

# CEQA ADDENDUM

## TULE RED RESTORATION PROJECT

STATE CLEARINGHOUSE NUMBER 2003112039

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## Acronyms and Abbreviations

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AMAT	Adaptive Management Advisory Team
BAAQMD	Bay Area Air Quality Management District
BCDC	Bay Conservation and Development Commission
BMPs	best management practices
CAC	California Administrative Code
CALFED	CALFED Bay-Delta Program
CCWD	Contra Costa Water District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CMC	Construction Management Center
CNDDB	California Natural Diversity Database
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
Corps	U.S. Army Corps of Engineers
CRHR	California Register of Historic Resources
CVP	Central Valley Project
DO	dissolved oxygen
DWR	Department of Water Resources
ECs	environmental commitments
EFH	essential fish habitat
ERPP	Ecosystem Restoration Program Plan
ESA	Endangered Species Act
FAST	Fishery Agency Strategy Team
fps	feet per second
FRPA	Fish Restoration Program Agreement
GHGs	greenhouse gases
GPS	global positioning system
Hg	mercury
HMMP	Hazardous Materials Management Plan
Marsh	Suisun Marsh
MeHg	methylmercury
mg/kg	milligram per kilogram
MMs	mitigation measures
MT/yr	metric tons per year
NAHC	Native American Heritage Commission

NEPA	National Environmental Policy Act
ng/L	nanograms per liter
NMFS	National Marine Fisheries Service
NO <sub>x</sub>	oxides of nitrogen
NRHP	National Register of Historic Places
PM10	particulate matter 10 microns in diameter or less
PM2.5	particulate matter 2.5 microns in diameter or less
ppm	parts per million
PRC	Public Resources Code
Principals	Suisun Principal Agencies
proposed project	Tule Red Restoration Project
Reclamation	Bureau of Reclamation
ROG	reactive organic gas
RPA	Reasonable and Prudent Alternative
RWQCB	Regional Water Quality Control Board
Service or USFWS	U.S. Fish and Wildlife Service
SFCWA	State and Federal Contractors Water Agency
SMHM	salt marsh harvest mouse
SMP	Suisun Marsh Plan
SMP EIS/EIR	Suisun Marsh Habitat Management, Preservation, and Restoration Plan Environmental Impact Statement/Environmental Impact Report
SMPA	Suisun Marsh Preservation Agreement
SMSCG	Suisun Marsh Salinity Control Gates
SRCD	Suisun Resource Conservation District
State Water Board	State Water Resources Control Board
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
WES	Westervelt Ecological Services



This chapter presents background and introductory information to amend the *Suisun Marsh Habitat Management, Preservation, and Restoration Plan Environmental Impact Statement/Environmental Impact Report* (SMP EIS/EIR) and implement the Tule Red Restoration Project (proposed project).

## 1.1 Overview

The SMP EIS/EIR was certified by the California Department of Fish and Wildlife (CDFW) in December 2011 and the Bureau of Reclamation (Reclamation) and the U.S. Fish and Wildlife Service (Service) in April 2014. The Suisun Marsh Plan (SMP) provides a comprehensive 30-year plan for the management of activities within the Suisun Marsh (Marsh), including tidal restoration activities.

The SMP was prepared by the Suisun Principal Agencies (Principals), a group of agencies with primary responsibility for Marsh management. The intention of the SMP is to balance the benefits of tidal wetland restoration with other habitat uses in the Marsh by evaluating alternatives that provide a politically acceptable change in Marsh-wide land uses, such as salt marsh harvest mouse habitat, managed wetlands, public use, and upland habitat. The SMP relies on the incorporation of existing science and information developed through adaptive management.

The Principals are the Service, Reclamation, CDFW, California Department of Water Resources (DWR), National Marine Fisheries Service (NMFS), Suisun Resource Conservation District (SRCD), and CALFED Bay-Delta Program (CALFED). The Principals have consulted with other participating agencies, including the U.S. Army Corps of Engineers (Corps), San Francisco Bay Conservation and Development Commission (BCDC), the Regional Water Quality Control Board (RWQCB), and the State Water Resources Control Board (State Water Board), in developing the SMP.

The Principal agencies prepared the SMP EIS/EIR and analyzed the potential environmental impacts of implementing the SMP (the preferred project of the EIR/EIS). The SMP EIR/EIS programmatically evaluated the conversion of 5,000 to 7,000 acres of managed wetlands to tidal habitat over the next 30 years. The proposed project would be the first tidal restoration project within the Marsh that was planned for by the SMP and programmatically evaluated in the SMP EIS/EIR. Accordingly, the State and Federal Contractors Water Agency (SFCWA) is proposing to prepare an addendum to the SMP EIS/EIR to implement the proposed project and document potentially significant environmental impacts per the California Environmental Quality Act (CEQA).

## 1.2 Project Location and Proposed Project

Historically, the Marsh was a tidal marsh system, with the range of salinity, vegetation composition, and species utilization based on local geography and Sacramento and San Joaquin River inputs. In the late 1800s, the Marsh was diked for water management to support agriculture and duck hunting club activities.

The proposed project is adjacent to Grizzly Bay, within Suisun Marsh, in Solano County, California. The property on which the project is proposed is currently, and has been historically, managed as the Tule Red Duck Club. It is located in SMP Region 4 of the Marsh and adjacent to the Grizzly King Duck Club, the DFW Grizzly Island Wildlife Area, and Grizzly Bay. The vast majority of the site is managed marsh, with a small area of tidal marsh at the northern end of the site and along the bayside margin of the natural berm. Upland habitat is located along the uppermost crowns of the adjacent levees.

The proposed project would restore approximately 420 acres of existing managed brackish wetlands to tidal habitat, which would directly benefit federally and state-listed delta smelt, longfin smelt, and salmonids. The proposed project would introduce full daily tidal exchange to existing managed marsh habitat owned by Westervelt Ecological Services (WES) and CDFW. The proposed project is consistent with the SMP and the evaluation in the SMP EIS/EIR. The proposed project would partially fulfill the 8,000-acre tidal restoration obligations of the Fish Restoration Program Agreement (FRPA), satisfying the requirements of the Service's 2008 Biological Opinion for Delta Smelt, the 2009 NMFS Biological Opinion for the Coordinated Operations of the State Water Project (SWP) and the Federal Central Valley Project (CVP), and the Longfin Smelt Incidental Take Permit for the SWP. The proposed project is also identified as a priority restoration project under the California EcoRestore program.

## 1.3 CEQA and Addendums

The SFWCA has prepared this addendum to the final EIS/EIR for the SMP to assess the impacts associated with the proposed project that could occur since the final EIS/EIR was certified. According to Section 15164(a) of the State CEQA Guidelines, the lead agency or the responsible agency will prepare an addendum to a previously certified EIR if changes or additions are necessary but none of the conditions described in Section 15162, calling for the preparation of a subsequent or supplemental EIR, have occurred. An addendum need not be circulated for public review but can be included in or attached to the final EIR. The decision-making body considers the addendum with the final EIR prior to making a decision on the project.

Section 15162 of the State CEQA Guidelines states that, for a project covered by a certified EIR, preparation of a subsequent or supplemental EIR *rather than* an addendum is required only if one or more of the following conditions occur:

- 1) Substantial changes are proposed in the project that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
- 2) Substantial changes occur with respect to the circumstances under which the project is undertaken that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
- 3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
  - a) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

- b) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
- c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
- d) Mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The addendum is prepared in accordance with CEQA Public Resources Code (PRC) Section 21000 et seq. and the State CEQA Guidelines (California Administrative Code [CAC] Section 15000 et seq.).

## 1.4 Scope of Addendum

Section 15063(c)(3)(D) of the State CEQA Guidelines states that earlier analyses may be used where, pursuant to tiering, a program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR. The scope, content, and organization of this addendum to the SMP EIS/EIR meet the current requirements of CEQA and the State CEQA Guidelines. Although an addendum need not be noticed or circulated, SFWCA circulated a notice of the preparation of this addendum for 30 days on October 9, 2015, to the State Clearinghouse and public agencies and interested stakeholders. The notice requested written comments regarding the scope of the addendum to ensure that the appropriate range of environmental issues related to the proposed project was identified and evaluated. A total of four comments were received. These comments are included in Appendix A, *Public Comments Regarding the Notice of Preparation of an Addendum*, of this document. The comments were reviewed, and information related to the comments is incorporated in this addendum.

The addendum describes the affected environmental resources and evaluates the potential changes in the impacts that were previously described in the SMP EIS/EIR with respect to constructing and operating the proposed project. The scope of analysis in the addendum addresses each of the environmental resource areas previously analyzed in the SMP EIS/EIR, and identified in Appendix G of the State CEQA Guidelines, as listed below.

- Water Quality, Surface Hydrology, and Water Supply ( groundwater, flooding, and sediment transport)
- Biological Resources (fish, vegetation and wetlands, wildlife)
- Air Quality, Greenhouse Gases, and Climate Change
- Cultural Resources
- Land Use
- Aesthetics
- Agricultural Resources
- Geology, Soils, and Mineral Resources (levee stability)
- Hazards and Hazardous Materials (Public Health, Environmental Hazards and Transportation)
- Noise
- Recreation
- Transportation and Navigation
- Utilities and Public Services
- Population and Housing

The addendum substantiates why it is appropriate to use the SMP EIS/EIR and that no significant impacts on the environment that were not previously disclosed in SMP EIS/EIR would occur under the proposed project. Details from the project description and the SMP EIS/EIR support these conclusions.

Technical information used in the addendum to support conclusions includes the following:

- Hydraulic modeling, evaluating flow rate, velocity, and water-surface elevation
- Hydrodynamic and salinity modeling, evaluating salinity changes
- Geotechnical modeling, evaluating soil stability for the existing perimeter berm and the designed habitat levee
- Sensitive-species surveys
- Air quality analysis
- Cultural resource evaluation, documenting known cultural resources and identifying the potential for undiscovered cultural resources within the project area

The criteria for determining the significance of environmental impacts in the addendum analysis are generally the same as those used in the SMP EIS/EIR and are consistent with those described in Appendix G of the State CEQA Guidelines.

## 1.5 Addendum Organization

This addendum includes the certified final SMP EIS/EIR by reference and addresses the impacts of the changes to the project description/concept design. Section 15063(c)(3)(D) of the State CEQA Guidelines states that earlier analyses may be used where, pursuant to tiering, a program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR. The content and organization of this addendum to the previously certified final EIS/EIR are designed to meet the current requirements of CEQA and the State CEQA Guidelines.

This addendum is organized as described below.

- Chapter 1, “Introduction and Overview,” includes background and introductory information regarding the proposed modifications, the background of the project, the purpose of the addendum, and the scope and content of the document.
- Chapter 2, “Project Description and Location,” provides the location, details, and objectives of the proposed project.
- Chapter 3, “Environmental Analysis Determination,” compares the potential changes in the impacts of the proposed project to the impacts that were previously analyzed as part of the certified final EIS/EIR. This chapter identifies which effects were within the scope of and adequately analyzed in the previously certified final EIS/EIR and whether such effects were addressed by mitigation measures, based on the earlier analysis. Where appropriate, mitigation measures that are incorporated or refined from the final EIS/EIR are discussed to distinguish the extent to which they address site-specific conditions for the proposed project.

- Chapter 4, “References Cited,” identifies the documents (printed references), web sites, and individuals (personal communications) that were consulted during preparation of this addendum.
- Chapter 5, “List of Preparers,” lists the individuals who were involved in preparing this addendum.
- Appendices A through H contain detailed technical information that substantiates the claims in Chapter 3.

## 1.6 Previous Environmental Documents Incorporated by Reference

Consistent with Section 15150 of the State CEQA Guidelines, the following document was used in preparation of this addendum and is incorporated herein by reference.

- Bureau of Reclamation, U.S. Fish and Wildlife Service, and California Department of Fish and Game. 2011. *Suisun Marsh Habitat Management, Preservation, and Restoration Plan Final Environmental Impact Statement/Environmental Impact Report*. November. SCH#2003112039 (Reclamation 2011).

This document available at: [http://www.usbr.gov/mp/nepa/nepa\\_projdetails.cfm?Project\\_ID=781](http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=781)

## 1.7 Permitting Agencies

Several agencies would be involved in permitting activities for the construction and operation of the proposed project. Table 1-1 summarizes these permitting agencies and their currently expected roles.

Table 1-1. Permitting Agencies

Agency	Role
U.S. Army Corps of Engineers	Issue a Section 404/10 permit under the Clean Water Act for activities within wetlands and waters of the U.S.
U.S. Coast Guard	Coordinate with Corps on Section 10 of the Clean Water Act
U.S. Fish and Wildlife Service	Review compliance of proposed project with existing programmatic Biological Opinion for the Suisun Marsh Plan
California Department of Fish and Wildlife	Issue incidental take permit (if necessary)
State Water Resources Control Board	Issue construction general permit and approve Stormwater Pollution Prevention Plan
Regional Water Quality Control Board (#5)	Issue 401 Water Quality Certification to control pollutant discharges to water bodies
Bay Conservation and Development Commission	Issue Suisun Marsh permit
Delta Stewardship Council	Issue consistency determination regarding the Delta Plan
Solano County	Issue grading permit for construction activities and use/Marsh development permit



## 2.1 Introduction

In accordance with the California Environmental Quality Act (CEQA), the State and Federal Contractors Water Agency (SFCWA) is proposing to prepare an addendum to the *Suisun Marsh Habitat Management, Preservation, and Restoration Plan Environmental Impact Statement/Environmental Impact Report* (SMP EIS/EIR) and implement the Tule Red Restoration Project (proposed project). The SMP EIS/EIR was certified by the California Department of Fish and Wildlife (CDFW) in December 2011 and the Bureau of Reclamation (Reclamation) and the U.S. Fish and Wildlife Service (Service) in April 2014. The Suisun Marsh Plan (SMP) provides a comprehensive 30-year plan for management of activities within Suisun Marsh (Marsh), including tidal restoration activities. The SMP EIS/EIR programmatically evaluated the conversion of 5,000 to 7,000 acres of managed wetlands to tidal habitat over the next 30 years. The proposed project would be the first tidal restoration project within the Marsh that was planned for by the SMP and programmatically evaluated in the SMP EIS/EIR. Accordingly, SFCWA will prepare an addendum to the SMP EIS/EIR to document potentially significant environmental impacts.

## 2.2 Background

Historically, the Marsh was a tidal marsh system, with the range of salinity, vegetation composition, and species utilization based on local geography and Sacramento and San Joaquin River inputs. In the late 1800s, the Marsh was diked for water management to support agriculture and duck hunting club activities. Figure 1 shows the location of Suisun Marsh.

The SMP was prepared by the Suisun Principal Agencies (Principals), a group of agencies with primary responsibility for Marsh management. The intention of the SMP is to balance the benefits of tidal wetland restoration with other habitat uses in the Marsh by evaluating alternatives that provide a politically acceptable change in Marsh-wide land uses, such as salt marsh harvest mouse habitat, managed wetlands, public use, and upland habitat. The SMP relies on the incorporation of existing science and information developed through adaptive management.

The Principals are the Service, Reclamation, CDFW, California Department of Water Resources (DWR), National Marine Fisheries Service (NMFS), Suisun Resource Conservation District (SRCD), and CALFED Bay-Delta Program (CALFED). The Principals have consulted with other participating agencies, including the U.S. Army Corps of Engineers (Corps), San Francisco Bay Conservation and Development Commission (BCDC) the Regional Water Quality Control Board (RWQCB), and the State Water Resources Control Board (State Water Board), in developing the SMP.

