, potential effects from the Project being located on and/or utilizing expansive soils will be less than significant.

e) Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The Project will not include installation or disturbance to any existing septic tanks or alternative wastewater disposal systems. There will be no impact.

f) Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The Project will not destroy a unique paleontological resource or site or unique geologic feature. There will be no impact.

2.8 Greenhouse Gas Emissions

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	❑	❑	✓	❑
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	❑	❑	❑	✓

2.8.1 Environmental setting

In January 2008, California Assembly Bill 32, the Global Warming Solutions Act of 2006, went into effect. This bill required CARB to develop regulations to address global climate change due to greenhouse gas (GHG) emissions. The act also requires a statewide greenhouse gas emissions limit, equal to the 1990 level, as a limit to be achieved by 2020. The 2020 GHG emissions limit is 431 million metric tons of carbon dioxide equivalent (CO_2e). In 2016, Senate Bill 32, California Global Warming Solutions Act of 2006: Emissions Limit (SB32), further requires the state of California to reduce statewide GHG emissions to 40% below the 1990 level by the year 2030 (CARB 2018).

State law defines greenhouse gases to include the following emissions: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (Health and Safety Code, section 38505(g)). The most common greenhouse gas that results from human activity is carbon dioxide, followed by methane and nitrous oxide. The SMAQMD has adopted quantitative threshold value of 1,100 metric tons per year CO_2e for greenhouse gas emissions during Project construction (SMAQMD 2018).

2.8.2 Findings

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

The construction of the Project is not expected to generate greenhouse gas emissions that would have a significant impact on the environment during construction of the Project scheduled for approximately 20 days sometime during the months of May–November 2020 or 2021. The results from the Road Construction Emissions model used for determining the significance of Project-related air quality effects shown in Section 2.3 (Air Quality) predict a total of 73.1 metric tons of CO_2e during construction of the Project, which is well below the 1,100 metric tons per year of CO_2e that has been proposed as a standard for project construction by SMAQMD. Therefore, impacts regarding the generation of greenhouse gas emissions are expected to be less than significant.

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

The construction of the Project will not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases, as it will not change land use or transportation infrastructure. Therefore, the Project will have no impact.

2.9 Hazards and Hazardous Materials

Issues	Potentially significant impact	Less than significant with mitigation incorporated	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?	❑	✓	❑	❑
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?	❑	✓	❑	❑
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	❑	❑	❑	✓
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?	❑	❑	❑	✓
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 or excessive noise for people residing or working in the Project Area?	❑	❑	❑	✓
f) Impair implementation of or physically interfere	❑	❑	❑	✓

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
with an adopted emergency response plan or emergency evacuation plan?				
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	❑	❑	❑	✓

2.9.1 Environmental setting

Land uses surrounding the Project Area are predominantly agricultural and open space, along with some residential uses. These lands have the potential to contain hazardous substances. Petroleum products and pesticides are the most likely materials that may have been stored or released into the surrounding environment. Older gas wells and underground storage tanks used to store petroleum products and other hazardous materials may develop leaks. These leaks can lead to the contamination of soils and groundwater. A query of the California Department of Toxic Substances Control's (CDTSC's) database reveals that there are no known sites in the Project Area having cleanup, permitted, or other hazardous materials status (CDTSC 2019).

The surrounding river elevation fluctuates seasonally and the groundwater elevation is assumed to fluctuate with river levels. Even during periods of low tide, it is likely that groundwater flows toward the island and that any contaminated water could be transported to the soils within and near the levees. The composition of the existing levee is unknown. In many parts of the Bay Delta non-hazardous and hazardous materials were potentially incorporated into levee construction and repair. In addition to soil, rock, and concrete, materials used for bank protection may have included other available materials such as asphalt, fiberglass, automobile bodies and tires, asbestos fiber, and metal. Therefore, the underlying materials of the existing levees may contain hazardous substances. The exact composition of the levee materials below the surface is not wholly known throughout the Project Area. Potential sources of contamination of the surface of the levees may include trash and debris from litter and illegal dumping, contaminant-laden sediment transported in the waterway and deposited on the levee, and surficial application of herbicides commonly used for weed control along the levee.

2.9.2 Findings

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

The Project has the potential to accidently spill diesel fuel and other hazardous materials used by construction equipment during the levee rehabilitation work. To minimize the risk of hazardous-materials release during construction, the Project will implement hazardous materials BMPs as outlined in **HAZ-1** and **HAZ-2** (see Section 1.4). All fuels and other hazardous materials will be handled, stored, and used according to the manufacturer's specifications. An area will be established for construction equipment staging, and petroleum products will be stored in tightly sealed containers that are clearly labeled, in a covered area, within prefabricated spill containment devices, earthen berms, or similar secondary containment features. In the event of a spill, crew personnel will stop the spillage at its source, contain the spilled material, and notify Project

supervisors and appropriate agency representatives. With incorporation of HAZ-1 and HAZ-2, impacts will be less than significant.

b) Would the Project 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?

As stated above, the Project will implement hazardous materials management BMPs as outlined in **HAZ-1** and **HAZ-2** (see Section 1.4) during construction; there will therefore be a less than significant impact with HAZ-1 and HAZ-2 incorporated.

c) Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

There are no schools located within 0.25 mile of the Project Area. The closest existing school to the Project Area is Rio Vista High School, located about 3 miles to the southwest in Solano County. The Project will have no impact.

d) Would the Project 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?

The Project Area and the remainder of Grand Island are not included on a list of hazardous materials sites. The Project will have 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 or excessive noise for people residing or working in the Project Area?

There are no public-use airports within two miles of the Project Area. The closest public or public-use airport to the Project Area is Rio Vista Municipal Airport, located about 3 miles to the northwest. The Project will have no impact.

f) Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

There are no residences within the Project Area. Agricultural buildings and farm residences outside of the Project Area will continue to have the same access to roads during Project construction. The Project will not alter navigation on adjacent waterways as Steamboat Slough is approximately 500 ft wide near the Project and average barge widths do not exceed 100 ft. All roadway traffic supporting Project construction will adhere to all applicable laws for motor vehicles and with the county's Office of Emergency Services. There will be no impact.

g) Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The whole of Grand Island has been designated by the Department of Forestry and Fire Protection (CalFire) as a "Local Responsibility Area" having no "moderate" to "very high" fire hazard severity zones (CalFire 2007). Accordingly, the Project will not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. In

addition, the Project will implement **HAZ-3** (see Section 1.4) to reduce the potential for a grass fire. The Project will have no impact.

2.10 Hydrology and Water Quality

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Violate any water quality standards or waste discharge requirements?	❑	✓	❑	❑
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	❑	❑	❑	✓
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	❑	❑	✓	❑
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	❑	❑	❑	✓
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	❑	❑	✓	❑
f) Otherwise substantially degrade water quality?	❑	✓	❑	❑
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?	❑	❑	❑	✓
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	❑	❑	✓	❑
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?	❑	❑	❑	✓
j) Inundation by seiche, tsunami, or mudflow?	❑	❑	❑	✓

2.10.1 Environmental setting

Grand Island is surrounded by navigable waterways. The island is encircled by a flood control levee maintained by Reclamation District No. 3. The levee crown is 36 ft wide, with a slough side slope of approximately 25 degrees and a landside slope of approximately 17 degrees. The levee crown roadway will be graded toward the interior of the island at a cross slope of approximately

2%, routing runoff toward the landside. The levee height varies from 15–20 ft above Steamboat Slough. The interior of the island presently lies between -5 and 25 ft above mean sea level (Simons 2009).

The Delta experiences a two-season Mediterranean-type climate, with wet cool winters and dry hot summers. The Central Valley and its surrounding upland drainages receive highly variable annual rainfall punctuated by episodic large events that typically coincide with the El Niño. Mean annual rainfall at Grand Island between 1981 and 2010 was 17.3 inches (PRISM 2018). Water levels in the adjacent waterways fluctuate predominately by tidal action and episodic flood events typically in winter and spring. Bi-directional flow therefore occurs in this part of the Delta due to winter storms (riverflow directed toward the Sacramento-San Joaquin confluence to the southwest of Grand Island), tidal actions (daily fluctuations), and water-supply pumping in the south Delta (at the State Water Project intakes). Grand Island is currently mapped within FEMA's effective 100-year recurrence floodplain designation, but not their effective 500-year designation (CDWR 2019). There are no tsunami risks in the Project vicinity according to the CGS's tsunami inundation map (CGS 2019).