### 2.2.1 SMP

The SMP is a comprehensive plan that has been designed to address various conflicts regarding the use of Marsh resources, with a focus on achieving an acceptable multi-stakeholder approach to the restoration of tidal wetlands and the management of wetlands and their functions. As such, the SMP

is intended to be a flexible, science-based management plan for Suisun Marsh, consistent with the revised Suisun Marsh Preservation Agreement and CALFED. It also is intended to set the regulatory foundation for future actions within the Marsh. The need for the SMP was based on four major Marsh resources and functions, which are linked directly to the purpose and objective of the SMP EIS/EIR. The resources and functions are listed below.

- **Habitat and Ecological Processes** – Restore lost tidal wetlands by implementing the CALFED Ecosystem Restoration Program Plan (ERPP) restoration target for the Suisun Marsh ecoregion (5,000 to 7,000 acres of tidal marsh) and protecting and enhancing 40,000 to 50,000 acres of managed wetlands.
- **Public and Private Land Use** – Maintain the heritage of waterfowl hunting and other recreational opportunities and increase the surrounding communities’ awareness of the ecological values of Suisun Marsh.
- **Levee System Integrity** – Maintain and improve the Suisun Marsh levee system’s integrity to protect property, infrastructure, and wildlife habitats from catastrophic flooding.
- **Water Quality** – Protect and, where possible, improve water quality for beneficial uses in Suisun Marsh, including estuarine, spawning, and migrating habitat uses for fish species, as well as recreational uses and associated wildlife habitat.

These resources and functions are interrelated and interdependent and, to some extent, objectives of all SMP actions. For example, the restoration of certain properties (i.e., the proposed project) may help to protect or improve water quality; habitat and ecological processes would help to achieve private and public land use objectives. Given these relationships, the SMP is proposed to contribute to meeting each objective in parallel over the 30-year planning period.

## 2.2.2 SMP EIS/EIR

Multiple agencies were involved in preparing the SMP EIS/EIR, including all the Principals. The EIS/EIR evaluated the SMP as the proposed project and documented all potentially significant environmental impacts that could result from implementing the SMP and activities associated with managed wetlands and tidal restoration.

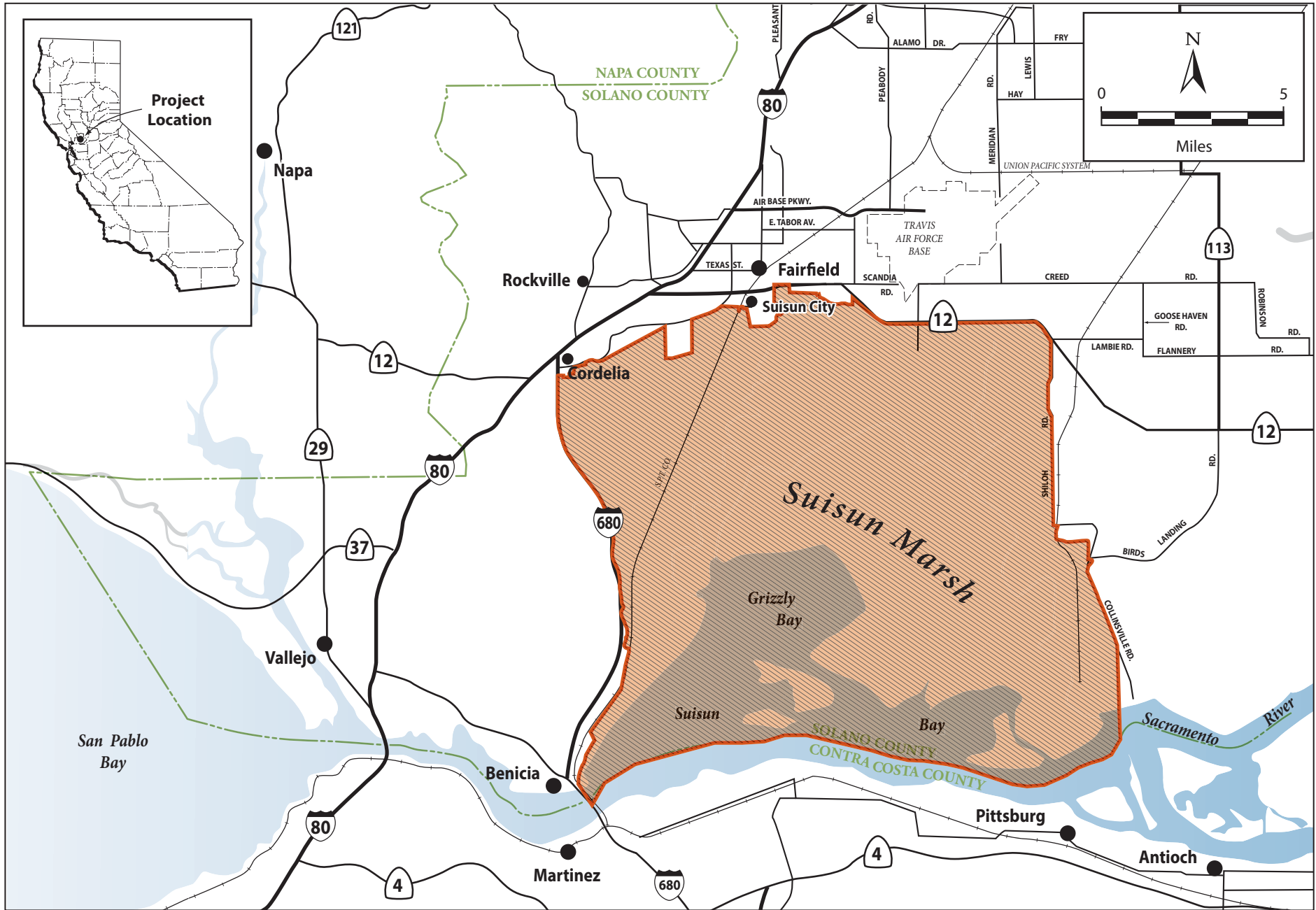
### 2.2.2.1 Agency Involvement

The SMP EIS/EIR describes the agencies involved in preparing the SMP and the SMP EIS/EIR as well as those that are expected to use the SMP EIS/EIR (Chapter 1). These agencies assume roles and responsibilities either through their agency’s authority or through their participation in the National Environmental Policy Act (NEPA) and CEQA process. These agencies include:

- The Service and Reclamation as NEPA lead agencies, responsible primarily for preparing and certifying the EIS.
- NMFS and the Corps as NEPA cooperating agencies, responsible primarily for providing special expertise related to the project and holding jurisdiction over the project.
- CDFW as CEQA lead agency and trustee agency, responsible primarily for preparing and certifying the EIR and managing certain resources that are held in trust for the people of the state of California.

Table 2-1 summarizes additional responsible and trustee agencies.





Graphics ... 34715 (10-15-2015)

**Figure 1**  
**Suisun Marsh Location**



**Table 2-1. Additional Responsible and Trustee Agencies**

Agency	Jurisdiction
<b>Trustee</b>	
State Lands Commission	State-owned "sovereign" lands
<b>Responsible</b>	
California Department of Fish and Wildlife	Streambed alteration and impacts on state-listed species
Office of Historic Preservation	Historic and cultural resources
California Department of Water Resources	Delta Levees Program, SMPA funding, water management facilities
Suisun Resource Conservation District	Managed wetland management
California Air Resources Board	Air quality
Regional Water Quality Control Board (#5)	Pollutant discharges to water bodies
Bay Conservation and Development Commission	Dredging; any development activity that occurs below the 10-foot contour level
Solano County	Construction

SMPA = Suisun Marsh Preservation Agreement.  
Trustee Agency: One that has jurisdiction over certain resources that are held in trust for the people of California but does not necessarily have legal authority with respect to approving or carrying out the project.  
Responsible Agency: One that has responsibility for carrying out or approving the project.

### 2.2.2.2 Impact Analysis

The SMP EIS/EIR provided a programmatic evaluation of the restoration of tidal habitat in the Marsh and associated activities regarding a wide variety of environmental resources. As part of the SMP, environmental commitments were developed, which are to be implemented during restoration activities within the Marsh. These environmental commitments are summarized in Chapter 2 of the SMP EIS/EIR and in Appendix F, *Mitigation Monitoring and Reporting Program*, of the SMP EIR/EIS. A general list is provided below.

- Standard Design Features and Construction Practices
- Limits on Access Points and Staging Areas
- Erosion and Sediment Control Plan Requirements
- Stormwater Pollution Prevention Plans
- Noise Compliance
- Traffic and Navigation Control Plan and Emergency Access Plan
- Recreation Best Management Practices
- Mosquito Abatement Best Management Practices
- Hazardous Materials Management Plans
- Air Quality Best Management Practices

- Visual/Aesthetic Best Management Practices
- Inadvertent Discovery of Cultural Resource Requirements
- Cultural Resources
- Biological Resources Best Management Practices - General Best Management Practices
- Biological Resources Best Management Practices - Worker Training
- Biological Resources Best Management Practices – Special-Status Plant Species
- Biological Resources Best Management Practices - Protection of Special-Status Wildlife Species: Birds
- Biological Resources Best Management Practices - Protection of Special-Status Wildlife Species: Raptors
- Biological Resources Best Management Practices - Protection of Special-Status Wildlife Species: Western Pond Turtle
- Biological Resources Best Management Practices - Protection of Special-Status Wildlife Species: Western Pond Turtle
- Biological Resources Best Management Practices - Protection of Special-Status Wildlife Species: Western Pond Turtle
- Biological Resources Best Management Practices - Protection of Special-Status Wildlife Species: California Least Tern
- Biological Resources Best Management Practices – Special-Status Wildlife Species Protection: Mammals
- Biological Resources Best Management Practices – Special-Status Wildlife Species Protection: California Clapper Rail and California Black Rail
- Biological Monitoring
- Non-Native Plant Control
- Construction Period Restrictions

The SMP EIS/EIR disclosed that impacts on most environmental resources as a result of tidal restoration activities were either less than significant or did not occur (i.e., no impact). To reduce significant impacts to a less-than-significant level, mitigation was incorporated in the SMP EIS/EIR with respect to the effects of restoration activities on two environmental resources, as summarized in Table 2-2. It was determined that restoration activities could significantly and unavoidably affect known and as-yet-unidentified cultural resources by damaging or destroying them. Although mitigation measures are included in the SMP EIS/EIR (as summarized in Table 2-2), it was determined that the measures would not reduce the impact to less than significant

**Table 2-2. Resources Requiring Mitigation**

Resource	Mitigation in the SMP EIS/EIR
Air Quality	AQ-MM-1: Limit Construction Activity during Restoration AQ-MM-2: Reduce Construction NO <sub>x</sub> Emissions AQ-MM-3: Implement All Appropriate BAAQMD Mitigation Measures AQ-MM-4: Limit Construction Activity during Restoration and Management
Cultural Resources	CUL-MM-1: Document and Evaluate the Montezuma Slough Rural Historic Landscape, Assess Impacts, and Implement Mitigation Measures to Lessen Impacts CUL-MM-2: Evaluate Previously Recorded Cultural Resources and Fence NRHP- and CRHR-Eligible Resources prior to Ground-Disturbing Activities CUL-MM-3: Protect Known Cultural Resources from Damage Incurred by Inundation through Plan Design (Avoidance) CUL-MM-3: Protect Known Cultural Resources from Damage Incurred by Inundation through Plan Design (Avoidance) CUL-MM-4: Resolve Adverse Effects prior to Construction CUL-MM-5: Conduct Cultural Resource Inventories and Evaluations and Resolve Any Adverse Effects
Utilities and Public Services	UTL-MM-1: Relocate Overhead Power Lines or Other Utilities that Could Be Affected by Construction UTL-MM-2: Avoid Ground-Disturbing Activities within Pipeline Right-of-Way UTL-MM-3: Relocate or Upgrade Utility Facilities that Could Be Damaged by Inundation UTL-MM-4: Test and Repair or Replace Pipelines that Have the Potential for Failure

NO<sub>x</sub> = nitrogen oxides; BAAQMD = Bay Area Air Quality Management District

## 2.3 Proposed Project

This section provides a summary of the location and a description of the proposed project, including its relationship to the SMP EIS/EIR and the CEQA objectives of the proposed project.

Westervelt Ecological Services (WES) is developing the proposed project on behalf of SFCWA. The proposed project is adjacent to Grizzly Bay, within the Suisun Marsh of Solano County, California. It would restore approximately 420 acres of existing managed brackish wetlands to tidal habitat, which would directly benefit federally and state-listed delta smelt, longfin smelt, and salmonids. The proposed project would introduce full daily tidal exchange to existing managed marsh habitat owned by WES and CDFW. The proposed project is consistent with the SMP and the evaluation in the SMP EIS/EIR.

Table 2-3 summarizes the consistency of the proposed project with the SMP's purpose and objectives.

**Table 2-3. Proposed Project Consistency with Suisun Marsh Plan Purpose and Objectives**

Suisun Marsh Plan Purpose and Objectives	Proposed Project
Habitats and Ecological Processes—Implement the CALFED ERPP restoration target for the Suisun Marsh ecoregion (5,000 to 7,000 acres of tidal marsh) and protect and enhance 40,000 to 50,000 acres of managed wetlands.	The proposed project would restore approximately 420 acres of tidal marsh and tidal channel habitat.
Public and Private Land Use—Maintain the heritage of waterfowl hunting and other recreational opportunities and increase the surrounding communities’ awareness of the ecological values of Suisun Marsh.	The proposed project would maintain the heritage of waterfowl hunting. Tidal areas below the ordinary high-water mark are public access areas. Additionally, the Grizzly Island Wildlife Area may run hunting through its reservation system.
Levee System Integrity—Maintain and improve the Suisun Marsh levee system integrity to protect property, infrastructure, and wildlife habitats from catastrophic flooding.	The proposed project design has been reviewed for levee system integrity, including protection of the Roaring River Distribution System and incorporation of a habitat berm to protect the managed wetlands on the east side of the site.
Water Quality—Protect and, where possible, improve water quality for beneficial uses in Suisun Marsh, including estuarine, spawning, and migrating habitat uses for fish species, as well as recreational uses and associated wildlife habitat.	The proposed project design is being modeled to protect water quality.

The proposed project also promotes the restoration of tidal wetlands, as discussed in the SMP EIS/EIR and as follows:

- It consists of converting managed wetlands to tidal wetlands, channels, tidal pannes, and transitional habitat
- It will contribute to the recovery of special-status species, including the delta smelt, longfin smelt, salt marsh harvest mouse, and clapper rail
- It has a sufficient sediment budget and appropriate elevations for accommodating sea level rise
- It has proximity to open-water habitats that provide connections to other habitats
- It will provide food-web support to native fish through the production and export of phytoplankton, zooplankton, and benthic invertebrates

### 2.3.1 Proposed Project Objectives

The proposed project would partially fulfill the 8,000-acre tidal restoration obligations of the Fish Restoration Program Agreement (FRPA), satisfying the requirements of the Service’s 2008 Biological Opinion for Delta Smelt, the 2009 NMFS Biological Opinion for the Coordinated Operations of the State Water Project (SWP) and the Federal Central Valley Project (CVP), and the Longfin Smelt Incidental Take Permit for the SWP. The proposed project is also identified as a priority restoration project under the California EcoRestore program.