The majority of Delta channels including around Grand Island have been classified as impaired (Clean Water Act Section 303[d]) by the State Water Resources Control Board (SWRCB 2010). This designation is given to streams for which a standard of water quality for beneficial uses (such as drinking water and water for recreation) has not been met. The regional water body in which Steamboat Slough is located—Delta Waterways: northern portion—is classified as impaired for metals (mercury), pesticides (chlorpyrifos, DDT, diazinon, dieldrin, chlordane, group A pesticides), toxicity (unknown toxicity), PCBs (organic chlorine compound used in coolant fluids), and miscellaneous (invasive aquatic species) (SWRCB 2010).

Turbidity is determined by the cloudiness or haziness of a fluid caused by individual particles (suspended solids). Turbidity directly affects water temperature by absorbing the sun's energy, which in turn warms the water and lessens the water's ability to hold oxygen. Elevated turbidity concentrations can therefore impact aquatic habitat quality. Continuous turbidity measurements made since 2010 at the USGS river gage near Mandeville Island (south of Grand Island) recorded values ranging up to approximately 100 nephelometric turbidity units (NTU), with the highest concentrations correlated with winter storm events (USGS 2019).

2.10.2 Findings

a) Would the Project violate any water quality standards or waste discharge requirements?

Project-related ground disturbance could temporarily increase the potential for localized erosion and sediment-laden stormwater runoff. To minimize the risk of soil erosion during construction, the Project will implement **HYD-1** (see Section 1.4) to minimize potential erosion and stormwater runoff. The Project will also implement hazardous materials BMPs (**HAZ-1** and **HAZ-2**) to minimize the potential for accidental spills of hazardous materials to enter waterways. Implementation of the Project will have a less than significant impact with **HYD-1**, **HAZ-1**, and **HAZ-2** incorporated.

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

The Project will not alter existing groundwater pumping rates or natural recharge potential on Grand Island. The Project will have no impact.

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

The Project involves rehabilitation of the existing levee and will not substantially alter the existing drainage patterns or adjacent stream course (i.e., Steamboat Slough). Earth movement and rock placement will be conducted during rehabilitation work which could temporarily disturb surficial soils and alter runoff potential at low levels. The Project will have a less than significant impact.

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

The Project will not alter existing drainage patterns. The Project will therefore have no impact.

e) Would the Project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

There is no existing or planned stormwater drainage system on Grand Island. The Project will rehabilitate an existing structure and should minimize the potential for runoff relative to current conditions through the more stable levee design and soil stabilization methods. The Project will have a less than significant impact.

f) Would the Project otherwise substantially degrade water quality?

See item (a) above.

g) Would the Project 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?

The Project will not involve construction of new housing nor will it place existing structures within the 100-year floodway. The Project will have no impact.

h) Would the Project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

The Project is rehabilitating the existing levee to protect against the 100-year flood. While earth movement and rock placement on the levee will technically occur within the 100-year floodway, it will be mostly surficial in nature. Placement of the rock containment berm below MHW will marginally increase the channel roughness coefficient in the Project Area. This is unlikely to significantly impede or redirect flows. The Project will therefore have a less than significant impact.

i) Would the Project 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?

The rehabilitation of the levees along the western side of Grand Island will increase flood protection on the landside of the island. The Project will therefore have a beneficial effect concerning flooding and levee failure.

j) Would the Project result in inundation by seiche, tsunami, or mudflow?

The portion of the Bay-Delta where Grand Island is situated is not at risk from tsunamis or mudflows (CGS 2019). Seismically induced earth movements and seiches are possible in the Delta channels. However, the Project will not alter the potential for this type of event and the Project will increase the ability of the levee to protect the landside of the island from such events. The Project will have no impact.

2.11 Land Use and Planning

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Physically divide an established community?	❑	❑	❑	✓
b) Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	❑	❑	❑	✓

2.11.1 Environmental setting

The zone designation for Grand Island under the Sacramento County General Plan (2011) is recreation (http://generalmap.gis.saccounty.net/JSViewer/county_portal.html#). Grand Island is also part of the Delta Primary Zone, as defined by the Delta Protection Act of 1992. The Primary Zone includes approximately 500,000 acres of waterways, levees and farmed lands throughout five counties (DPC 1995). The Land Use and Resource Management Plan for the Primary Zone of the Delta guides planning for the conservation and enhancement of the natural resources of the Delta, while sustaining agriculture and meeting increased recreational demand (DPC 1995).

Grand Island is located within in the area covered by the Delta Plan, a comprehensive, long-term management plan for the Delta and Suisun Marsh required by the 2009 Delta Reform Act. The Delta Reform Act also included the creation of The Delta Stewardship Council, the state agency responsible for developing and implementing the Delta Plan. The Delta Plan includes new rules and recommendations based on the best available science to achieve the coequal goals of protecting and enhancing the Delta ecosystem and providing for a more reliable water supply for California, while protecting and enhancing the unique agricultural, cultural, and recreational, characteristics of the Delta. The Project will not be considered a "covered action" under the Delta Plan, since California Water Code section 85057.5(b)(5) states that a "covered action" does not

include routine maintenance and operation of a facility located in the Delta that is owned or operated by a local public agency.

2.11.2 Findings

a) Would the Project physically divide an established community?

There are no established communities located at the Project Area. The Project will not change the character or access to any of the residences or farm buildings; therefore, the Project will have no impact.

b) Would the Project cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The Project will not conflict with goals or policies in the Sacramento County General Plan (Sacramento County 2011) or the Land Use and Resource Management Plan for the Primary Zone of the Delta (DPC 1995). Thus, the Project will have no impact.

2.12 Mineral Resources

Issues	Potentially significant impact	Less than significant with mitigation incorporated	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?	❑	❑	❑	✓
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?	❑	❑	❑	✓

2.12.1 Environmental setting

There are few mineral resources of economic value found in the Delta, although extraction of peat and sand-gravel does occur on other Delta islands.

2.12.2 Findings

a) Would the Project 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?

There are no known mineral resources in the Project Area. The Project will have no impact on the availability of mineral resources.

b) Would the Project 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?

There are no known mineral resources in the Project Area. The Project will have no impact.

2.13 Noise

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	❑	❑	❑	✓
b) Generation of excessive ground borne vibration or ground borne noise levels?	❑	❑	❑	✓
c) For a Project located within the vicinity of a private airstrip or 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?	❑	❑	❑	✓

2.13.1 Environmental setting

Noise-sensitive land uses are defined as uses that can be adversely affected by high levels of noise. Residences, schools, hospitals, nursing homes, religious facilities, libraries, hotels, and other areas of similar use are often considered to be sensitive receptors to noise. The nearest sensitive receptors to the Project Area are Hidden Harbor Marina (a private boating facility at the confluence of Cache and Steamboat Sloughs) located over 500 ft away to the northwest of the Project Area, and two farm residences on Grand Island located approximately 0.3 to 0.5 miles away to the northeast of the Project Area.

Due to its remote location in the Delta, there is relatively low ambient noise in the Project Area. Ambient noise in the Project vicinity is primarily from routine agricultural and maintenance activities on Grand Island, low levels of vehicular traffic on nearby Grand Island Road, and boat traffic along Steamboat Slough.

Noise can be defined as unwanted sound and is generally measured in decibels (dB). In order to make the measurements more quantifiable by humans, the decibel scale is weighted. The most common metric is A-weighting, which measures noise levels in a way that can be easily perceived by humans. A whisper is about 30 dBA, normal speaking is roughly 60 dBA, and a shout is about 100 dBA. Based on this scale, a change of 3 dBA is considered noticeable, but acceptable. A significant impact could result from an increase of 5 dBA or more. Long-term exposure to noises, exceeding a level of 70 dBA, can cause hearing loss.

The Sacramento County noise ordinance for unincorporated areas is in the Sacramento County Code, Chapter 6.68. Exterior noise standards for agricultural and residential properties are 55 dB

between 7:00 am and 10:00 pm, and 50 dB between 10:00 pm and 7:00 am (Sacramento County Code 6.68.070). However, noise sources associated with construction, repair, remodeling, demolition, paving, or grading of any real property are exempt from this noise ordinance, provided these activities do not take place before 6:00 am or after 8:00 pm on weekdays, and before 7:00 am or after 8:00 pm on Saturday or Sunday (Sacramento County Code 6.68.090).