The objectives of the proposed project are:

- Enhance regional food-web productivity and export to Grizzly Bay in support of delta smelt and longfin smelt recovery
- Provide rearing habitats for out-migrating juvenile salmonids
- Provide rearing, breeding, and refugia habitats for a broad range of other aquatic and wetland-dependent species that utilize or depend on the combination of brackish aquatic/tidal marsh habitat
- Provide ecosystem functions associated with the Delta brackish aquatic, tidal marsh, and upland interfaces that these species required
- Provide topographic variability to allow for habitat succession and resilience against future climate change and sea level rise

## 2.3.2 Location

The property on which the project is proposed is currently, and has been historically, managed as the Tule Red Duck Club. It is located in SMP Region 4 of the Marsh. The vast majority of the project site is managed marsh, with a small area of tidal marsh at the northern end of the project site and along the bayside margin of the existing natural berm. The upper limit of the natural berm is approximately 6 feet in elevation and located on the western edge of the property; daily tidal sediment accretion occurs along the berm. The project site gradually slopes eastward to an elevation of 3 to 4 feet; the eastern boundary is defined by levees established for water management on the adjacent Grizzly King Duck Club and Grizzly Island Wildlife Area. A majority of the project site is now disconnected from daily tidal influence, and water levels are managed on a seasonal basis. Upland habitat is located along the uppermost tops of the adjacent levees. A water supply and drainage channel parallels the levee on the eastern boundary of the project site, and this channel connects to the bay on both the north and south end through dual combination flap gate water control structures. Water elevations and site drainage are managed through these tide gates, the channel, and numerous internal distribution ditches. The project site is typically kept flooded at a stable water level from October to February for duck hunting, then repeatedly drained and re-flooded through the spring to leach salts from the soil, and is then fully drained through summer and early fall for disking, mowing, and any maintenance of ditches or water control levees and structures. Figure 2 shows the proposed project location within Suisun Marsh, and Figure 3 shows the project area.

## 2.3.3 Description

The proposed project would restore approximately 420 acres of existing managed wetlands to tidal habitat. The proposed project would be designed to be a naturally self-regulating system that would not require active management or intervention, which is the intent of the SMP for restoration projects. The proposed project would provide four primary habitat features: 1) a breach of the natural levee at the northern part of the project area to allow for full daily tidal exchange through the interior of the project site, 2) a network of distribution channels to convey water across the marsh plain, 3) a series of tidal pans and basins to retain water for periods of up to 2 weeks and maximize aquatic food production, and 4) a continuous habitat berm along the eastern perimeter of the property to provide a more gradual transition from marsh to upland habitat and maintain the existing levels of flood protection for adjacent properties.

Figure 4 shows the conceptual plan for the proposed project, and Figures 5a and 5b show a cross section of the proposed habitat berm. The four habitat features would support the interrelated resources and functions described in the SMP.

The proposed project would support approximately 460 acres of tidal wetlands and associated jurisdictional habitats and approximately 18 acres of uplands (compared with approximately 54 acres of existing tidal wetlands and 10 acres of uplands). This would represent a gain in tidal wetlands of approximately 334 acres. Implementation of the proposed project would result in a permanent net loss of approximately 7.5 acres of wetlands or other waters of the United States. The proposed project would also include demolishing several existing structures within the project site and removing the on-site northern and southern water control structures, as well as modifying the existing CDFW drain to improve dissolved oxygen (DO) on the project site. Figure 6 shows the location of the existing CDFW drain and other water control structures on the project site.

The existing CDFW drain outfall allows CDFW to pump discharged drain water from the managed wetlands of the Grizzly Island Wildlife Area onto the project site. WES has collected continuous water quality data using in situ monitors at this location; during certain conditions, the discharge water has low DO levels. When this water is concentrated in channels, it has the potential to negatively affect aquatic life. The proposed project includes two approaches for resolving the low DO levels: retrofit the existing outlet pipe or construct a pooling area. Retrofitting the existing drainage pipe would consist of fitting a spray aeration device on the existing pipe to aerate water as it drains and increase the DO levels. Constructing a pooling area would consist of excavating an area around the existing pipe to control discharges of CDFW drain water onto the project site. As part of this approach, WES would conduct continuous water quality monitoring using in situ monitors to determine the effectiveness of the spray aeration fitting. The water would be retained or discharged, depending on tides and the DO content of the drain water.

The proposed project would incorporate the appropriate environmental commitments (or equivalent measures) and mitigation measures, as identified in the SMP EIS/EIR (Section 2.5, *Environmental Commitments and Mitigation Measures*) and Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*.

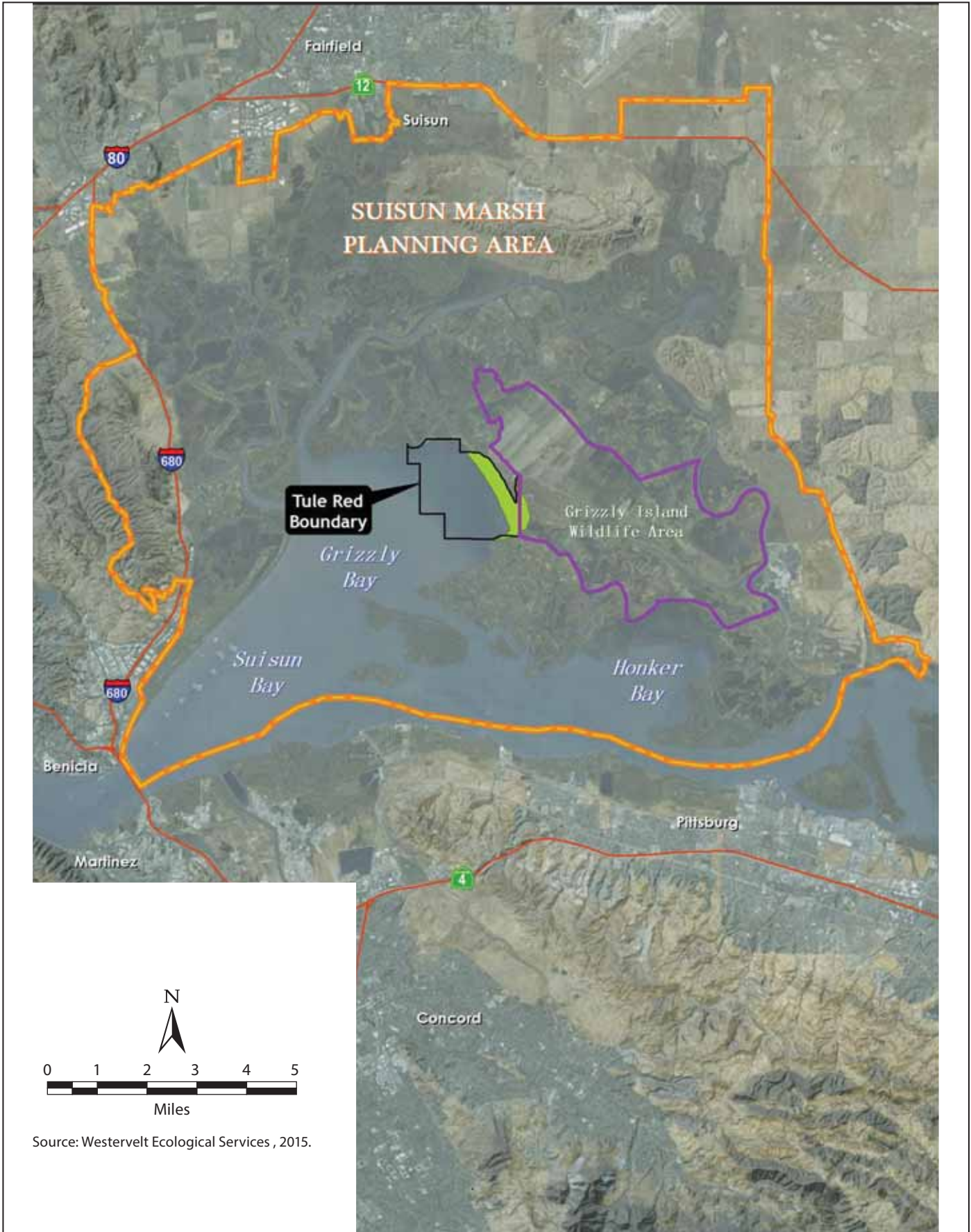
## 2.4 Construction

The proposed project would restore the project site to tidal wetlands. Construction activities to restore the project site, including phasing, scheduling, and the workforce and equipment required are described below.

### 2.4.1 Phasing and Schedule

This section describes the proposed phasing and schedule, workforce and equipment required, and activities that would occur during the two phases of construction to restore the existing managed wetlands to tidal habitat. Phase 1 would consist of site preparation, grading, revegetation, and associated activities on the land side of the natural berm, including modification of the CDFW drain. After Phase 1 is complete, the project site would be managed for 1 to 2 years to revegetate the disturbed soils and thereby minimize potential erosion during the subsequent Phase 2 when the site would be exposed to tidal action. Phase 2 would consist of demolishing several on-site structures and breaching the natural berm to restore tidal action to the project site.