2.13.2 Findings

a) Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Typical construction equipment noise emissions for the Project are estimated between 80 and 85 dB, 50 ft from the source equipment (Table 2-10). A general rule is that noise commonly decreases by 10 dB with every 100 ft distance from the source (Solano County Planning Department 1977). Applying this general rule, construction equipment noise emissions would be at or below the Sacramento exterior noise standards (55 dB) during the hours of construction at locations between approximately 350 ft and 900 ft from the Project Area and not audible at locations greater than 900 ft away from the source.

Table 2-10. Typical construction equipment noise levels.

Equipment description	Typical noise level (dB) at 50 feet[1]	Typical noise level (dB) at 350 feet[2]
Backhoe	80	50
Dozer	85	55
Dump Truck	84	54
Excavator	85	55
Flat Bed Truck	84	54
Front End Loader	80	50
Grader	85	55
Scraper	85	55
Tractor	84	55

[1] Source: USDOT 2006
[2] Calculated based on general rule that noise commonly decreases by 10 dB with every 100 ft distance from the source (Solano County Planning Department 1977)

Noise levels during Project implementation will not exceed 55 dB for nearby farm residences or people that may reside at the Hidden Harbor Marina, and there will be no impact.

b) Would the Project result in generation of excessive ground borne vibration or ground borne noise levels?

As discussed under (a) above, noise levels during Project implementation will not exceed 55 dB for nearby farm residences or people that may reside at the Hidden Harbor Marina. Similarly, these sensitive receptors are far enough away as to not experience Project-related ground borne vibration. There will be no impact.

c) For a Project located within the vicinity of a private airstrip or 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?

The Project is not located within the vicinity of a private airstrip or within two miles of a public airport or public use airport. There will be no impact.

2.14 Population and Housing

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Induce substantial unplanned 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)?	❑	❑	❑	✓
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	❑	❑	❑	✓

2.14.1 Environmental setting

The majority of Grand Island is not zoned for housing and is managed primarily for agriculture. The island currently includes some clusters of buildings which include abandoned buildings, agricultural buildings, a few active residences in the southern part of the island, and a small town near Walnut Grove. Project activities will avoid both active residences and abandoned buildings.

2.14.2 Findings

a) Would the Project induce substantial 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)?

This Project does not include any elements that would induce population growth. There will be no impact.

b) Would the Project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Existing housing on Grand Island will not be displaced. There will be no impact.

2.15 Public Services

Issues	Potentially significant impact	Less than significant with mitigation incorporated	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:	❑	❑	❑	✓
Fire protection?	❑	❑	❑	✓
Police protection?	❑	❑	❑	✓
Schools?	❑	❑	❑	✓
Parks?	❑	❑	❑	✓
Other public facilities?	❑	❑	❑	✓

2.15.1 Environmental setting

Grand Island is primarily managed for agriculture. This island has a low population of residents located in small communities scattered in small areas throughout the island perimeter. No government facilities, public resources, or services occur on the island near the Project Area.

2.15.2 Findings

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?
Police protection?
Schools?
Parks?
Other public facilities?

There will be no new fire protection services, police protection services, schools, parks, or other public facilities needed as a result of the Project. There will be no impact.

2.16 Recreation

Issues	Potentially significant impact	Less than significant with mitigation incorporated	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?	❑	❑	❑	✓
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?	❑	❑	❑	✓

2.16.1 Environmental setting

The Sacramento-San Joaquin Delta waterways surrounding Grand Island (Sacramento River and Steamboat Slough) are a recreation destination for boating, fishing, wildlife viewing, and hunting. Grand Island is not, however, designated by the County as a Recreation Area, Boater Destination Site, or Fishing Access Site.

2.16.2 Findings

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?

The Project will not change the current use of existing recreational facilities on or near the island. There will be no impact.

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?

The Project does not include recreational facilities or require the construction or expansion of recreational facilities. There will be no impact.

2.17 Transportation

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	❑	❑	❑	✓
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	❑	❑	❑	✓
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	❑	❑	❑	✓
d) Result in inadequate emergency access?	❑	❑	❑	✓

2.17.1 Environmental setting

Travelers on Grand Island's roads include residents, regional commuters, truckers, and travelers driving to and from businesses, water access points, and other recreation areas in this region of the Delta. Grand Island is accessible from the north via State Highway 160/Steamboat Slough Bridge, from the east via Walnut Grove Road/Walnut Grove Bridge, from the south via Highway 160/Isleton Bridge, and from the west via State Route 220 and Caltrans ferry service ("J-Mack Ferry") across Steamboat Slough (Section 1.1, Figure 1-1). The Project Area can be accessed overland via Grand Island Road or by boat via Steamboat Slough. Grand Island Road is a County road in unincorporated Sacramento County; it is not currently or planned to be an arterial thoroughfare or collector road. Sacramento County roads have an un-posted maximum speed limit of 55 mph. The Sacramento County Maintenance & Operations Division (M&O) maintains, operates and improves unincorporated area roadways, including Grand Island Road.

The Project Area can be accessed using Grand Island Road. The levee road along the Project Area is private, located behind a locked gate at Station 562+00. This section of levee road is not used by the public.

2.17.2 Findings

a) Would the Project conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

There are no known transportation plans, ordinances, or policies established for Grand Island. There will be no impact.

b) Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

There will be a temporary and localized increase in truck traffic from haul trucks making trips to and from the Project Area to off-site commercial import material sources during each day of construction. Haul routes will be selected to avoid schools, parks, and high pedestrian use areas, which is feasible since the Project Area is in a rural, low-population-density area. Grand Island Road is not a thoroughfare arterial or collector road. There will be no impact.

c) Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The design features of the improved levee road will the same as the existing road and will be compatible with existing uses. There will be no impact.

d) Would the Project result in inadequate emergency access?

The Project levee road is not used for emergency access; there will be no impact.

2.18 Utilities and Service Systems

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	❑	❑	❑	✓
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years?	❑	❑	❑	✓
c) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	❑	❑	❑	✓
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	❑	❑	❑	✓
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	❑	❑	❑	✓

2.18.1 Environmental setting

Existing public liquid waste facilities in Sacramento County include the regional sewage system for the urbanized area; localized sewer systems in Walnut Grove, Isleton, Galt, Rancho Murieta, Hood, Courtland, and Locke; and dedicated single-facility systems at Boy's Ranch, Rio Cosumnes Correctional Center, and Metro Airport. The remainder of the County is served by private septic systems. Utilities available in the Project Area include electricity.

Wastewater treatment for residences near the Project Area is by private septic systems. There are no known public wastewater treatment facilities or stormwater drainage facilities on the western portion of Grand Island.

2.18.2 Findings

a) Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The Project will not require or result in the relocation or construction of new or expanded utilities. There will be no impact.

b) Would the Project have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years?

The Project will have sufficient water to supply water trucks that will provide dust abatement during construction. The Project is not related to any future development. There will be no impact.

c) Would the Project result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

The Project will not create a need for increased wastewater treatment capacity. There will be no impact.

d) Would the Project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

The Project will not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. There will be no impact.

e) Would the Project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The Project will comply with federal, state, and local management and reduction statutes and regulations related to solid waste. There will be no impact.

2.19 Mandatory Findings of Significance

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	❑	✓	❑	❑
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects)	❑	❑	✓	❑
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	❑	❑	❑	✓

3 DETERMINATION

On the basis of this initial evaluation:

I find that the Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	❑
I find that although the 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 Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	❑
I find that the 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 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 Project, nothing further is required.	❑

_____ _____
Signature Date

_____ _____
Printed Name For

4 LIST OF PREPARERS

The table below lists the preparers of this IS/MND and participants in the related planning, data gathering, and analytical tasks.

Name	Title	Affiliation	Project role
Mike Kynett, P.E.	Project Engineer	MBK Engineers	Engineering, Project design
Tina Anderson	Water Resources Associate	MBK Engineers	Project management and support
Christian Braudrick, PhD.	Senior Geomorphologist	Stillwater Sciences	Senior review: geology and soils, hazards and hazardous materials, hydrology and water quality, mineral resources
AJ Keith	Senior Aquatic Ecologist	Stillwater Sciences	Senior review
Crystal Garcia	Biologist	Stillwater Sciences	Environmental analysis, document preparation
Holly Burger	Senior Wildlife Biologist	Stillwater Sciences	Project management, senior review, environmental analysis including wildlife resources, and document preparation/production
Joey Verdian	Geologist	Stillwater Sciences	Environmental analysis, document preparation: geology and soils, hazards and hazardous materials, hydrology and water quality, mineral resources
Karley Rodriguez	GIS Analyst	Stillwater Sciences	GIS support, maps
Kelli Wheat Dawson	Document Production	Stillwater Sciences	Document production
Megan Keever	Senior Botanist	Stillwater Sciences	Senior review: wetlands
Nicole Jurjavcic	Senior Botanist	Stillwater Sciences	Senior review: botanical resources
Rob Thoms	Botanist & Plant Ecologist	Stillwater Sciences	Environmental analysis, document preparation: botanical resources
Wayne Swaney	Environmental Scientist	Stillwater Sciences	Environmental analysis, document preparation: air quality, greenhouse gases
Christina Spellman	Archaeologist	Albion Environmental	Cultural resources
Douglas Ross, PhD.	Senior Historical Archaeologist	Albion Environmental	Cultural resources
Matt Manigault	Archaeologist	Albion Environmental	Cultural resources
Stella D'Oro	Senior Archaeologist	Albion Environmental	Cultural resources

5 CONSULTATION AND COORDINATION

5.1 Agency Personnel Consulted

The following agency personnel were consulted during the drafting of this document:

- Peck Ha, Senior Project Manager USACE, Sacramento District California Delta Regulatory Section

5.2 Public Involvement

The Draft IS/MND will be circulated to agencies, individuals, and/or organizations known to have a special interest in the proposed Project and will be made available to the public for a 30-day review period. Comments will be received and addressed or incorporated into the Project as appropriate. The public will be notified as follows:

- A Notice of Intent (NOI) to adopt an MND will be posted for publication in a local newspaper and filed with the Sacramento County Clerk.
- Copies of the proposed IS/MND, with an attached Notice of Completion (NOC), will be submitted to the State Clearinghouse for distribution.
- Copies of the proposed IS/MND will be distributed by the State Clearinghouse to interested parties.
- Copies of the proposed IS/MND will be made available for public review at MBK Engineers offices in Sacramento.

6 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

6.1 Federal

Clean Air Act. Section 176(c) of this act prohibits federal action or support of activities that do not conform to a State Implementation Plan. The Project is not expected to violate any air quality standard, increase air quality violations in the Project region, exceed the USEPA's general conformity *de minimis* threshold, or hinder the attainment of air quality objectives in the local air basin. The Project will have no adverse effect on the future air quality of the Project Area and is in compliance with this act.

Clean Water Act (Sections 401 and 404). Section 404 of this act requires that a permit be obtained from the USACE for fill of waters of the U.S., including wetlands, prior to Project implementation. In compliance with Section 401 of the Act, a water quality certification or a waiver of water quality certification needs to be obtained from the Central Valley Regional Water Quality Control Board (RWQCB). Section 404 and 401 permits will be secured prior to Project implementation, in compliance with this act.

Endangered Species Act. The ESA prohibits unauthorized take of species listed or proposed for listing as threatened or endangered. The ESA also ensures that the actions of federal agencies do not jeopardize the continued existence of threatened and endangered species. Implementation of this Project requires a Clean Water Act Section 404 Permit from the U.S. Army Corps of Engineers, which provides the federal nexus for NMFS and USFWS technical assistance and/or consultation under Section 7 of the ESA. The conservation measures incorporated into the Project will assure compliance with the ESA.

Migratory Bird Treaty Act. Protection of migratory birds, their occupied nests, and their eggs is required by the Migratory Bird Treaty Act (MBTA) (16 USC 703 et seq.), Title 50 Code of Federal Regulations (part 10), and CDFG Code Sections 3503, 3513, and 3800. The full list of the species protected under the MBTA appears in Title 50, Section 10.13, of the Code of Federal Regulations (50 CFR 10.13) and includes federally and state-listed migratory birds as well as other non-listed migratory birds. Conservation measures incorporated into the Project will assure compliance with the MBTA.

6.2 State

California Environmental Quality Act. This Initial Study/Mitigated Negative Declaration has been prepared to comply with CEQA.

California Endangered Species Act. Generally, CDFW administers the state laws providing protection of fish and wildlife resources, including the CESA. CESA parallels the ESA and was written to protect state endangered and threatened species. Conservation measures incorporated into the Project, including consultation with CDFW regarding state-listed and special-status species that may be impacted, will assure compliance with CESA.

Native Plant Protection Act. The California Native Plant Protection Act (NPPA) of 1973 directed CDFW to preserve, protect, and enhance native plants. It gave CDFW the power to designate native plants as endangered or rare and requires that landowners who have been notified of state-listed species on their property, and who wish to destroy those plants and their habitat, must provide CDFW with 10 days' notice to salvage the plants before destruction occurs. Many of the species designated under the NPPA were subsumed by CESA, but there is a subset of species, subspecies, and varieties of plants that were not, and are protected as rare under the NPPA. Conservation measures incorporated into the Project, which include NPPA rare plants that may be impacted, will assure compliance with NPPA.

Fish and Game Code Sections 3503 and 3513. Under California Fish and Game Code Section 3503 it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided. Fish and Game Code Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests and under Section 3513 it is unlawful to take or possess any migratory non-game bird designated under the MBTA. Conservation measures incorporated into the Project will assure compliance with these Fish and Game Code sections.

Fish and Game Code Wetland Regulation (Section 1600 et seq.). California Fish and Game Code Section 1600 et seq. gives authority to CDFW to regulate activities that would interfere with the natural flow of, or substantially alter the channel, bed, or bank of a lake, river, or stream. Any work on the waterside levee, from the hinge point down, requires the District to notify CDFW and apply for a Lake or Streambed Alteration Agreement. If it is determined that the activity will have substantial adverse effects on fish and wildlife resources, the Lake or Streambed Alteration Agreement includes conditions to protect these resources. A Lake and Streambed Alteration Agreement will be secured prior to Project implementation, in compliance with this regulation.

Delta Protection Act. The Delta Protection Act was established in recognition of the increasing threats to the resources of the Primary Zone of the Delta from urban and suburban encroachment which have the potential to impact agriculture, wildlife habitat, and recreational uses. Pursuant to the Delta Protection Act, the Land Use and Resource Management Plan for the Primary Zone of the Delta was completed and adopted by the Delta Protection Commission in 1995 (updated in 2002). The Project will not result in urban or suburban encroachment and is, therefore, in compliance with this act.

6.3 Local

Sacramento County Tree Preservation and Protection Ordinance. Title 19 of the Sacramento County Code establishes guidelines for the planting, removal and protection of public trees as well as heritage or landmark trees. The Ordinance requires the protection of all native oak trees having a single trunk of 6 inches diameter at breast height (dbh) (measured 4.5 ft above ground level) or greater, or with multiple trunks having an aggregate diameter of 10 inches dbh or greater. A native oak tree is defined by the ordinance as any of the following: valley oak (*Quercus lobata*), interior live oak (*Quercus wislizenii*), blue oak (*Quercus douglasii*), or oracle oak (*Quercus morehus*). The removal of any protected native oaks trees must be authorized through a removal permit. This ordinance is required of all non-discretionary projects and provides for protection and mitigation for discretionary projects. Grading is limited beneath oak trees and any protected oak trees damaged during construction would require mitigation as specified in the ordinance.

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Appendices

Appendix A

Database Query Results for Special-status Plant Species and Sensitive Natural Communities in the Project Region

Table A-1. Database query results for special-status plant species documented in Grand Island Project region.