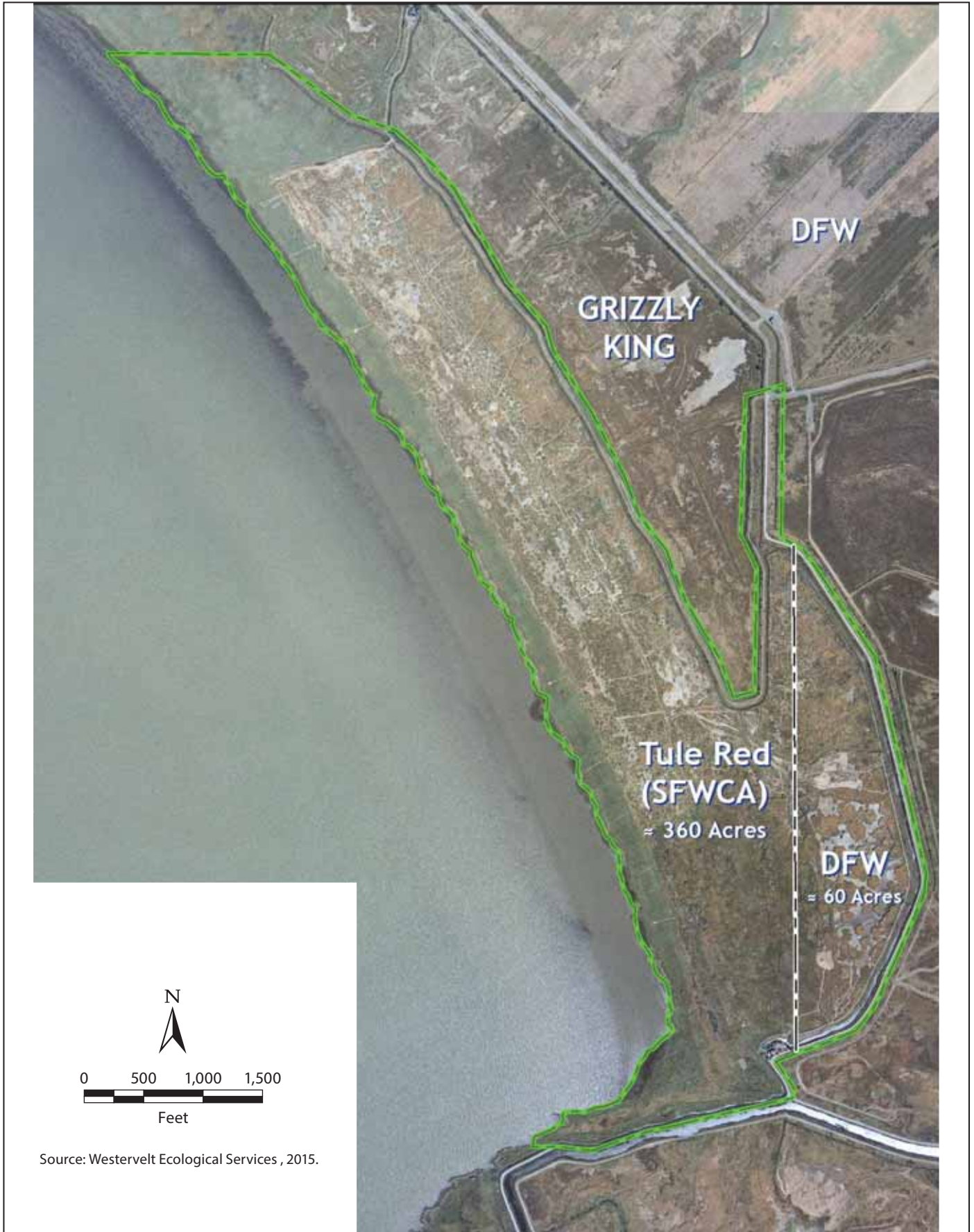




**Figure 2**  
**Proposed Project Location**

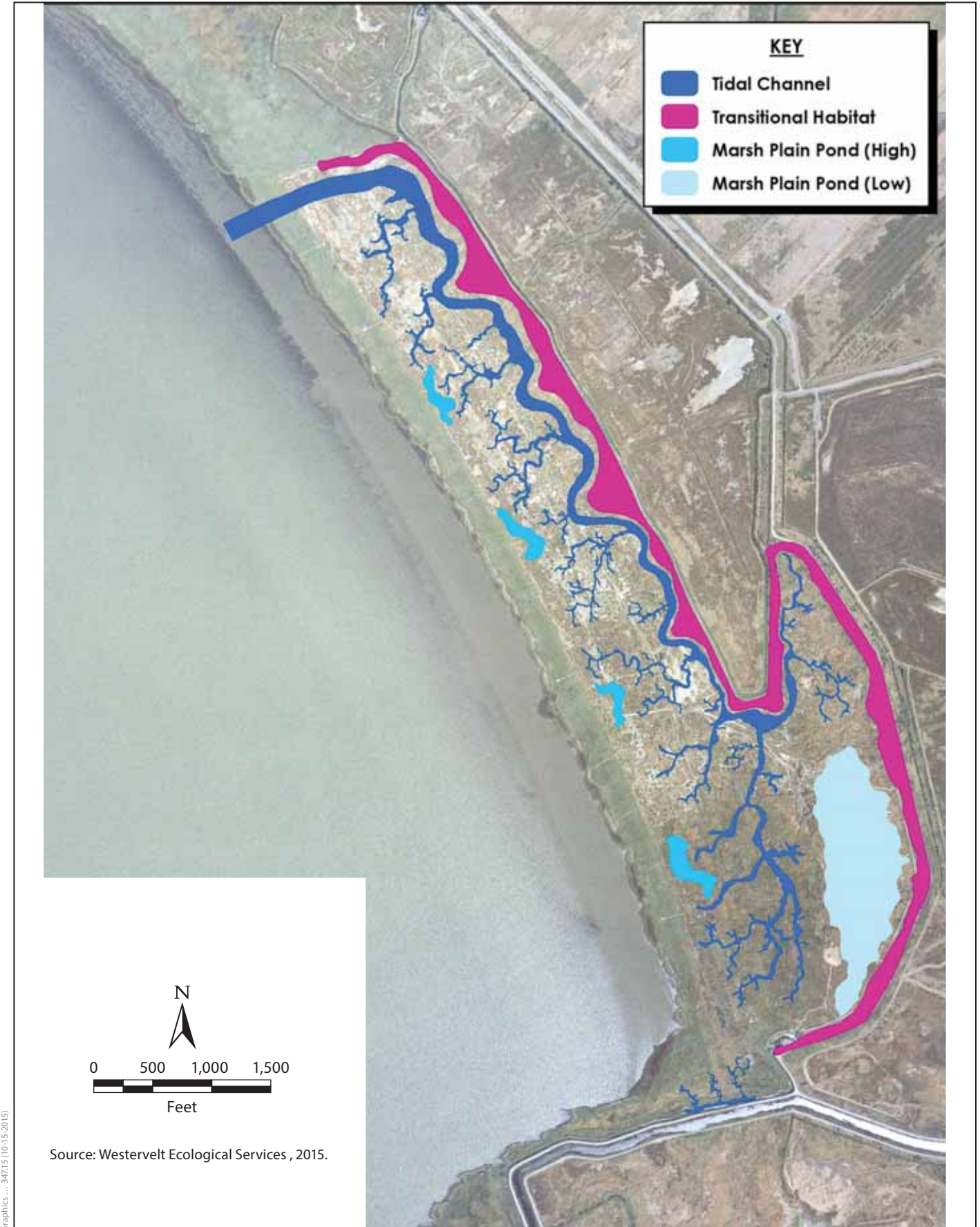
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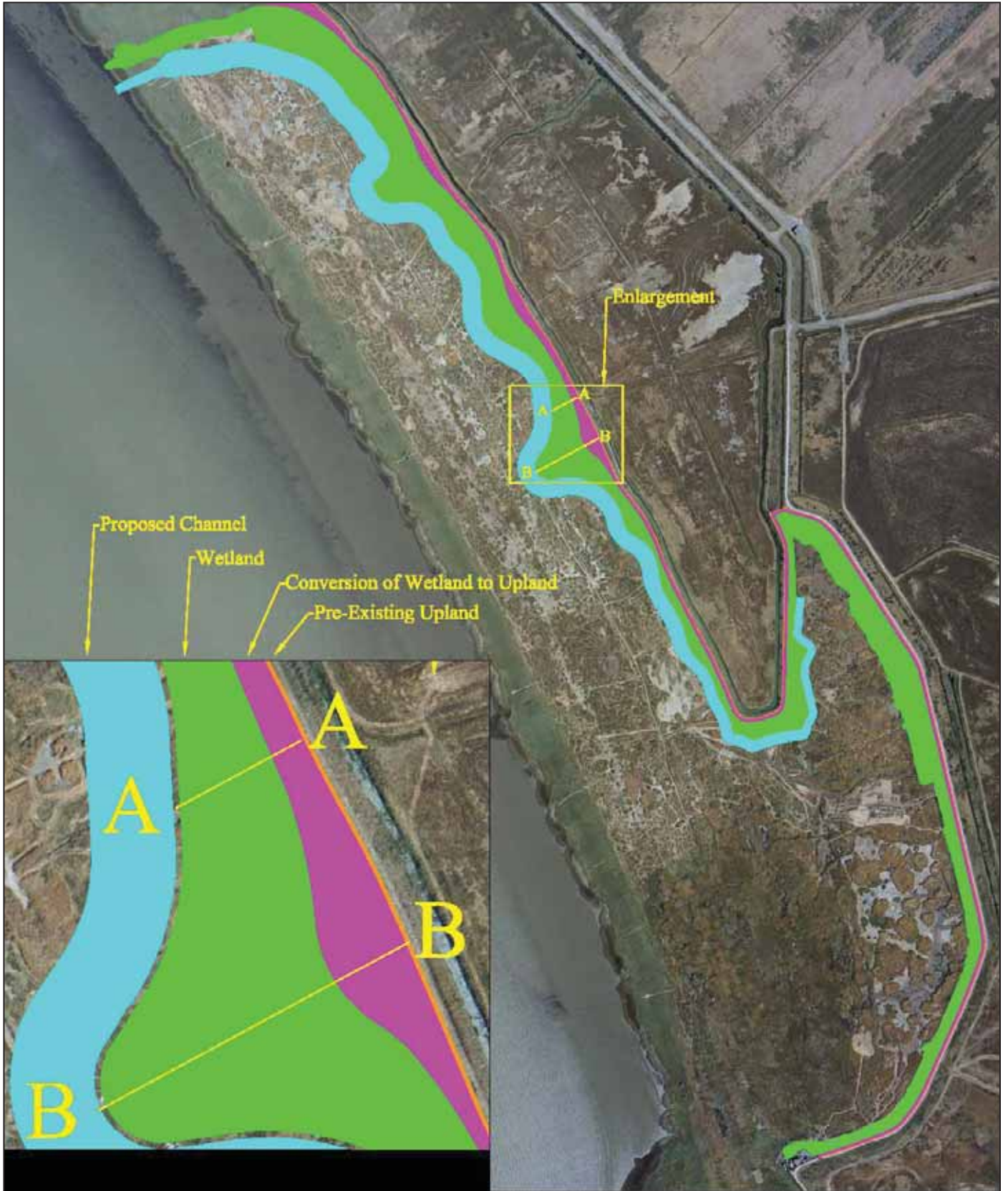
**Figure 3**  
**Proposed Project Area**





**Figure 4**  
**Concept Plan**



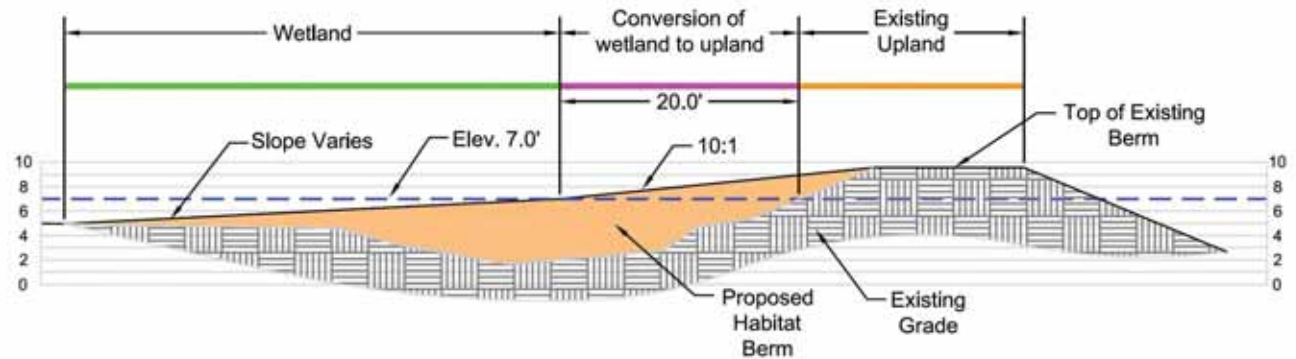


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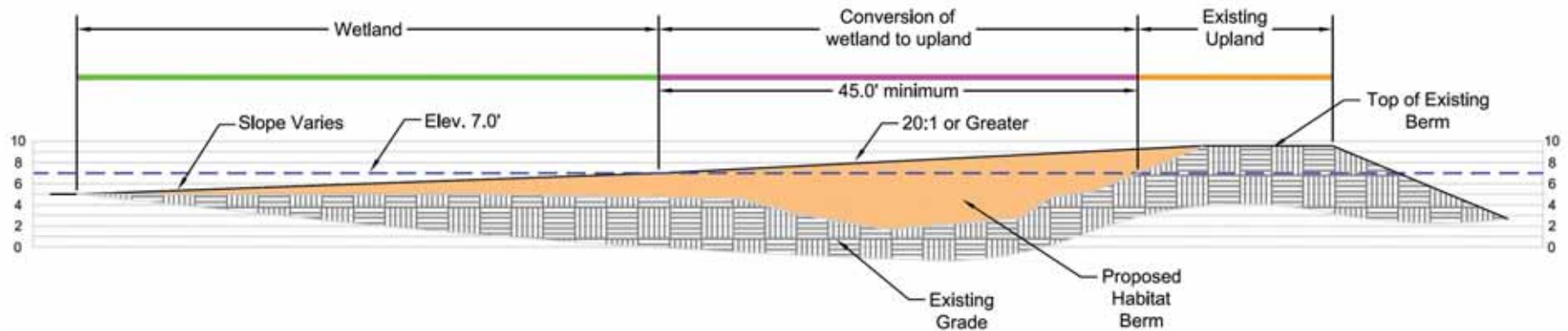
Figure 5a  
Habitat Berm







10:1 - Proposed Habitat Berm  
Section A - A

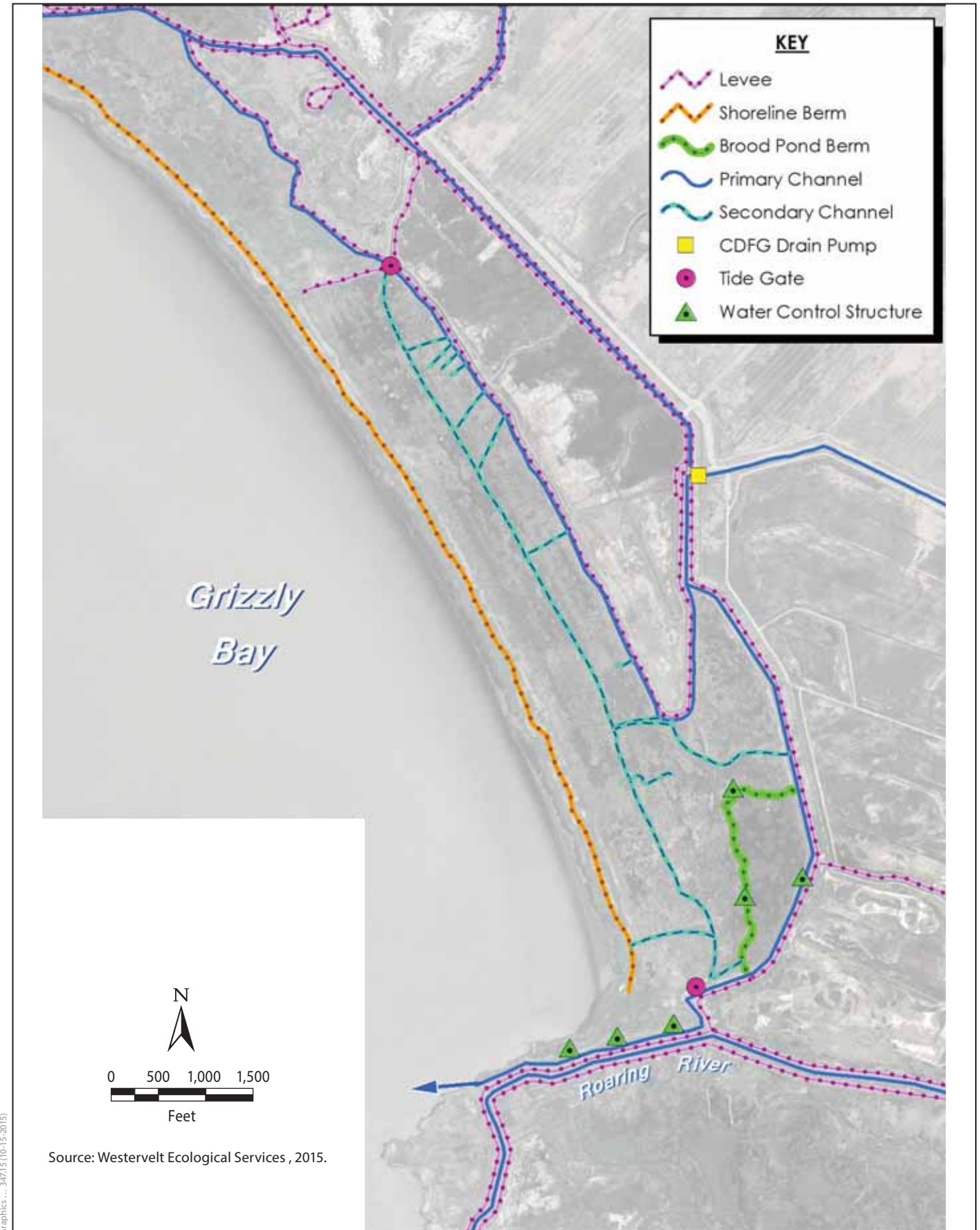


20:1 or Greater - Proposed Habitat Berm  
Section B - B

Source: Westervelt Ecological Services, 2015.

Figure 5b  
Cross Section View of Habitat Berm





**Figure 6**  
**Existing Water Management Infrastructure**



Phase 1 is scheduled to begin in 2016, pending receipt of project approvals, associated permits and authorizations, and funding. All construction activities would occur on the managed marsh portion of the site and landward of the existing natural berm. Depending on soil conditions within the site and when permits are issued, work could start as early as June 1 and may continue until October 15 or the onset of the rainy season. Depending on permit requirements and allowable hours of operation, shift work and/or weekend work may take place. However, given potential working conditions and the different activities that would need to occur on any given day, it is reasonable to assume for the purposes of analysis that work would typically occur 8 to 10 hours a day, 5 days a week, for an estimated duration of 40 to 80 working days under Phase 1.

Phase 2 construction is scheduled to occur in 2017 or 2018 and would consist of demolishing several on-site structures, removing the two existing water control structures (combination gates and bulkheads), and excavating the primary tidal channel through the bayside berm out into the mudflats to allow for tidal exchange. Depending on permit requirements and allowable hours of operation, shift work and/or weekend work may take place. However, given potential working conditions and the different activities that would need to occur on any given day, it is anticipated work would typically occur 8 hours a day, 5 days a week, for a period of 50 working days within a 3-month timeframe under Phase 2. Demolishing the on-site structures would generally occur between the beginning of September and middle of October. Demolition would occur prior to the breach and removal of the water control structures, and would take several weeks to complete. In-water activities related to breaching the exterior natural berm would be conducted during the months of September through November and take approximately 1 week to complete. Removal of the two water control structures would take approximately 2 weeks. The timing of all Phase 2 in-water activities would be consistent with the special-status fish species work windows (September 1 through November 30 for delta smelt and August 1 through November 30 for salmonids).

#### 2.4.1.1 Workforce and Equipment

Temporary construction staffing for the proposed project would consist of approximately 10 to 20 personnel during Phase 1 and fewer personnel during Phase 2. Contractors working on-site would be properly trained and certified for construction activities, best management practices, and recognizing special-status plants and animals that may be encountered during construction.

Restoration of the project site would require many different equipment types. Conditions in the field at the time of construction would influence the type of equipment that would be best suited for the work and ultimately would be chosen by the construction contractor. Equipment would be delivered to the project site by flatbed truck and transported to the work areas via existing access roads.

Six different types of equipment are anticipated to be used through the duration of Phase 1 (40 to 80 working days). The mix and number of pieces of equipment that would actually be used would depend on the activities that would occur within the phase and the conditions of the project site. The following types of equipment are expected to be used during Phase 1: scraper, dozer, excavator, grader, backhoe, front-end loader, and dump truck/water truck. All scrapers, dozers, and excavators (e.g., the high horsepower equipment) used during Phase 1 would have a Tier 3 engine or greater.

Five different types of equipment are anticipated to be used through the duration of Phase 2 (50 working days). The mix and number of pieces of equipment actually be used would depend on the activities that would occur within the phase and the conditions of the site. The following types of equipment are expected to be used during Phase 2: dozer, excavator, backhoe, front-end loader, and

dump truck/water truck. Dump trucks would be required for hauling away debris generated through the demolition of the structures. All scrapers, dozers, and excavators (e.g., the high horsepower equipment) used during Phase 2 would have a Tier 3 engine or greater.

### 2.4.1.2 Phase 1

Phase 1 consists of site preparation, earthwork, modification of the CDFW drain, and site stabilization. Only the site preparation, earthwork, and the second component to modifying the CDFW drain would require active construction and construction equipment. Site stabilization includes seeding and mulching the upland areas and managing water to facilitate revegetation within the marsh interior prior to breaching the exterior natural berm. Phase 1 work would be conducted on the WES parcel and the CDFW parcel at the same time. As described in Section 2.4.1, *Phasing and Schedule*, Phase 1 is scheduled to begin in 2016, pending receipt of project approvals, associated permits and authorizations, and funding.

#### Site Preparation

Several site preparation activities would occur on-site as part of Phase 1. These activities are either currently occurring on-site and part of baseline management or would be part of the proposed project to prepare the site for Phase 2. Site preparation activities that are not part of baseline management include improving existing access roads and setting up a construction management center and equipment staging area(s), including a location for managing hazardous materials. Figure 7 shows the approximate location of staging areas. Site preparation activities that are currently part of baseline management include the removal of vegetation. The total footprint of all excavations, staging areas, access roads, and fill areas, including buffers, is approximately 150 acres.

Prior to earthwork, the site would be prepared by clearing existing vegetation, using standard practices that are currently used for managed wetlands within Suisun Marsh and have been used on the project site. Biologists would conduct pre-construction surveys for special-status species before vegetation clearing to ensure no listed species are present, as described in SMP EIS/EIR Section 2.5, *Environmental Commitments and Mitigation Measures*, and Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*. Vegetation removal would first be accomplished by using mowers towed behind wheeled tractors and bulldozer tractors, as used under baseline conditions. Depending on the slope, an articulated arm powered by an excavator may be used to remove vegetation. These methods diverge from the covered action of hand removal of salt-marsh harvest mouse habitat (i.e., pickleweed) in the SMP U.S. Fish and Wildlife Service (USFWS) Programmatic Biological Opinion (BO); however, as described in Chapter 3, *Environmental Analysis*, the SMP EIS/EIR and USFWS BO allow modification of the methods approved by the resource agencies.

Existing levee roads would be utilized to access the project site from Grizzly Island Road. Equipment travel routes and excavated material transport would occur primarily along temporary access roads within the cut-and-fill footprint of the project. The final decision on access and haul routes would be reached through collaboration among the contractor and design team, in compliance with applicable regulatory permitting requirements, prior to construction.

Approximately four staging areas and one Construction Management Center (CMC) would be established to support project implementation. Each staging area would be approximately 1 acre in size; the CMC would be established at an existing gravel parking lot and also measure approximately 1 acre. Because the temporary staging areas would be located within the habitat berm footprint, they would be covered over successively by fill as work moves along the length of the project.



**Figure 7**  
**Proposed Project Area Staging and Access**





## Earthwork

Earthwork (grading, excavation, and redistribution of material) would be necessary to construct the tidal channel network, create a series of tidal pannes and basins, and construct the habitat berm. Prior to earthmoving, the topsoil layer (less than 6 inches) with detritus from mowing, would be stripped back by bulldozer with blade and stockpiled in the construction areas. This would be used later as mulch for exposed mineral soils. Grading includes excavating tidal channel networks and basins throughout the site and transporting excavated materials to construct the habitat berm. Equipment utilized may include a scraper, bulldozer, excavator, and grader.

Overall, grading for the new tidal channels and depressions would require excavation of up to 300,000 cubic yards of soil within 150 acres of the project site. The proposed project is designed as a balanced cut-and-fill project. For the purposes of this analysis, no soil would be brought to the site or hauled off the site. Material excavated from the primary tidal channel (and from the tidal pannes and basins) would be transported within the project site to construct the habitat berm, which would have a gradual and varying slope (10:1 to 50:1); primarily wetland vegetation would be grown on the berm. Material would be picked up and transported within the project site, then spread with a variety of equipment, depending on the moisture content of the material and the haul distance within the project site. Additionally, some of this excavated material would first be used to improve and/or construct staging areas and haul routes throughout the project site. Material excavated from the lower order tidal channels would be side cast in a diffuse pattern or mounded in the area immediately surrounding the channel network, allowing wetland vegetation to colonize the spoils within a single growing season.

## Modifying CDFW Drain

WES would implement an approach to improving the low DO experienced at the CDFW drain. This would involve two components: (1) installation of a spray aeration structure on the existing outlet pipe and (2) constructing a pooling area. WES would retrofit the existing drain outlet pipe where it enters the Tule Red property with a spray aeration fitting, engineered to bring the DO in the drain discharge water to within ecologically acceptable tolerances. WES would conduct continuous downstream water quality monitoring using in-situ monitors. Retrofitting the existing outlet pipe of the CDFW drain pump with a spray aeration structure would require no earthwork or construction equipment. Additionally, a pooling area would be constructed to control the discharge of the CDFW drain water into the restoration area. The new pooling area would be created downstream of the existing discharge by constructing a new crossing between the two existing levees. The crossing would include a new water control structure that would allow water to be retained within the pooling area or discharged into the restoration site, depending on tides and DO content of the drain water. This would allow water to be released upon outgoing tides, ensuring a well-mixed water column and eliminating any low DO concentrations. This component would require construction of a road, approximately 10 feet wide, to connect both levees. The amount of fill associated with the road and levee would be less than 0.1 acre (Figures 8a–8c show the locations of the new road crossing and levee cross sections). Construction of the road and levee would be included in all permit applications. Implementation of the second alternative would require the construction equipment described in Section 2.4.1.1, *Workforce and Equipment*.

## Site Stabilization

Upon completion of grading and excavation of marsh plains and tidal channels but prior to construction of the tidal connection, the site would be managed for 1 to 2 years to encourage revegetation and soil stabilization. Land management activities during the site stabilization period would include vegetation management, *Phragmites* control, and the installation of tules and other plants to help establish native vegetation on the site. These land management activities the same as the land management activities associated with managed marshland management activities for wetland maintenance activities within Suisun Marsh. Land within the project restoration area would continue to rely on RGP 3 authorization for land management activities until the site is breached, or approximately 1 to 2 years after project initiation.

### 2.4.1.3 Phase 2

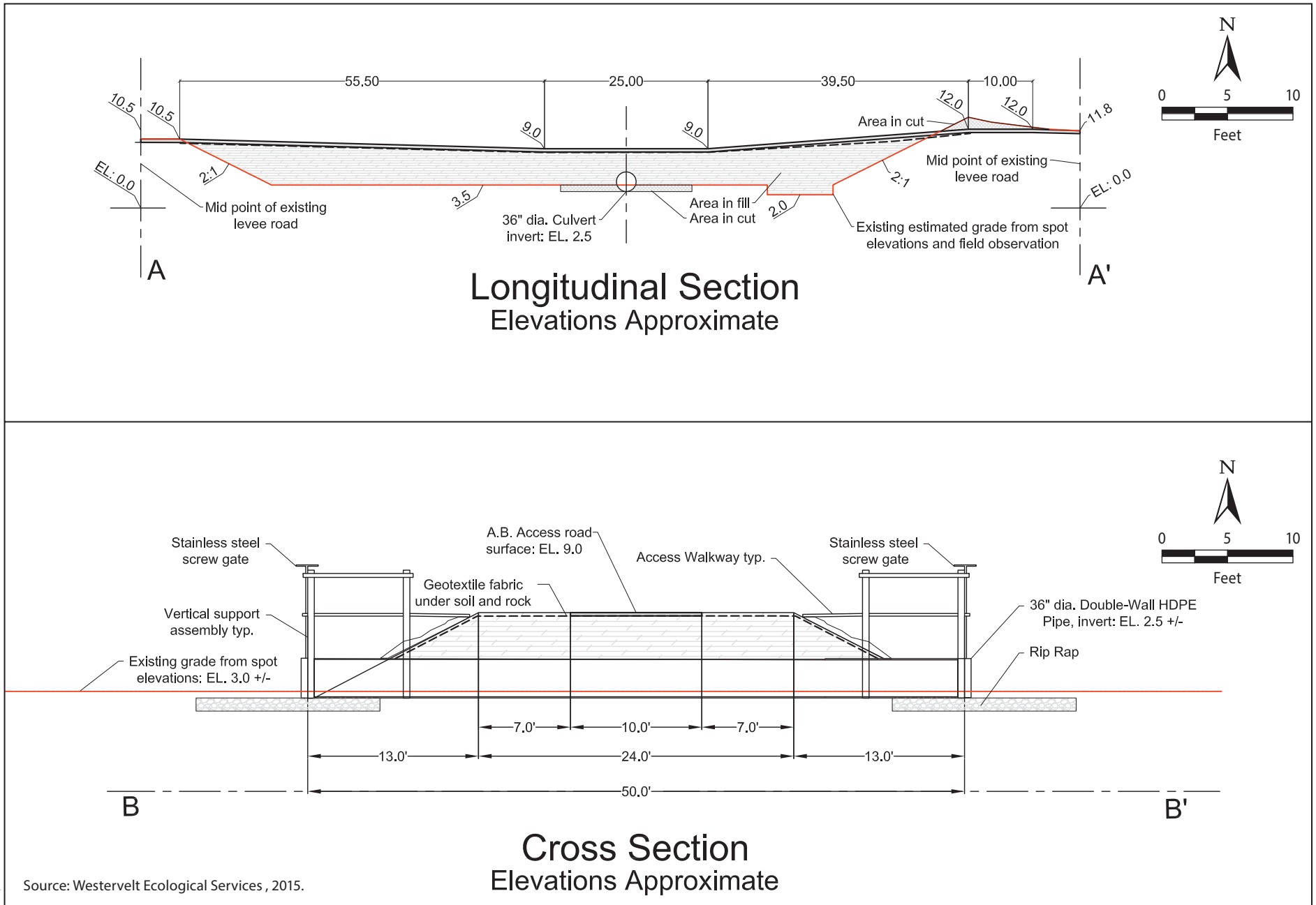
Phase 2 consists of demolishing several onsite structures and then breaching the natural berm and removing the north and south water control structures. As described in Section 2.4.1, *Phasing and Schedule*, Phase 2 is expected to occur in 2018, but could occur earlier (2017), depending on vegetation establishment and invasive species management.

## Demolition of Structures

Existing structures, including the current duck club residence, shop areas, and viewing platform, would be demolished as part of Phase 2, prior to breaching the existing natural berm. The use of the project site has changed over time, and activities that were dependent on these structures no longer occur at the project site or in the buildings; therefore, the buildings would be demolished because they are no longer in use. Five existing structures, totaling approximately 3,600 square feet, would be demolished. These structures are primarily constructed of wood, and while there is no known history of bat use, there is a history of birds nesting on the structures. As such, pre-demolition surveys would be required prior to the demolition to ensure no bat or migratory bird presence. These pre-demolition surveys would be conducted by a qualified biologist, and would occur up to 3 days prior to demolition. This type of survey is similar to those pre-construction surveys required for various species in the SMP EIS/EIR and as described in Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*, and would occur in conjunction with nesting bird surveys. Windows and doors of the structures would be kept closed and sealed prior to demolition through the summer to prevent bats, migratory birds, or other species from inhabiting or roosting in the interior of the structures. Debris piles, material stored in and around the buildings, decorative panels and building furnishings will be removed prior to the preconstruction survey to ensure full survey access. If no live bats or sign (e.g., guano, staining, prey remains, bat carcasses) are found, and if no nests of protected bird species are active on or within the existing structures the structures may be demolished at any time. If live bats or indications of bat use are found, or if active protected bird nests are found, the demolition of the structures would be limited to the beginning of September to the middle of October, at which time the survey procedure described would be repeated, and demolition would be postponed until colonial bats or special status bats are evicted or leave of their own volition. Demolition would take several weeks prior to breaching the natural berm. Much of the work would be done by hand and some materials (i.e., wood) would be salvaged. It would require the same type of equipment used for breaching the existing natural berm (i.e., excavator, backhoe, dump truck, and grader) as described in Section 2.4.1.1, *Workforce and Equipment*. Less than 20 dump trucks (approximately 40 trips) would be required over a period of several weeks.

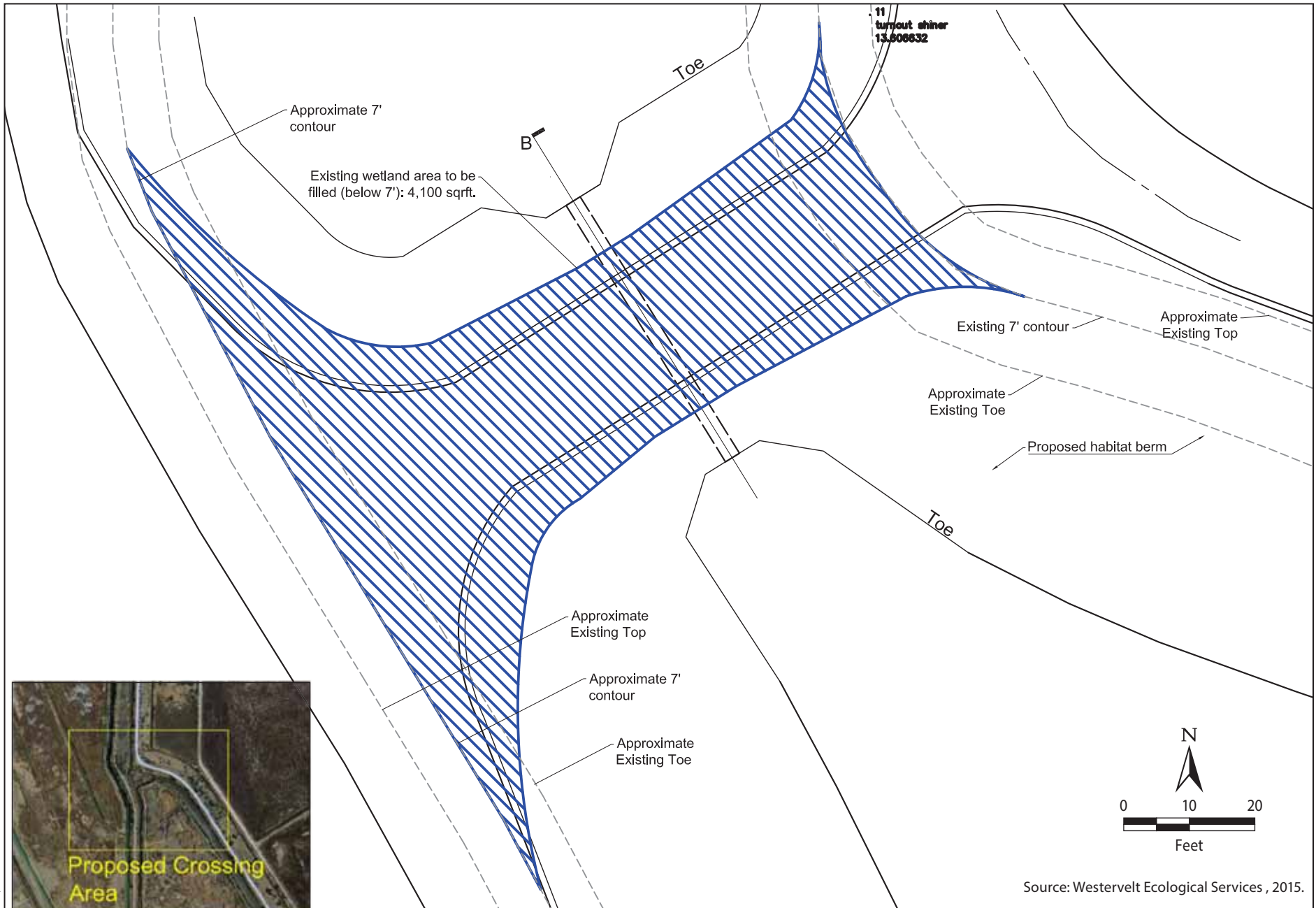






**Figure 8b**  
**Tule Red Proposed Levee Sections**





**Figure 8c**  
**Tule Red Proposed Levee Crossing Impacted 404 Area**





## Breach of the Natural Berm

A permanent tidal connection would be established during Phase 2 by breaching the existing natural berm on the project site to allow for full daily tidal exchange through the interior of the project site. The breach would occur approximately 1 to 2 years after the creation of habitat features (i.e., tidal channel network, a series of tidal pannes/basins, habitat berm) and site stabilization efforts.