Scientific name	Common name	Query sources	Status[1]: Federal/ State/CRPR	Blooming period	Elevation range (ft)	Suitable habitat type	Potential to occur in Project Area
Astragalus tener var. *ferrisiae*	Ferris' milk-vetch	CNDDB, CNPS	None/None/1B.1	Apr-May	7–246	Vernally mesic meadows and seeps, and subalkaline flats in valley and foothill grassland	None; no suitable habitat present
Astragalus tener var. *tener*	alkali milk-vetch	CNDDB, CNPS	None/None/1B.2	Mar-Jun	3–197	Playas, adobe clay valley and foothill grassland, vernal pools	None; no suitable habitat present
Atriplex cordulata var. *cordulata*	heartscale	CNDDB, CNPS	None/None/1B.2	Apr-Oct	0–1,837	Saline or alkaline soils in chenopod scrub, meadows and seeps, and sandy valley and foothill grassland	None; no suitable habitat present
Atriplex coronata var. *coronata*	crownscale	CNPS	None/None/4.2	Mar-Oct	3–1,936	Alkaline often clay soils in chenopod scrub, valley and foothill grassland, and vernal pools	None; no suitable habitat present
Atriplex depressa	brittlescale	CNDDB, CNPS	None/None/1B.2	Apr-Oct	3–1,050	Alkaline clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools	None; no suitable habitat present
Atriplex persistens	vernal pool smallscale	CNDDB, CNPS	None/None/1B.2	Jun-Oct	33–377	Alkaline vernal pools	None; no suitable habitat present
Blepharizonia plumosa	big tarplant	CNDDB, CNPS	None/None/1B.1	Jul-Oct	98–1,657	Usually clay soils in valley and foothill grassland	None; no suitable habitat present
Brasenia schreberi	watershield	CNDDB, CNPS	None/None/2B.3	Jun-Sep	98–7,218	Freshwater marshes and swamps	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
California macrophylla	round-leaved filaree	CNDDB, CNPS	None/None/1B.2	Mar-May	49–3,937	Clay soils in cismontane woodland and valley and foothill grassland	Low; suitable habitat not likely present and not documented during 2018 botanical surveys

Scientific name	Common name	Query sources	Status[1]: Federal/ State/CRPR	Blooming period	Elevation range (ft)	Suitable habitat type	Potential to occur in Project Area
Carex comosa	bristly sedge	CNDDB, CNPS	None/None/2B.1	May-Sep	0–2,051	Coastal prairie, marshes and swamps, lake margins, and valley and foothill grassland	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
Centromadia parryi subsp. *parryi*	pappose tarplant	CNDDB, CNPS	None/None/1B.2	May-Nov	0–1,378	Alkaline, vernally mesic seeps and sometimes roadsides in valley and foothill grassland and vernal pools	None; no suitable habitat present
Centromadia parryi subsp. *rudis*	Parry's rough tarplant	CNPS	None/None/4.2	May-Oct	0–328	Valley and foothill grassland and vernal pools	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
Chloropyron molle subsp. *molle*	soft bird's-beak	CNDDB, CNPS	FE/CR/1B.2	Jul-Nov	0–10	Coastal salt marshes and swamps	None; no suitable habitat present
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	CNDDB, CNPS	None/None/2B.1	Jul-Sep	0–656	Coastal, fresh, or brackish marshes and swamps	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
Convolvulus simulans	small-flowered morning-glory	CNPS	None/None/4.2	Mar-Jul	98–2,428	Clay soils and serpentinite seeps in chaparral, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
Cryptantha hooveri	Hoover's cryptantha	CNDDB, CNPS	None/None/1A	Apr-May	30–492	Inland dunes and sandy soils in valley and foothill grassland	None; no suitable habitat present
Downingia pusilla	dwarf downingia	CNDDB, CNPS	None/None/2B.2	Mar-May	3–1,460	Mesic valley and foothill grassland, vernal pools	None; no suitable habitat present
Eriogonum nudum var. *psychicola*	Antioch Dunes buckwheat	CNDDB, CNPS	None/None/1B.1	Jul-Oct	0–66	Inland dunes	None; no suitable habitat present
Eriogonum truncatum	Mt. Diablo buckwheat	CNDDB, CNPS	None/None/1B.1	Apr-Sep (Nov-Dec)	10–1,148	Sandy soils in chaparral, coastal scrub, and valley and foothill grassland	None; no suitable habitat present

Scientific name	Common name	Query sources	Status[1]: Federal/ State/CRPR	Blooming period	Elevation range (ft)	Suitable habitat type	Potential to occur in Project Area
Erysimum capitatum var. *angustatum*	Contra Costa wallflower	CNDDB, CNPS	FE/CE/1B.1	Mar-Jul	10–66	Inland dunes	None; no suitable habitat present
Eschscholzia rhombipetala	diamond-petaled California poppy	CNDDB, CNPS	None/None/1B.1	Mar-Apr	0–3,199	Alkaline and clay soils in valley and foothill grassland	None; no suitable habitat present
Extriplex joaquinana	San Joaquin spearscale	CNDDB, CNPS	None/None/1B.2	Apr-Oct	3–2,740	Alkaline areas in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland	None; no suitable habitat present
Fritillaria liliacea	fragrant fritillary	CNDDB, CNPS	None/None/1B.2	Feb-Apr	10–1,345	Often serpentinite soils in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
Gratiola heterosepala	Boggs Lake hedge-hyssop	CNDDB, CNPS	None/CE/1B.2	Apr-Aug	33–7,792	Clay soils in marshes and swamps, lake margins, and vernal pools	None; no suitable habitat present
Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	CNDDB, CNPS	None/None/1B.2	Jun-Sep	0–394	Freshwater marshes and swamps, often in riprap on sides of levees	Moderate; suitable habitat may be present, and the species was previously documented on Grand Island, but it was not documented during 2018 botanical surveys
Isocoma arguta	Carquinez goldenbush	CNDDB, CNPS	None/None/1B.1	Aug-Dec	3–66	Alkaline soils in valley and foothill grassland	None; no suitable habitat present
Juglans hindsii	Northern California black walnut	CNDDB, CNPS	None/None/1B.1	Apr-May	0–1,444	Riparian forest, riparian woodland	High; documented in the Project Area; however, black walnuts in the area are likely of hybrid origin and thus not protected, and it was not documented during 2018 botanical surveys

Scientific name	Common name	Query sources	Status[1]: Federal/ State/CRPR	Blooming period	Elevation range (ft)	Suitable habitat type	Potential to occur in Project Area
Lasthenia conjugens	Contra Costa goldfields	CNPS	FE/None/1B.1	Mar-Jun	0–1,542	Mesic soils in cismontane woodland, alkaline playas, valley and foothill grassland, and vernal pools	None; no suitable habitat present
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	CNDDB, CNPS	None/None/1B.2	May-Jul (Aug-Sep)	0–16	Freshwater and brackish marshes and swamps	High; suitable habitat is present, the species was previously documented on Grand Island (CDFW 2018a) but was not documented during 2018 botanical surveys
Legenere limosa	legenere	CNDDB, CNPS	None/None/1B.1	Apr-Jun	3–2,887	Vernal pools	None; no suitable habitat present
Lepidium latipes var. *heckardii*	Heckard's pepper-grass	CNDDB, CNPS	None/None/1B.2	Mar-May	7–656	Alkaline flats in valley and foothill grassland	None; no suitable habitat present
Lilaeopsis masonii	Mason's lilaeopsis	CNDDB, CNPS	None/CR/1B.1	Apr-Nov	0–33	Freshwater and brackish marshes and swamps, riparian scrub	High; the species was previously documented within the Project Area (CDFW 2018a) but was not documented during 2018 botanical surveys
Limosella australis	Delta mudwort	CNDDB, CNPS	None/None/2B.1	May-Aug	0–10	Usually mud banks in freshwater and brackish marshes and swamps and riparian scrub	High; often co-occurs with Mason's lilaeopsis, which was previously documented within the Project Area, but it was not documented during 2018 botanical surveys
Madia radiata	showy golden madia	CNPS	None/None/1B.1	Mar-May	82–3,986	Cismontane woodland and valley and foothill grassland	Low; suitable habitat not likely present and not documented during 2018 botanical surveys

Scientific name	Common name	Query sources	Status[1]: Federal/ State/CRPR	Blooming period	Elevation range (ft)	Suitable habitat type	Potential to occur in Project Area
Myosurus minimus subsp. *apus*	little mousetail	CNPS	None/None/3.1	Mar-Jun	66–2,100	Alkaline soils in valley and foothill grassland and vernal pools	None; no suitable habitat present
Navarretia leucocephala subsp. *bakeri*	Baker's navarretia	CNDDB, CNPS	None/None/1B.1	Apr-Jul	16–5,709	Mesic soils in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools	None; no suitable habitat present
Neostapfia colusana	Colusa grass	CNDDB, CNPS	FT/CE/1B.1	May-Aug	16–656	Large adobe vernal pools	None; no suitable habitat present
Oenothera deltoides subsp. *howellii*	Antioch Dunes evening-primrose	CNDDB, CNPS	FE/CE/1B.1	Mar-Sep	0–98	Inland dunes	None; no suitable habitat present
Plagiobothrys hystriculus	bearded popcornflower	CNDDB, CNPS	None/None/1B.1	Apr-May	0–899	Mesic soils in valley and foothill grassland and margins of vernal pools	None; no suitable habitat present
Potamogeton zosteriformis	eel-grass pondweed	CNDDB, CNPS	None/None/2B.2	Jun-Jul	0–6,102	Freshwater marshes and swamps	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
Puccinellia simplex	California alkali grass	CNDDB, CNPS	None/None/1B.2	Mar-May	7–3,051	Alkaline, vernally mesic sinks, flats, and lake margins in chenopod scrub, meadows and seeps, valley and foothill grassland	None; no suitable habitat present
Sagittaria sanfordii	Sanford's arrowhead	CNDDB, CNPS	None/None/1B.2	May-Oct (Nov)	0–2,133	Shallow freshwater marshes and swamps	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
Scutellaria galericulata	marsh skullcap	CNDDB, CNPS	None/None/2B.2	Jun-Sep	0–6,890	Lower montane coniferous forest, mesic meadows and seeps, and marshes and swamps	Low; suitable habitat not likely present and not documented during 2018 botanical surveys