The breach would be constructed by a long-reach excavator operating from the edge of the created channel. Side-cast material from the breach would be placed along the habitat berm. The breach would be conducted during low tide of a neap tidal cycle so that the first tidal action occurring from the breach would deliver any loose sediments into the site (on a rising tide) and not deliver them into Grizzly Bay. This would minimize initial sediment scour. Complete construction of the breach would take a maximum of 5 days. The breach would be approximately 50 feet wide and located at the north end of the project site. By maintaining isolation between the restoration area and Grizzly Bay during the first phase of construction (i.e., not breaching the levee during early project phases), the work area would remain as dry as possible during earthwork. This method would minimize impacts on aquatic organisms and the transport of silt and construction debris/contaminants into adjacent waterways. In addition, the existing north and south water control structures would be removed from the project site under Phase 2. This would take approximately 14 days and require several pieces of equipment, including an excavator, backhoe, dump truck, and grader.

## Site Restoration

The temporary staging areas would all be located within the habitat berm footprint and, as such, covered over successively by the habitat berm as work moves along the length of the project from north to south. The habitat berm would be seeded following completion.

The CMC and the access road to the clubhouse area (existing gravel road) would receive a top dressing of gravel at project completion, returning them to pre-project conditions. The levee roads would receive a final top dressing of fill at the very end of the project to bring their elevations to pre-project elevations and compensate for any settling or compaction from vehicle travel during the construction phase. The levee road between Tule Red and Grizzly King will be seeded with a mix of perennial and annual native and naturalized grasses.

## 2.5 Project Site Monitoring and Management

The project would use an adaptive management approach with objective-driven monitoring as intended by the SMP (Appendix E, *Adaptive Management and Monitoring Plan*, of the SMP EIS/EIR). Pre-construction monitoring would take place for one to two years prior to breaching (pre-breach conditions). Post-breach monitoring would occur during the first five years after breaching (Interim Management Period) for at least three of the five years (e.g., Year 1, 3, and 5). The effectiveness monitoring program would be periodically evaluated during the first few years and adjustments would be made as necessary, based on interim findings and feedback on methods. Monitoring metrics would address physical habitat, hydrological regime and water quality, vegetation, aquatic food web (primary and secondary producers), fish community, and wetlands and vegetation. The actual schedule and sampling design (location and number of sampling sites and events) would be tailored to the project needs prior to construction, and in coordination with IEP and other regional monitoring programs. Fish monitoring would be coordinated with regional monitoring by IEP and UC Davis Suisun Marsh Fish Study, and other agency programs.

Once the project site is restored, habitat establishment would occur, starting in approximately 2018. Limited maintenance, monitoring, and management tasks would occur during this time, including development of tules and other native marsh vegetation, weed control within the habitat berm, inspection of erosion or settling with respect to habitat level, and patrolling for trash and trespass. Long-term management of the project area would begin once the habitat berm vegetation is established. Long-term management would include all habitat establishment activities, periodic biological monitoring of the project area, and periodic mapping of the marsh and channel. The breach location is expected to reach equilibrium at a width of approximately 120 feet during this time.

Ultimately, SFCWA is proposing a transfer of the project site to CDFW to be managed as part of the Grizzly Island Wildlife Area. CDFW would manage the restored property in perpetuity as part of the Grizzly Island Wildlife Area. Public access would be regulated through the Grizzly Island Wildlife Area public use plan.

## 2.6 Environmental Commitments and Mitigation Measures

The proposed project would incorporate the environmental commitments summarized in Chapter 2 and Appendix F, *Mitigation Monitoring and Reporting Program*, of the SMP EIS/EIR, where appropriate. In addition, the proposed project would incorporate applicable mitigation measures for air quality summarized in Table 2-2 of this chapter and identified in Appendix F of the SMP EIS/EIR. As such, Appendix B, *Tule Red Restoration Environmental Commitments and Mitigation Measures*, of this document describes all applicable and appropriate environmental commitments and mitigation measures for the proposed project. These environmental commitments and mitigation measures are then referenced and described in the impact analysis in Chapter 3, *Environmental Impact Analysis*, of this document.

## 3.1 Introduction

This chapter examines the changes to the environmental setting (where appropriate), evaluates the potential changes to environmental impacts, and identifies whether the impacts of the project modifications fall within the scope of the previously certified *Final Suisun Marsh Habitat Management, Preservation, and Restoration Plan Environmental Impact Statement/Environmental Impact Report* (SMP EIS/EIR) with respect to implementing the Tule Red Restoration Project (proposed project). This chapter is organized such that it provides a summary of the impact conclusions first in Section 3.2, *Impact Conclusions*, and then provides specific resource analysis.

## 3.2 Impact Conclusions

The proposed project, as well as the analysis contained within this addendum, would not result in any new significant environmental effects or any substantial increases in the severity of environmental effects identified in the certified Final SMP EIS/EIR (Sections 15162.1 and 15162.2). The proposed project would not require mitigation measures that would be considerably different from those identified in the SMP EIS/EIR (Section 15162.3(d)). The level of overall activities analyzed as part of the certified SMP EIS/EIR for restoration projects and the location is comparable to that under the proposed project. The potential environmental impacts associated with the proposed project were adequately identified and addressed in the certified SMP EIS/EIR. All of the mitigation measures included in the certified SMP EIS/EIR were adopted for the previously approved SMP. Throughout this addendum, the mitigation measures, where applicable, would not be considerably different from those disclosed in the SMP EIS/EIR and would be adopted for the proposed project, where appropriate. In addition, some of the the environmental commitments described in the SMP EIS/EIR would be adopted, as appropriate, for the proposed project. The significant and unavoidable impacts related to utilities and cultural resources identified in the SMP EIS/EIR would not occur under the proposed project because of the location of the proposed project and because there are no utilities or significant cultural resources on the project site.

Table 3-1 summarizes the status of impact determinations and the need for mitigation measures by resource based on the analysis contained within this document and compared to the SMP EIS/EIR for restoration projects. Table 3-2 provides a comparison of the environmental commitments and best management practices between the proposed project and the SMP EIS/EIR that are incorporated throughout the analysis within this document.

**Table 3-1. Status of Impacts by Resource of the Proposed Project Compared to the Final SMP EIS/EIR**

Resource	Proposed Project Impact Findings <sup>1</sup>			Required Mitigation in SMP?	Requires Substantially Different or New Mitigation Measures for Tule Red?
	Same as SMP EIS/EIR	Changed from SMP EIS/EIR	Substantially More Severe than Disclosed in SMP EIS/EIR		
Water Quality, Surface Hydrology, and Water Supply	LS		—	No	—
Biological Resources – Fisheries	LS		—	No	—
Biological Resources – Vegetation and Wetlands	LS		—	No	—
Biological Resources – Wildlife		LS	No	No	No
Air Quality, Greenhouse Gases, and Climate Change	LS with MM		—	Yes	No
Cultural Resources		LS	No	Yes	No
Land Use	LS		—	No	—
Aesthetics	LS		—	No	—
Agricultural Resources		NI	No	No	—
Geology, Soils, and Mineral Resources	LS		—	No	—
Hazards and Hazardous Materials	LS		—	No	—
Noise		NI	—	No	—
Recreation		NI	No	No	—
Transportation and Navigation		NI	—	No	—
Utilities and Public Services		LS	No	Yes	No
Population and Housing		NI	No	No	—

NI = No Impact

LS = Less than significant impact

LS with MM = Less than significant impact with mitigation

<sup>1</sup> The impact determinations summarized in this table reflect the multiple thresholds analyzed in this document. Each resource was given the most severe impact determination.

**Table 3-2. Comparison of Environmental Commitments and Best Management Practices of the Proposed Project to the Final SMP EIS/EIR**

Similar ECs/BMPs	Different ECs/BMPs	ECs/BMPs Not Needed
Standard Design Features and Construction Practices	Mosquito Abatement Best Management Practices	Standard Design Features and Construction Practices <sup>1</sup>
Limits on Access Points and Staging Areas	Hazardous Materials Management Plans	Noise Compliance
Erosion and Sediment Control Plan Requirements	Biological Resources Best Management Practices – General Best Management Practices	Traffic and Navigation Control Plan and Emergency Access Plan
Stormwater Pollution Prevention Plans	Biological Resources Best Management Practices – Special-Status Plant Species Protection	Recreation Best Management Practices
Air Quality Best Management Practices	Biological Resources Best Management Practices – Special-Status Wildlife Species Protection: Mammals	Visual/Aesthetic Best Management Practices
Inadvertent Discovery of Cultural Resource Requirements	Biological Resources Best Management Practices – Special-Status Wildlife Species Protection: California Clapper Rail and California Black Rail	
Cultural Resources	Nonnative Plant Control	
Biological Resources Best Management Practices – Worker Training	Biological Monitoring	
Biological Resources Best Management Practices – Protection of Special-Status Wildlife Species: Raptors		
Biological Resources Best Management Practices – Protection of Special-Status Wildlife Species: Birds		
Biological Resources Best Management Practices – Protection of Special-Status Wildlife Species: Western Pond Turtle		
Biological Resources Best Management Practices – Protection of Special-Status Wildlife Species: California Least Tern		
Construction Period Restrictions		

<sup>1</sup> Constructing structures in accordance with California Building Code and County General Plan standards to resist seismic effects and meet the implementation standards outlined in the general plan.

Ensuring that changes within Suisun Marsh channels will not significantly affect navigation and emergency access by having the Rio Vista and Vallejo Coast Guard stations review plans to assess safety issues associated with changes when there is potential for in-channel work to affect access.

## 3.3 Resources

The analysis in this addendum focuses on the changes to impacts on the environment that could occur as a result of implementing the proposed project under the SMP EIS/EIR. The scope of analysis contained within this section addresses each environmental resource area that was previously analyzed in the certified Final SMP EIS/EIR. Table 3-7, at the end of this chapter, provides an impact-by-impact discussion of each resource. The subsections below provide a summary of the SMP EIS/EIR and proposed project analysis of specific resources.

### 3.3.1 Water Quality, Surface Hydrology, and Water Supply

The previously certified SMP EIS/EIR evaluated water quality, surface hydrology, and water supply impacts resulting from restoration activities within the marsh and determined that impacts on these resources would be less than significant, as described in Table 3-7. Impacts on these resources would also be less than significant under the proposed project, as described in Table 3-7.

#### 3.3.1.1 Methylmercury and Dissolved Oxygen

##### SMP EIS/EIR

The SMP EIS/EIR determined that restoration activities would have less-than-significant impacts on methylmercury and dissolved oxygen (DO) because restoration would not increase the production and export of methylmercury when compared to baseline conditions in managed wetlands and could increase DO levels when compared to baseline conditions in managed wetlands, as described in Table 3-7.

##### Existing Conditions and Proposed Project

As described in Appendix C, *Methylmercury and Dissolved Oxygen Technical Memorandum*, of this document, the project site has documented levels of mercury (total Hg) and methylmercury (MeHg) that are generally consistent with, or slightly higher than, other areas of the marsh, managed wetlands in general, and Grizzly Bay ambient concentrations of total Hg and MeHg. The levels for total Hg are documented at 5.8 nanograms per liter (ng/L), and average MeHg is documented at 1.07 ng/L. Managed wetlands are typically considered sources of total Hg and MeHg because of the minimal mixing and the alternating wetting and drying cycles needed for management. Specifically, the prolonged drying associated with managed wetlands, along with other potential factors (e.g., the amount of available organic matter, organic carbon, DO and pH levels, sulfate, iron, Hg availability, temperature, salinity), provides conditions for producing MeHg. Typically, because of wetting and drying, MeHg in the marsh is highest during the fall flood-up and stays high until it tapers off after several months of continuous inundation through the winter. Studies on MeHg accumulation in fish tissues in Suisun Bay and Suisun Marsh have shown high levels of MeHg in fish (Appendix C). A regional study of mercury in small forage fish (silversides and topsmelt), from south San Francisco Bay to Suisun Marsh, documented average total Hg in silversides of less than 0.060 micrograms per gram; mercury concentrations were much lower for fish from Suisun Bay than for fish in San Pablo or San Francisco bays (Greenfield et al. 2013).

Tidal wetlands are considered both sources and sinks of total Hg and MeHg. Conversion of the project site from managed wetlands to tidal wetland is expected to reduce the episodic discharges of MeHg because they experience a much greater flow and are not periodically dried, which would reduce constituent concentration and MeHg formation in sediments, in the long term. The creation of more open-water areas, with longer inundation of restored tidal marshes, is also expected to reduce methylation of Hg in the long term. As evidenced by MeHg concentrations from the Blacklock restoration project in Suisun Marsh, long-term MeHg concentrations declined following conversion from managed wetlands to tidal after an initial period of increase in the MeHg load (Appendix C).

The Suisun Marsh Total Maximum Daily Load (TMDL) applicable to MeHg is still in development by the Regional Water Quality Control Board (Appendix C). The San Francisco Bay TMDL was approved in 2008 by the U.S. Environmental Protection Agency, which has a goal for total Hg in suspended sediment of 0.2 milligram per kilogram (mg/kg) (parts per million [ppm]). It is anticipated that, as part of establishing the Suisun Marsh TMDL or another effort (as documented in the SMP EIS/EIR), MeHg monitoring will occur within Suisun Marsh. As appropriate, monitoring may occur on the Tule Red restoration site as part of permitting and/or coordination with the Regional Water Quality Control Board to adaptively manage the site over time and monitor total Hg and MeHg (Appendix C). Because there is no evidence for concluding that tidal restoration would lead to increased problems with respect to MeHg for fish, wildlife, or consumers above baseline conditions and that tidal restoration would be expected to increase tidal prism and flushing and reduce residence time, a decrease in MeHg concentrations may occur; impacts would be less than significant. In addition, the proposed project may participate in a regional monitoring program to document and provide evidence for MeHg fate and transport as a result of tidal restoration.

Similar to levels of Hg and MeHg, the documented low levels of DO at the project site are generally consistent with, or slightly lower than, levels in other areas of the marsh and managed wetlands. The DO levels on the project site are documented to be low in October and March, April, and May. The DO levels on the project site are also influenced by the discharge from the California Department of Fish and Wildlife (CDFW) drain. Seasonal DO variations in the marsh occur, with most DO depressions occurring in early summer and fall in certain locations (e.g., northwestern Suisun Marsh). Preliminary load estimates suggest the most significant drivers of low DO levels in the marsh. Although there are areas of the marsh where it is known that DO is poor, DO patterns are not well understood in marsh sloughs. The effect of managed wetlands on DO is generally episodic (e.g., after discharge events) and associated with discharge events under certain tidal conditions (Appendix C).

The Tule Red project is not expected to reduce DO levels from their current low levels because managed wetland activities would cease once the project site is restored. An increase in tidal prism and flushing as well as reduced residence time are expected to result in increased in DO concentrations. The CDFW drain would continue to discharge onto the project site; this discharge is expected to contain low levels of DO. However, natural tidal flushing would occur under restoration, reducing residence time of the water on-site and increasing mixing and dilution. The proposed project would also install a spray aeration structure on the existing CDFW drain and construct a pooling area to improve DO levels (as described in Chapter 2 of this document). Monitoring of the discharge onto the project site would occur after installation of the spray aeration structure.