Scientific name	Common name	Query sources	Status[1]: Federal/ State/CRPR	Blooming period	Elevation range (ft)	Suitable habitat type	Potential to occur in Project Area
Scutellaria lateriflora	side-flowering skullcap	CNDDB, CNPS	None/None/2B.2	Jul-Sep	0–1,640	Mesic meadows, seeps and marshes and swamps	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
Senecio hydrophiloides	sweet marsh ragwort	CNPS	None/None/4.2	May-Aug	0–9,186	Mesic soils in lower montane coniferous forest and meadows and seeps	None; no suitable habitat present
Sidalcea keckii	Keck's checkerbloom	CNDDB, CNPS	FE/None/1B.1	Apr-May (Jun)	246–2,133	Serpentinite and clay soils in cismontane woodland and valley and foothill grassland	None; Project is outside elevation range
Symphyotrichum lentum	Suisun Marsh aster	CNDDB, CNPS	None/None/1B.2	(Apr) May-Nov	0–10	Brackish and freshwater marshes and swamps	High; previously documented within Project Area and documented during 2018 botanical surveys
Trifolium hydrophilum	saline clover	CNDDB, CNPS	None/None/1B.2	Apr-Jun	0–984	Marshes and swamps, vernal pools, and mesic alkaline soils in valley and foothill grassland	Low; suitable habitat not likely present and not documented during 2018 botanical surveys
Tuctoria mucronata	Crampton's tuctoria	CNDDB, CNPS	FE/CE/1B.1	Apr-Aug	16–33	Mesic valley and foothill grassland and vernal pools	None; no suitable habitat present

[1] Status:

Federal
FE Federally listed as endangered
FT Federally listed as threatened
– No federal status

State
SE State-listed endangered
SR State-listed as rare
– No State status

California Rare Plant Rank (CRPR)
1A Plants presumed extirpated in California and rare or extinct elsewhere
1B Plants rare, threatened, or endangered in California and elsewhere
2B Plants rare, threatened, or endangered in California, but more common elsewhere
3 More information needed about this plant, a review list
4 Plants of limited distribution, a watch list
0.1 Seriously threatened in California (high degree/immediacy of threat)
0.2 Fairly threatened in California (moderate degree/immediacy of threat)
0.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

Table A-2. Sensitive natural communities previously documented in the Project vicinity.

Natural community (Holland 1986)	State rank[2]	Elevation[3] (ft)	Habitat description[3]	Potential to occur in the Project Area
Coastal and Valley Freshwater Marsh	S2.1	0-6,889	Quiet sites (lacking significant current) permanently flooded by fresh water (rather than brackish, alkaline, or variable)	No; not found during habitat assessment or comprehensive plant surveys
Coastal Brackish Marsh	S2.1	0-660	Dense cover of perennial, emergent, herbaceous monocots up to 6 ft tall. Brackish from freshwater input (salinity may vary considerably). Intergrades with Freshwater Marshes at the mouths of rivers, especially in the Sacramento-San Joaquin River Delta	No; not found during habitat assessment or comprehensive plant surveys
Northern Claypan Vernal Pool	S1.1	0-328	Fairly old, circum-neutral to alkaline, Si-cemented hardpan soils	No; not found during habitat assessment or comprehensive plant surveys
Stabilized Interior Dunes	S1.1	0-4,921	Soil of old beach, lake deposits; dissected alluvial fans; rolling hills. Soils may be carbonate-rich, sandy.	No; not found during habitat assessment or comprehensive plant surveys
Valley Needlegrass Grassland	S1.1	0-4,265	Usually on fine-textured (often clay) soils, moist or even waterlogged during winter, but very dry in summer	No; not found during habitat assessment or comprehensive plant surveys

[1] Source: California Natural Diversity Database (CDFW 2018b)
[2] S1 Critically Imperiled: At very high risk of extinction due to extreme rarity, very steep declines, or other factors
S2 Imperiled: At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors
0.1 Very threatened
[3] Source: Holland (1986)

Appendix B

Database Query Results for Special-status Fish and Wildlife Species in the Project Region

Table B-1. Database query results for special-status wildlife and fish species documented in the Grand Island Project region.

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
Invertebrates					
Conservancy fairy shrimp *Branchinecta conservatio*	CNDDB, USFWS	FE/–	Disjunct occurrences in Tehama, Glenn, Butte, Yolo, Solano, Stanislaus, Merced, and Ventura counties	Large, deep vernal pools in annual grasslands	None; the Project Area is outside of the species' known range, and there is no suitable habitat
Vernal pool fairy shrimp *Branchinecta lynchi*	CNDDB, USFWS	FT/–	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations also in Riverside County	Vernal pools; also found in sandstone rock outcrop pools	None; there is no suitable habitat in the Project Area
Vernal pool tadpole shrimp *Lepidurus packardi*	CNDDB, USFWS	FE/–	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	None; there is no suitable habitat in the Project Area
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	USFWS	FT/–	Streamside habitats throughout the Central Valley	Riparian and oak savanna habitats below 915 m (3,000 ft) with host plant *Sambucus* sp. (blue elderberry)	Moderate; blue elderberry present adjacent to the Project Area
Delta green ground beetle *Elaphrus viridus*	CNDDB, USFWS	FT/–	Only known to occur in Solano County	Grassland habitat interspersed with vernal pools	None; the Project Area is outside of the species' range and there is no suitable habitat
Lange's metalmark butterfly *Apodemia mormo langei*	CNDDB	FE/–	Antioch Sand Dunes in Contra Costa County	Dunes; larval food plant is nakedstem buckwheat (*Eriogonum nudum* ssp. *auriculatum*); adult nectar plants include buckwheat, butterweed (*Senecio douglasii*) and snakeweed (*Gutierrezia divergens*)	None; the Project Area is outside of the species' range and there is no suitable habitat

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
San Bruno elfin butterfly *Callophrys mossii bayensis*	USFWS	FE/–	Largest population on San Bruno Mountain in San Mateo County; smaller populations may occur in Contra Costa and Marin counties	Coastal scrub; host plant is Pacific stonecrop (*Sedum spathulifolium*)	None; the Project Area is outside of the species' range and there is no suitable habitat
Fish					
Sacramento splittail *Pogonichthys macrolepidotus*	CNDDB	–/SSC	Lower portions of the Napa, Petaluma, Sacramento and San Joaquin rivers; Sacramento-San Joaquin Delta including Suisun Bay, Suisun Marsh	Low-elevation mainstem rivers and estuaries with low to moderate salinity (0-18 ppt); shallow, flooded vegetated habitat for spawning and foraging	High; the Project Area is within species' range and suitable habitat present; occurrence near Project Area in 1995
Chinook salmon, Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	NMFS	FE/SE	Sacramento River and its tributaries	Low- to mid-elevation rivers and streams with cold water, clean gravel of appropriate size for spawning and adequate rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean	High; the Project Area is within species' range and suitable habitat present
Chinook salmon, Central Valley spring-run ESU *Oncorhynchus tshawytscha*	NMFS	FT/ST	Sacramento River and its tributaries (Deer, Mill, Antelope, Battle, Beegum, Butte, and Big Chico creeks and the Feather and Yuba rivers)	Low- to mid-elevation rivers and streams with cold water, clean gravel of appropriate size for spawning and adequate rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean	High; the Project Area is within species' known range and suitable habitat present
Steelhead, Central Valley DPS *Oncorhynchus mykiss*	CNDDB, NMFS	FT/–	Sacramento and San Joaquin rivers and their tributaries	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	High; the Project Area is within species' range and suitable habitat present; occurrence near the Project Area in 2012