Impacts on water quality as a result of methylmercury and DO levels are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### 3.3.1.2 Salinity

#### SMP EIS/EIR

Hydraulic modeling was performed using RMA's hydrodynamic model to identify and evaluate potential tidal hydraulic changes and salinity changes from the SMP alternatives under different restoration scenarios. Changes in tidal elevations and tidal flows, both upstream and downstream of connections with new tidal wetlands, are somewhat difficult to anticipate; mathematical modeling is the most accurate method for simulating these effects. Specific restoration areas were not identified at the time of the analysis because they were not known. However, two possible distributions of new tidal wetlands within the marsh were simulated to estimate the likely general effects from substantial new tidal wetlands (about 7,500 acres in each representative simulation). These simulations assumed all the tidal wetland restoration occurred at one time and looked at the immediate effect on tidal elevations of the total restoration.

The SMP EIS/EIR determined that restoration activities would have less-than-significant impacts on salinity because modeled results did not indicate substantial changes in salinity that would affect the water quality of designated beneficial uses (e.g., drinking water supplies). The SMP EIS/EIR documented different yearly seasonal salinity regimes, which are controlled by the seasonal pattern of effective outflow. The SMP EIS/EIR modeling predicted that salinity changes at Suisun Marsh monitoring locations, including the eastern channels, would be much less than the maximum allowed by monthly objectives (monthly objectives defined in 1995 Bay-Delta Water Quality Control Plan).<sup>1</sup> In addition, the largest increase in upstream salinity would be much less than 10% of the average baseline salinity, with no month increasing by more than 10% of the salinity objective; therefore, no expected significant changes to exports or Sacramento–San Joaquin Delta (Delta) diversions were identified. The seasonal salinity pattern (determined primarily by Delta outflow) would remain similar, and any potential change to salinity should not reduce the value of marsh channel water for managed wetlands flood and drain operations.

#### Existing Conditions and Proposed Project

The magnitude of the salinity effects associated with restoration activities depends primarily on the location (and breach connection) of the new tidal wetlands and the size (acreage) of the new tidal wetlands. The proposed project is located in the central and southern portion of Suisun Marsh (Region 4), immediately adjacent to Grizzly Bay; this is the downstream terminus of managed wetland activities in the immediate area. The breach location would be in the northern portion of the project site, away from Roaring River.

The project site is approximately 420 acres. Modeling of salt transport, using electrical conductivity as a surrogate, was performed under baseline and proposed project conditions for the 2002 to 2003 period (the same years evaluated in the SMP EIS/EIR). This modeling determines potential salinity effects in the marsh and upstream of the marsh as a result of the Tule Red project (Appendix D.1, *Salinity Modeling Analysis of the Proposed Tule Red Tidal Marsh Restoration*). Overall the model predicted very small increases in salinity during the time period at the locations that were evaluated. These results are detailed in Appendix D.1 of this document and summarized below.

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<sup>1</sup> The 1995 Bay-Delta Water Quality Control Plan was updated in 2006; however, no substantive changes were made to the water quality objectives for protecting beneficial uses related to salinity.



- Very small maximum changes in salinity at Jersey Point and Emmaton (western Delta), +0.4% and +0.3% for 2002 (2003 changes were even less).
- Very small maximum changes in salinity for the Mallard Island west Delta location, +0.7% for 2002 (2003 changes were even less).
- Very small maximum changes at upstream southern Delta export locations, +0.2% and +0.3% in 2002.
- Very small changes in salinity for Beldon's Landing in the eastern marsh, between +0.5% and -0.5% for 2002 and 2003.
- Very small changes in salinity at Montezuma slough above the salinity control gates, between +0.7 and -1.0% for 2002 and 2003.

These changes for the western Delta and export locations are consistent with the water quality objectives stated in the SMP EIS/EIR.

Electrical conductivity at the Contra Costa Water District (CCWD) Rock Slough location was processed to evaluate potential changes in chloride compliance (i.e., an overall maximum mean daily chloride limit of 250 milligrams per liter (mg/L) and a level less than or equal to 150 mg/L at least 165 days for 2002 [dry water year] and 190 days for 2003 [above-normal water year]) at the Rock Slough intake location. The peak values for both the baseline and the proposed project were 203 mg/L and meet the 165- and 190-day requirements (Appendix D.1, Table 4). Electrical conductivity at CCWD Old River, at State Route 4, and CCWD Victoria Canal showed almost no changes between baseline and project conditions (Appendix D.1, Tables 9 and 10). Therefore, impacts on water quality as a result of salinity levels are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### 3.3.1.3 Hydrology and Water Supply

#### SMP EIS/EIR

Restoration of tidal wetlands was evaluated in the SMP EIS/EIR to determine if restoration would significantly alter tidal elevations or velocities. Alteration could affect the timing of available water related to the riparian water supply of managed wetlands, mobilize sediment, and cause erosion because of changes in hydrology. The RMA model was used to understand changes in velocity and how sediment may be mobilized and transported under restoration conditions in the SMP EIS/EIR. The SMP EIS/EIR determined that restoration breaches could be designed to ensure that tidal flows would remain below about 2 feet per second (fps) to prevent tidal muting (i.e., reduced tidal range) caused by the increased water surface gradient during peak tidal flows in channels with relatively high velocities and thus not affect the managed wetland water supply. It was also determined that breaches could be designed to ensure that tidal flows would remain below 3 fps to prevent tidal muting or scouring caused by the increased water surface gradient during peak tidal flows in channels with relatively high velocities. As such, impacts on hydrology and water supply were determined to be less than significant (Bureau of Reclamation [Reclamation] 2011, Chapter 5).

#### Existing Conditions and Proposed Project

The hydrodynamics of Suisun Marsh are influenced by numerous factors, including daily tides from San Francisco Bay, input from the Sacramento-San Joaquin Rivers and Delta, and diversions for managed wetland activities and water supply. Tidal hydraulics, in turn, influence the availability and

the timing of water supply for the managed wetlands and sediment transport (e.g., scour and deposition) in the marsh (Reclamation 2011, Section 5.1). Most water is diverted by gravity to the managed wetlands, and these flooding operations rely on adequate tidal water elevations to divert water from the channels (Reclamation 2011, Section 5.1). Tidal velocities in the marsh are controlled by the tidal flows and the cross sections in the marsh channels and sloughs. The peak velocities are generally less than 2 to 3 fps (Reclamation 2011, Section 5.1). The natural processes of scouring and deposition produce channel sections in the marsh that are in equilibrium with these processes and the upstream tidal area (volume) (Reclamation 2011, Section 5.1). Velocities of more than 3 fps are likely to scour mud and sand bottoms (Reclamation 2011, Section 5.1). Channels are accumulating sediment where channel velocities are low enough for sediment to settle out of the water column (Reclamation 2011, Section 5.5). Where channel velocities are higher, sediments are suspended and carried in the direction of flow until they settle out again. If the tidal prism (i.e., upstream tidal volume) changes through restoration, scour zones and depositional zones could also change (Reclamation 2011, Section 5.5).

The project site is located in Region 4 of Suisun Marsh. This region includes Grizzly, Van Sickle, Hammond, Simmons, Chipps, and Wheeler Islands. Montezuma Slough, the Sacramento and San Joaquin Rivers, and Grizzly, Suisun, and Honker Bays hydrologically dominate this area (Reclamation 2011, Section 6.2). All of these channel and bays are highly energetic, with enormous daily movements of water driven by tides, Delta outflow, wind, and the Suisun Marsh Salinity Control Gates (SMSCG) (Reclamation 2011, Section 6.2).

The hydrodynamics expected under the proposed project were evaluated using a two-dimensional depth-averaged hydrodynamic model, as described in Appendix D.2, *Hydraulic and Geomorphic Basis of Design Report*, of this document. This model was run multiple times to refine different restoration concepts and breach locations. The final run was completed in the fall of 2015 using the conceptual plan described in Chapter 2, *Project Description*, of this document. The modeling helps determine potential impacts associated with the proposed project as well as the hydraulic and geomorphic design needed to meet the ecological goals of the proposed project. The model allowed evaluation of the ability of the tidal channels to provide full tidal exchange throughout the project site, given local tidal characteristics, as adapted from Port Chicago tide records; vegetation roughness on the marsh plain; and the proposed channel layout. Hydraulic shear stresses from the model were compared to sediment properties that were estimated to be characteristic for the project site to ensure that excavated channels were not depositional and determine rates of erosion if channels were not fully excavated at the time of the breach.

The proposed project's internal tidal channels (i.e., not connected to other sloughs or waterways) would have velocities of 2 to 3 fps. In Grizzly Bay (modeled at approximately 1,500 feet out into the bay from the site), velocities are only 0.2 fps. The 0.2 fps velocity is consistent with existing-condition velocities, indicating that local impacts on velocity do not extend out that far. The results of the numerical modeling and observations of other tidal marsh sites around Suisun and San Pablo Bay do not indicate that a scour hole is likely to form at the entrance to project site (NHC pers. comm.).

As described in Appendix D.2, the proposed project is being constructed on a lower marsh plain, lower than the mean high water, with an excavated tidal network, providing significant tidal prism volume and associated tidal flux for flushing flows throughout the constructed tidal channel network. Erosion can occur when shear stress exerted by a fluid over a channel surface exceeds the critical shear stress of the channel bed material. Tidal fluctuations, flooding, and draining of the

marsh are the driving forces of shear stress in a tidal marsh channels. As a response to this shear stress, bed material erodes from the channel bed and becomes entrained in the current. Thus, the channel becomes deeper, with steeper side slopes that can erode. Results of the hydrodynamic model show that shear stresses in the channels are great enough to provide erosion, where needed, and establish equilibrium on the project site; they are also high enough to inhibit deposition of fine suspended sediments on the margins of the constructed tidal channels. It is expected, and the modeling predicts, that purposeful erosion will occur at the breach and in portions of the larger fourth-order channel along the habitat berm under project conditions; the project site can develop its final channel width and depth naturally and reach equilibrium over time (estimated to be between 0.2 year and 1.8 years after breach) (Appendix D.2). Therefore, impacts on surface hydrology, sediment, and water supply are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## 3.3.2 Biological Resources

### 3.3.2.1 Fisheries

The SMP EIS/EIR evaluated the potential impacts of restoration activities on the various life stages of sensitive, special-status, and other fish species, as described in Table 3-7 of this document. This section provides a summary of sensitive, special-status, and other fish species, as evaluated in the SMP EIS/EIR, under the proposed project.

The SMP EIS/EIR evaluated the potential impact of restoration activities on passage and holding or rearing habitat as well as salinity-related impacts on the various life stages of sensitive and special-status fish species, as described in Table 3-7 of this document. The sensitive and special-status fish species evaluated were delta smelt, Chinook salmon (four races or runs), steelhead, green sturgeon, splittail, and longfin smelt. The SMP EIS/EIR also included a broad analysis of the composition of general species of different fish and the potential to affect benthic invertebrate communities. The primary restoration activity evaluated in the SMP EIS/EIR that could affect sensitive, special-status, and other fish species was the breaching of external levees to allow for tidal exchange. The SMP EIS/EIR used RMA modeling to determine which velocities would allow for fish passage and meet the habitat needs of sensitive and special-status fish species during site restoration. Based on the environmental commitments in the SMP EIS/EIR (summarized in Table 3-7 of this document) and the characteristics and conditions related to breaching the levees, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on sensitive and special-status fish species, fish species in general, and benthic communities.

## Existing Conditions and Proposed Project

California Central Valley steelhead, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley fall-/late fall-run Chinook salmon, delta smelt, longfin smelt, Sacramento splittail, and green sturgeon are listed special-status native species that occur in Suisun Marsh. The SMP EIS/EIR (Table 6.1-3) describes the status, distribution, and likelihood of occurrence for these species in Suisun Marsh as well as designated critical habitat. This information is current, with the exception of the federal listing for longfin smelt, which is now considered a candidate for listing. Adult and juvenile Chinook salmon, steelhead, and green sturgeon are known to migrate through Suisun Bay and major sloughs of Suisun Marsh; juveniles are known to occur or potentially occur in these waters and smaller sloughs of the marsh. Delta smelt, longfin smelt, and

Sacramento splittail are found throughout the marsh. Subtidal, low-intertidal, low-marsh, mid-marsh, and high-marsh areas all provide habitat for special-status fish species (Reclamation 2011, Section 6.1). The SMP EIS/EIR (Tables 6.1-4 and 6.1-5) describes life-stage timing for these species in Suisun Marsh and their salinity and velocity tolerances. This information is current; however, longfin smelt (adults and juveniles) and delta smelt (estuarine-rearing adults and juveniles) may be found year-round, including the summer months. Studies in the marsh have found that most species are found in smaller sloughs. In general, juvenile native species use the marsh as a rearing area in the winter and spring months, while nonnative species use the marsh in the summer and early fall months when the water is warmer. The number of native fish species has declined over the years (Reclamation 2011, Section 6.1).

The project site is located in Region 4 of the marsh. This region has seen a significant investment in fish-screened facilities over the last 15 years, with diversions to about 20,000 acres of managed wetlands. The presence of numerous fish-screened facilities, including the Roaring River Distribution System, has changed management strategies for these wetlands. Many of the managed wetland areas in this region obtain their water from Montezuma Slough and drain to the bays if physically possible. If not, the wetland areas drain directly into the large tidal sloughs (Reclamation 2011, Section 6.1).

As described in Chapter 2, *Project Description*, of this document, the proposed project would be implemented in two phases. Phase 2 would consist of breaching the natural berm to restore tidal action to the site; this would occur in 2017 or 2018. As described in the SMP EIS/EIR, Phase 2 activities have the potential to affect fish species because a connection between Grizzly Bay, where fish species may be present, and the project site would be established. All in-water activities associated with Phase 2, which would be permitted by various regulating agencies (e.g., U.S. Army Corps of Engineers [Corps], Regional Water Quality Control Board), would occur only during the period of September 1 through November 30. This is the appropriate time for performing in-water work because it avoids periods when special-status species are likely to be present. All environmental commitments, as described in Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*, of the proposed project would be applied to protect fish species. Specifically, this appendix describes all programmatic conservation measures identified in the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) Programmatic Biological Opinion for the SMP EIS/EIR that are applicable to special-status fish species and the proposed project would implement.

The SMP EIS/EIR included an adaptive management and monitoring plan to outline the need for, and the intent of monitoring and adaptive management, as well as general considerations for project proponents. As described in Appendix E, *Adaptive Management and Monitoring Plan*, of the SMP EIS/EIR, project proponents will be responsible for implementing monitoring as incorporated into project planning documents. The approach for each restoration action is to be determined by the specific lead agencies and will be based on the SMP EIS/EIR, project-specific design components, consideration of any new information (including that obtained through the implementation of the AMP), or other factors. Each project will create a monitoring plan that clearly identifies each monitoring activity, expected results, and responsible party for each monitoring activity. To make monitoring useful, choices of ecological attributes to monitor and how to monitor them (frequency, extent, intensity, etc.), must be linked closely to the management situation that motivates the monitoring.

Consistent with the intent and information contained in Appendix E of the SMP EIS/EIR, monitoring would occur as part of the proposed project to inform adaptive management. Monitoring would occur for a number of species, but specifically, fish monitoring would occur to inform the project objectives as outlined in the Biological Assessment (ESA 2016). These objectives are related to enhancing regional foodweb productivity, providing rearing habitat for out-migrating juvenile salmon, providing habitats for aquatic and wetland dependent species, and providing topographic variability for resilience against climate change and sea level rise. The monitoring would measure the expected outcomes related to those objectives, the metrics by which progress towards meeting the objectives, as well as triggers for undertaking a management response if goals are not being met or problems occur which require intervention.