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
North American green sturgeon, southern DPS *Acipenser medirostris*	NMFS	FT/–	Nearshore coastal waters from Monterey Bay to Graves Harbor, Alaska. Spawning occurs in mainstem Sacramento River	The Sacramento River is an important migratory corridor for larval and juvenile sturgeon during their downstream migration.	High; the Project Area is within species' range and suitable habitat present
Delta smelt *Hypomesus transpacificus*	CNDDB, USFWS	FT/ST	Found only in the Sacramento-San Joaquin Estuary, including the lower reaches of Sacramento and Napa rivers; the Delta including Suisun Bay, Goodyear, Suisun, Cutoff, First Mallard, and Montezuma sloughs	Estuarine or brackish turbid waters up to 18 parts per thousand (ppt); spawn in shallow brackish water upstream of the mixing zone (zone of saltwater-freshwater interface) where salinity is around 2 ppt	High; the Project Area is within species' range and suitable habitat present; occurrence near Project Area in 2007
Longfin smelt *Spirnichus thaleichthys*	CNDDB	FC/ST	San Francisco estuary from Rio Vista or Medford Island in the Delta as far downstream as South Bay; concentrated in Suisun, San Pablo, and North San Francisco bays; historical populations in Humboldt Bay, Eel River estuary, and Klamath River estuary	Adults in large bays, estuaries, and nearshore coastal areas; migrate into freshwater rivers to spawn; salinities of 15–30 ppt	High; the Project Area is within species' known range and suitable habitat present; multiple occurrences near Project Area in 2012
Sacramento perch *Archoplites interruptus*	CNDDB	–/SSC	Endemic to central valley waters but currently restricted from the majority of its native range; widespread stocking has led to introduced populations in the Klamath, Pit, Walker, and Owens River basins	Sloughs, slow moving rivers, and lakes that provide warm water (18°C) during spawning	Low; suitable habitat present, though species has not been observed in Project Area since the 1980's; only populations in native range with continuous habitation occur at Clear Lake and Alameda Creek

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
Amphibians					
California tiger salamander *Ambystoma californiense*	CNDDB, USFWS	FT/ST	Very fragmented; along the coast from Sonoma County to Santa Barbara County, in the Central Valley and Sierra foothills from Sacramento County to Tulare County	Grassland, oak savannah, or edges of woodland that provide subterranean refuge (typically mammal burrows); breeds in nearby temporary ponds, vernal pools, or slow-moving parts of streams	None; the Project Area is outside of species' known range and no suitable habitat present
California red-legged frog *Rana draytonii*	USFWS	FT/SSC	Largely restricted to coastal drainages on the central coast from Mendocino County to Baja California; in the Sierra foothills south to Tulare and possibly Kern counties	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	None; the Project Area is outside of species' known range
Reptiles					
Western pond turtle *Actinemys marmorata*	CNDDB	–/SSC	From the Oregon border along the coast ranges to the Mexican border, and west of the crest of the Cascades and Sierras	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	High; the Project Area is within species' range and high quality habitat present
California legless lizard *Anniella pulchra*	CNDDB	–/SSC	Northern Contra Costa County south to northwestern Baja California; scattered occurrences in San Joaquin Valley, along the southern Sierra Nevada mountains, and in the western Mojave Desert	Sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces; warm, moist, loose soil for burrowing	None; no suitable habitat in Project Area
California glossy snake *Arizona elegans occidentalis*	CNDDB	-/SSC	Eastern part of the San Francisco Bay Area through northwestern Baja California. Absent along the central coast. There are also old reports in the Santa Monica Mountains.	Inhabits arid scrub, rocky washes, grasslands, chaparral. Appears to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing	None; no suitable habitat in Project Area

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
Giant garter snake *Thamnophis gigas*	CNDDB, USFWS	FT/ST	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	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 emergent vegetation for basking and areas of high ground protected from flooding during winter	Low; low-quality habitat in Project Area, and region outside of range of known self-sustaining populations
Birds					
White-tailed kite *Elanus leucurus*	CNDDB	–/SFP	Year-round resident; found in nearly all lowlands of California west of the Sierra Nevada mountains and the southeast deserts	Lowland grasslands and wetlands with open areas; nests in trees near open foraging area	Moderate; nesting and foraging habitat present
Swainson's hawk *Buteo swainsoni*	CNDDB	–/ST	Summer resident; breeds in lower Sacramento and San Joaquin valleys, the Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	Moderate; high-quality nesting and foraging habitat present; records of nesting in vicinity of Project Area
American peregrine falcon *Falco peregrinus anatum*	CNDDB	FD/SD, SFP	Most of California during migrations and in winter; nests primarily in the Coast Ranges, northern Sierra Nevada Mountains, and other mountainous areas of northern California	Wetlands, woodlands, cities, agricultural lands, and coastal area with cliffs (and rarely broken-top, predominant trees) for nesting; often forages near water	Low (foraging only); suitable foraging habitat occurs adjacent to Project Area, but no nesting structures

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
California black rail *Laterallus jamaicenis coturniculus*	CNDDB	–/ST, SFP	Northern San Francisco Bay area (primarily San Pablo and Suisun bays) and Sacramento-San Joaquin Delta	Large tidally-influenced marshes with saline to brackish water, typically with a high proportion of pickleweed (*Salicornia virginica*); also can be associated with bulrush (*Schoenoplectus* spp.), cattail (*Typha* spp.), or rushes (*Juncus* spp.); peripheral vegetation at and above mean high higher water necessary to protect nesting birds during extremely high tides	None; no suitable habitat in Project Area
California Ridgway's rail *Rallus obsoletus obsoletus*	USFWS	FE/SE, SFP	Predominantly in the marshes of the San Francisco estuary: South San Francisco Bay, North San Francisco Bay, San Pablo Bay, and sporadically throughout the Suisun Marsh area east to Browns Island	Salt and brackish water marshes, typically dominated by pickleweed (*Salicornia virginica*) and Pacific cordgrass (*Spartina foliosa*)	None; the Project Area is outside of species' known range
Mountain plover *Charadrius montanus*	CNDDB	–/SSC	Winter visitor; found in the Central Valley south of Yuba County, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego counties; parts of Imperial, Riverside, Kern, and Los Angeles counties	Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grain fields	None; no suitable habitat in Project Area
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	CNDDB	FT/SE	Breeds in limited portions of the Sacramento River and the South Fork Kern River; small populations may nest in Butte, Yuba, Sutter, San Bernardino, Riverside, Inyo, Los Angeles, and Imperial counties	Summer resident of valley foothill and desert riparian habitats; nests in open woodland with clearings and low, dense, scrubby vegetation	None; the Project Area is outside of species' known range

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
Western burrowing owl *Athene cunicularia hypugaea*	CNDDB	–/SSC	Year-round resident throughout much of the state; Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows	None; no suitable habitat in Project Area
Bank swallow *Riparia riparia*	CNDDB	–/ST	Summer resident; occurs along the Sacramento River from Tehama County to Sacramento County, along the Feather and lower American rivers; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou counties; small populations near the coast from San Francisco County to Monterey County	Nests in vertical bluffs or banks, usually adjacent to water, where the soil consists of sand or sandy loam	None; no suitable habitat in Project Area
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	CNDDB	–/SSC	San Francisco Bay region	Brackish marsh, riparian woodland/swamp, freshwater marsh, and salt marsh often near upland habitats	None; no suitable habitat in Project Area
Song sparrow ("Modesto" population) *Melospiza melodia*	CNDDB	–/SSC	Year-round resident; north-central portion of the Central Valley	Emergent freshwater marshes, riparian willow thickets, and riparian forests	High; suitable habitat present and documented occurrences near Project Area
Suisun song sparrow *Melospiza melodia maxillaris*	CNDDB	–/SSC	Resident of Suisun Bay	Brackish-water marshes	None; the Project Area is outside of species' known range

Common name Scientific name	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Potential to Occur in Project Area
Tricolored blackbird *Agelaius tricolor*	CNDDB	–/SSC	Permanent resident, but makes extensive migrations both in breeding season and winter; common locally throughout Central Valley and in coastal areas from Sonoma County south	Feeds in grasslands and agriculture fields; nesting habitat components include open accessible water, a protected nesting substrate (including flooded or thorny vegetation), and a suitable nearby foraging space with adequate insect prey	None; no suitable habitat in Project Area
Mammals					
Salt marsh harvest mouse *Reithrodontomys raviventris*	CNDDB	FE/SE, SFP	San Pablo, Suisun, and San Francisco bays in Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, and San Mateo counties	Tidal salt marshes; depend on dense cover, preferring pickleweed (*Salicornia pacifica*) and saltgrass	None; the Project Area is outside of species' known range
Western red bat *Lasiurus blossevillii*	CNDDB	–/SSC	Near the Pacific Coast, Central Valley, and the Sierra Nevada	Riparian forests, woodlands near streams, fields and orchards	High; suitable roosting and foraging habitat in Project Area
American badger *Taxidea taxus*	CNDDB	–/SSC	Throughout the state except in the humid coastal forests of Del Norte County and the northwest portion of Humboldt County	Shrubland, open grasslands, fields, and alpine meadows with friable soils	None; no suitable habitat in Project Area

[a] Status codes:

Federal
FE = Listed as endangered under the federal Endangered Species Act
FT = Listed as threatened under the federal Endangered Species Act
FC = Federal candidate species
FD = Federally delisted

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

Appendix C

Comprehensive List of Plant Species Documented in the Project Area

Table C-1. Comprehensive list of plant species documented in the Project Area.

Scientific name	Common name	Family	Nativity status	Cal-IPC rating
Acmispon strigosus	strigose bird's-foot trefoil	Fabaceae	Native	–
Agoseris grandiflora	bigflower agoseris	Asteraceae	Native	–
Agrostis exarata	spike bent grass	Poaceae	Native	–
Alnus rhombifolia	white alder	Betulaceae	Native	–
Ambrosia psilostachya	western ragweed	Asteraceae	Native	–
Amsinckia menziesii	common fiddleneck	Boraginaceae	Native	–
Anthriscus caucalis	bur-chervil	Apiaceae	Introduced	–
Aristolochia californica	California dutchman's pipe	Aristolochiaceae	Native	–
Artemisia douglasiana	mugwort	Asteraceae	Native	–
Asparagus officinalis subsp. *officinalis*	garden asparagus	Asparagaceae	Introduced	–
Avena barbata	slender wild oat	Poaceae	Introduced	Moderate
Avena fatua	wild oat	Poaceae	Introduced	Moderate
Baccharis pilularis	coyote brush	Asteraceae	Native	–
Baccharis salicifolia subsp. *salicifolia*	mule fat	Asteraceae	Native	–
Brassica rapa	turnip	Brassicaceae	Introduced	Limited
Bromus diandrus	ripgut grass	Poaceae	Introduced	Moderate
Bromus hordeaceus	soft chess	Poaceae	Introduced	Limited
Camissoniopsis micrantha	miniature suncup	Onagraceae	Native	–
Capsella bursa-pastoris	shepherd's purse	Brassicaceae	Introduced	–
Cardamine oligosperma	little western bittercress	Brassicaceae	Native	–
Carduus pycnocephalus subsp. *pycnocephalus*	Italian thistle	Asteraceae	Introduced	Moderate
Carex barbarae	Santa Barbara sedge	Cyperaceae	Native	–
Chenopodium album	lamb's quarters	Chenopodiaceae	Introduced	–
Claytonia perfoliata	miner's lettuce	Montiaceae	Native	–
Conium maculatum	poison hemlock	Apiaceae	Introduced	Moderate
Convolvulus arvensis	bindweed	Convolvulaceae	Introduced	–
Cortaderia selloana	pampas grass	Poaceae	Introduced	High
Crassula connata	pygmy-weed	Crassulaceae	Native	–
Cynodon dactylon	Bermuda grass	Poaceae	Introduced	Moderate
Elymus glaucus	blue or western wild-rye	Poaceae	Native	–
Elymus triticoides	beardless wild rye	Poaceae	Native	–
Equisetum arvense	common horsetail	Equisetaceae	Native	–
Equisetum laevigatum	smooth scouring rush	Equisetaceae	Native	–
Erigeron bonariensis	flax-leaved horseweed	Asteraceae	Introduced	–
Erigeron canadensis	horseweed	Asteraceae	Native	–
Erodium botrys	longbeak stork's bill	Geraniaceae	Introduced	–

Scientific name	Common name	Family	Nativity status	Cal-IPC rating
Erodium cicutarium	redstem filaree	Geraniaceae	Introduced	Limited
Euphorbia maculata	spotted spurge	Euphorbiaceae	Introduced	–
Festuca myuros	rattail sixweeks grass	Poaceae	Introduced	Moderate
Festuca perennis	rye grass	Poaceae	Introduced	Moderate
Foeniculum vulgare	fennel	Apiaceae	Introduced	Moderate
Fraxinus latifolia	Oregon ash	Oleaceae	Native	–
Galium aparine	goose grass	Rubiaceae	Native	–
Geranium dissectum	cutleaf geranium	Geraniaceae	Introduced	Limited
Geranium molle	dovefoot geranium	Geraniaceae	Introduced	–
Helminthotheca echioides	bristly ox-tongue	Asteraceae	Introduced	Limited
Heterotheca grandiflora	telegraph weed	Asteraceae	Native	–
Hirschfeldia incana	shortpod mustard	Brassicaceae	Introduced	Moderate
Hordeum murinum	wall barley	Poaceae	Introduced	Moderate
Hydrocotyle ranunculoides	floating marshpennywort	Araliaceae	Native	–
Juglans hindsii	Northern California black walnut	Juglandaceae	Native	–
Juncus patens	spreading rush	Juncaceae	Native	–
Lactuca biennis	tall blue lettuce	Asteraceae	Native	–
Lactuca serriola	prickly lettuce	Asteraceae	Introduced	–
Lamium amplexicaule	henbit	Lamiaceae	Introduced	–
Lathyrus jepsonii var. *californicus*	California pea	Fabaceae	Native	–
Lepidium latifolium	perennial pepperweed	Brassicaceae	Introduced	High
Lepidium nitidum	shining pepperweed	Brassicaceae	Native	–
Lupinus bicolor	miniature lupine	Fabaceae	Native	–
Malva parviflora	cheeseweed	Malvaceae	Introduced	–
Melilotus indicus	sourclover	Fabaceae	Introduced	–
Phoradendron leucarpum subsp. *macrophyllum*	mistletoe	Viscaceae	Native	–
Phragmites australis	common reed	Poaceae	Native	–
Pseudognaphalium luteoalbum	Jersey cudweed	Asteraceae	Introduced	–
Quercus lobata	valley oak	Fagaceae	Native	–
Quercus wislizeni	interior live oak	Fagaceae	Native	–
Raphanus sativus	radish	Brassicaceae	Introduced	Limited
Robinia pseudoacacia	black locust	Fabaceae	Introduced	Limited
Rosa californica	California rose	Rosaceae	Native	–
Rubus armeniacus	Himalayan blackberry	Rosaceae	Introduced	High
Rubus ursinus	California blackberry	Rosaceae	Native	–
Salix exigua	narrowleaf willow	Salicaceae	Native	–
Salix gooddingii	Goodding's black willow	Salicaceae	Native	–

Scientific name	Common name	Family	Nativity status	Cal-IPC rating
Salix lasiolepis	arroyo willow	Salicaceae	Native	–
Salsola tragus	Russian thistle	Chenopodiaceae	Introduced	Limited
Sambucus nigra subsp. *caerulea*	blue elderberry	Adoxaceae	Native	–
Schoenoplectus acutus var. *occidentalis*	common tule	Cyperaceae	Native	–
Schoenoplectus californicus	southern bulrush	Cyperaceae	Native	–
Senecio vulgaris	common groundsel	Asteraceae	Introduced	–
Silybum marianum	blessed milkthistle	Asteraceae	Introduced	Limited
Sonchus asper subsp. *asper*	prickly sow thistle	Asteraceae	Introduced	–
Stellaria media	common chickweed	Caryophyllaceae	Introduced	–
Symphyotrichum lentum[1]	Suisun Marsh aster	Asteraceae	Native	–
Tetrapteron graciliflorum	hill sun cup	Onagraceae	Native	–
Typha latifolia	broad-leaved cattail	Typhaceae	Native	–
Urtica urens	dwarf nettle	Urticaceae	Introduced	–
Vicia villosa subsp. *villosa*	winter vetch	Fabaceae	Introduced	–
Vitis californica	California wild grape	Vitaceae	Native	–

[1] Special-status species