### Fish Passage

The timing of the breach (September 1 through November 30) would minimize the potential for entrainment by avoiding the winter and spring months when the most sensitive life stages (larvae and early juveniles) of special-status species are likely to be present in Grizzly Bay. Entrainment of salmonids into the site is not expected because of the velocities expected on- and off-site (Appendix D.2 and NHC pers. comm.). In addition, the velocity accelerations expected in the pelagic zone, an area that delta smelt and other fish inhabit, are predicted to be less than the 1 fps design guidance of the SMP EIS/EIR (Appendix D.2 and NHC pers. comm.). If fish do enter the project site, the vegetated channel margins would be roughened, providing respite for fish from higher velocities (i.e., 2 to 3 fps) and allowing them to move out on the ebb tide and return to relatively calm Grizzly Bay. Therefore, impacts on fish passage, as described in Table 3-7, are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### Habitat

Restoration activities under the proposed project would be outside of the riparian vegetation zone and in brackish water areas of an existing managed wetland; therefore, such activities are not anticipated to reduce cover or habitat for salmonids. Levee breaching for the proposed project would affect only small areas, and scouring impacts on aquatic vegetation would be minimal compared to existing and created habitat. Furthermore, the restoration design includes intertidal habitat that would provide vegetative cover after breaching. Therefore, impacts on habitat, as described in Table 3-7, are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### Salinity

The breach location at the northern end of the project site and the tidal exchange between the project site and Grizzly Bay can result in a change in salinity within the marsh and in upstream areas. This change could affect fish survival, growth, and movement. As described in the SMP EIS/EIR, Table 6.1-5, sensitive fish species have a wide range of salinity tolerances; large changes in salinity would need to be experienced to have significant effects on survival, growth, and movement. As described above in Section 3.3.1.2, *Salinity*, the proposed project was modeled using the RMA Bay-Delta Model (the same model used in the SMP EIS/EIR). The difference between baseline and the simulated project condition results in the 2002–2003 period is very small for all locations that were simulated. Maximum differences depend on the location simulated but range between -1.0%

and +0.7% (Appendix D.1.). Table 3-3, below, provides a summary of the results. Detailed results can be found in Appendix D.1, Tables 2, 3, and 6 through 10.

**Table 3-3. Range of Salinity Changes at Certain Locations**

Location	Month	Base EC (uS/cm)	EC Change (uS/cm)	EC Change (%)
Beldon's Landing	June 2002	5,336	24.5	0.5
	April 2003	1,957	-9.1	-0.5
Montezuma Slough	April 2002	1,427	10.6	0.7
	April 2003	878	-8.6	-1.0
Mallard Island (Western Delta)	April 2002	1,472	10.6	+0.7
	April 2003	878	-8.6	-1.0

EC = electrical conductivity; uS/cm = microSiemens per centimeter

Given the very small maximum differences between the simulated baseline and project conditions at the different modeled locations and the wide tolerance of salinity in the sensitive fish species that are typically present in Suisun Marsh, salinity-related effects on fish survival, growth, movement, or reproduction attributable to restoration activities are not expected. Therefore, impacts on salinity, as described in Table 3-7, are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### Monitoring

The fish monitoring would be coordinated with regional monitoring by IEP and UC Davis Suisun Marsh Fish Study, and other agency programs. Both NMFS and USFWS have been consulted regarding the monitoring for the proposed project and potential take of special-status fish species during monitoring (ESA 2016). The incidental take of salmonids and sturgeon associated with monitoring is permitted under the NMFS 2009 Biological Opinion on the Long term Operations of the Central Valley Project and State Water Project (OCAP BO) (NMFS 2009). As recommended by USFWS, the proposed project is using similar monitoring methods as the IEP Fish Restoration Program and the take estimates associated with those IEP monitoring methods (ESA 2016). Post-breach monitoring would occur during the first five years after breaching (Interim Management Period) for at least three of the five years (e.g., Year 1, 3, and 5). A likely schedule would be fish and pelagic foodweb sampling 3 times a year (spring, summer and fall), and benthic invertebrate sampling twice a year (spring and fall). The aquatic sampling would be designed to meet the requirements for FAST crediting approval monitoring, while minimizing the amount of take to the extent feasible. Fish sampling would be scaled to the population index of the previous year. Prior to defining the upcoming year's sampling program, recent trends in population indices for delta smelt, longfin smelt, and listed salmonids would be reviewed. Sampling intensity and methods would be adjusted to reduce potential for take in years when population indices are deemed at critical levels. Monitoring would be done consistent with conditions of the NMFS 2009 Biological Opinion on the Long term Operations of the Central Valley Project and State Water Project and the Biological Opinion for the proposed project, which will include the following conditions:

- To avoid harming delta smelt (and other fish) during sampling, fish would be carefully removed from nets, processed quickly, held in suitable containers with aeration, and returned to suitable habitat as soon as possible. Any incidentally caught adult delta smelt fish will be released alive immediately.

- If any method captures 25% or more of the total listed fish take in one tow, it will be discontinued.
- Take of delta smelt will be linked and scaled to the population index in coordination and consultation with IEP and USFWS. Each year prior to any sampling occurring, a maximum amount of take based on current population metrics would be developed and adhered to during the monitoring program.
- The sampling program will be adjusted as new technologies with lower risk of take become available, such as “smelt cam” and environmental DNA.
- To avoid harming listed salmonids and green sturgeon (and other fish) during sampling, fish would be carefully removed from nets, processed quickly, held in suitable containers with aeration, and returned to appropriate habitat as soon as possible.
- The sampling program will be adjusted as new technologies with lower risk of take become available, such as environmental DNA

Given that monitoring would be done in accordance with the existing Long-Term Operations Biological Opinion (NMFS 2009) and the proposed project Biological Opinion, would incorporate measures similar to those of other programs (IEP), and that monitoring would occur over different temporal and geographic scales, impacts would be less than significant. No mitigation is required.

### 3.3.2.2 Vegetation and Wetlands

The SMP EIS/EIR evaluated the potential direct and indirect impacts of restoration activities on the various special-status plant species and land cover types, as described in Table 3-7 of this document. The SMP EIS/EIR defined special-status plant species as species that are legally protected under the California Endangered Species Act (CESA), the federal Endangered Species Act (ESA), or other regulations as well as species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants were included in the SMP EIS/EIR evaluation based on their potential to occur in the study area; species that are not found in land cover types present in the study area were eliminated from further consideration (see Table 6.2-3 of the SMP EIS/EIR<sup>2</sup>). The special-status plant species evaluated were soft bird’s-beak (*Cordylanthus mollis* var. *mollis*), Suisun thistle (*Cirsium hydrophilium* var. *hydrophilium*), Suisun Marsh aster (*Symphotrichum lentum*), Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason’s lilaepsis (*Lilaeopsis masonii*) and Delta mudwort (*Limosella subulata*). The SMP EIS/EIR also included a broad analysis of land cover types and the effects of restoration on these land cover types. Land cover types in the marsh have been mapped and defined for numerous studies and documents. As a result, the definitions of the various land cover types vary slightly. For the purpose of the SMP EIS/EIR, the land cover types were identified by CDFW. These land cover types include bays and sloughs, tidal wetlands, managed wetlands, riparian, uplands, seasonal wetlands, vernal pools, and developed areas (Section 6.2 Reclamation 2011, Section 6.2).

The primary restoration activities evaluated in the SMP EIS/EIR that could affect special-status species and land cover types were grading and excavating, breaching of external levees to allow for

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<sup>2</sup> A California Natural Diversity Database (CNDDDB) search was performed in December of 2015 to update and confirm the documentation of special-status plant species in the marsh. One other special-status plant species was identified within a 5-mile radius of the project site that was not identified in Table 6.3-2 of the SMP EIS/EIR, Bolander’s water-hemlock (*Cicuta maculata* var. *bolanderi*). The special-status plant surveys of the project site (Appendix E, *Special-Status Plant Surveys*) did not identify this species on the project site.

tidal exchange, and construction of habitat berms. In addition, the potential for tidal muting or scour under restored conditions could also result in impacts on special-status plant species or vegetation types (Reclamation 2011, Section 6.2). The SMP EIS/EIR qualitatively analyzed the presence of special-plant and land cover types within the marsh as well as the types and locations of different habitats in the marsh to determine potential indirect and direct effects of restoration. The analysis assumed temporary and permanent impacts on vegetation and wetland resources in the marsh. Temporary impacts would be those that occur only during the construction period (i.e., associated with restoration and enhancement of wetlands). Permanent impacts would occur as a result of irreversible changes in land cover types. The analysis was based on the most current proposed implementation of the SMP, as described in the EIS/EIR and existing biological resource information. Based on the environmental commitments in the SMP EIS/EIR (summarized in Table 3-7 of this document) and the characteristics and conditions of restoration, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on special-status plant and land cover types.

The section below provides a summary of special-status and land cover types, as evaluated in the SMP EIS/EIR and under the proposed project (Reclamation 2011, Section 6.2).

## Tidal Wetlands

### SMP EIS/EIR

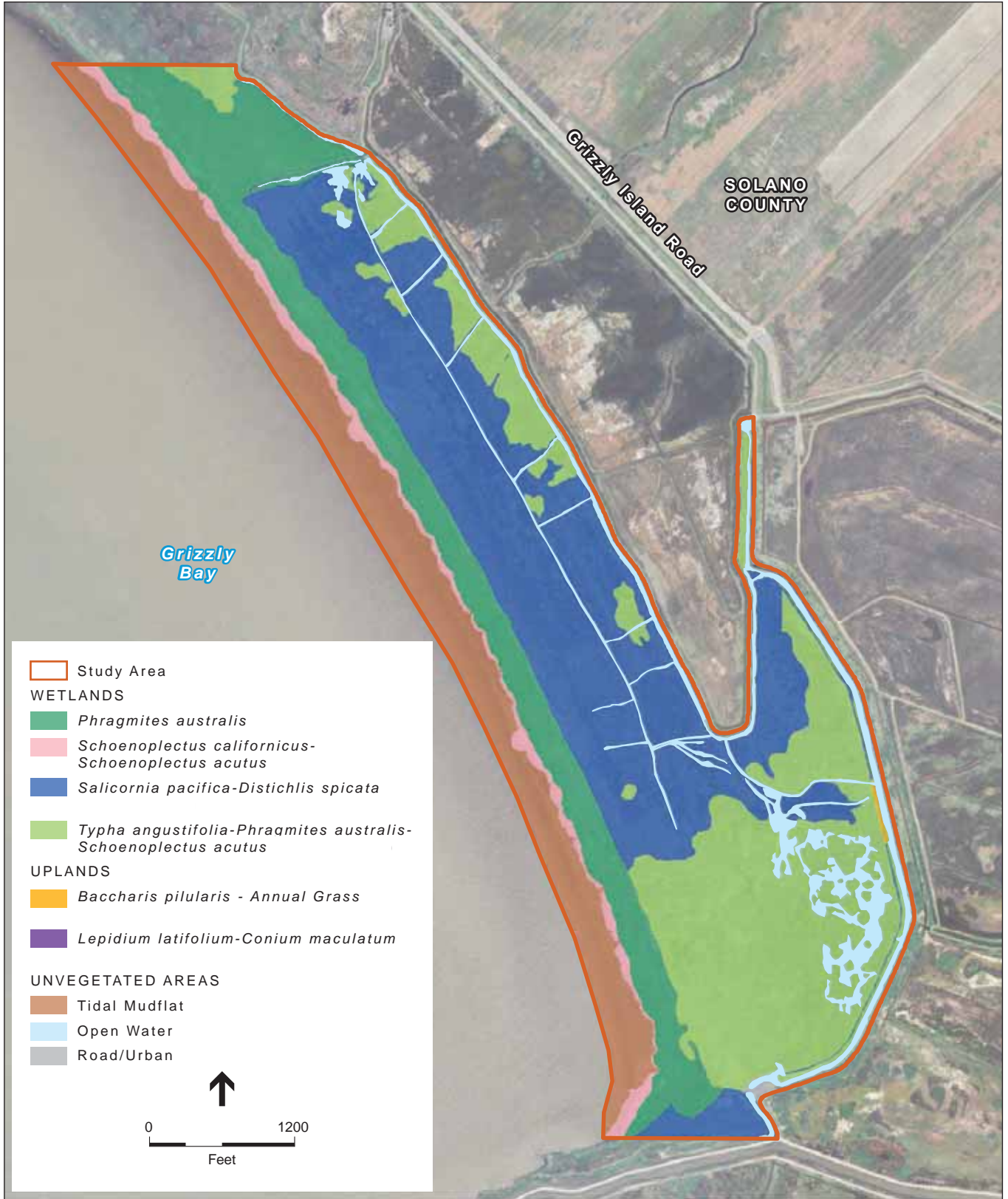
The restoration of tidal wetlands was evaluated in the SMP EIS/EIR to determine if it would significantly affect tidal wetlands, an important land cover type in Suisun Marsh. The evaluation documented that construction activities related to converting habitat in managed wetlands to tidal wetlands would result in a temporary reduction in tidal wetland acreage; however, the purpose of restoration is to create many more acres of this land cover type within the marsh. During construction, exterior levee breaching is expected to convert a small amount of tidal wetland acreage to aquatic perennial habitat. This is because the area of the levee that may have had tidal wetlands/emergent vegetation would be removed to allow for tidal exchange and restoration of the managed wetlands to tidal wetlands. However, the amount of affected acreage would be relatively small compared to the amount anticipated to be restored to tidal habitat (i.e., 1%).

Under restored conditions, increased scour could occur temporarily as a result of greater flows near breach sites. Although existing tidal wetlands in the vicinity of the levee sections may be affected (e.g., through temporary conversion of a small amount of tidal wetlands to tidal perennial aquatic habitat), breach locations would be chosen that would minimize upstream tidal muting, tidal elevation changes, channel scour, and hydraulic changes. Therefore, the SMP EIS/EIR determined that restoration activities would have a less-than-significant impact on tidal wetlands, as described in Table 3-7 of this document.

### Existing Conditions and Proposed Project

The project site is located in Region 4 of Suisun Marsh, the largest geographic region in the marsh. The 36,094 acres in this region make up approximately 47% of the terrestrial and aquatic habitat in the marsh. Tidal wetlands account for 8% (2,940 acres) of the land cover in this region. The project site supports approximately 50 acres of tidal emergent wetland. Most of this area is located along the natural berm adjacent to Grizzly Bay (Figure 3-1). The vegetation in this area consists primarily of tules (*Schoenoplectus californicus* and *S. acutus*) (ESA 2015).





Source: Westervelt Ecological Services , 2015.

Figure 1  
Vegetation



The proposed project went through several rounds of project design, during which time different breach locations were evaluated to determine their potential efficacy for restoration success and their impacts on areas outside of the project site, per the SMP EIS/EIR assumption that breach locations would be chosen to minimize upstream tidal muting, tidal elevation changes, channel scour, and hydraulic changes (ESA 2015). A breach location on the northern end of the project site would ensure adequate tidal inflow and meet the biological goals and objectives of the site. It would also allow appropriate velocities so that scour and erosion would not occur off-site. During construction activities, as part of Phase 2 of the proposed project, the natural berm would be breached in the northern section of the project site to allow for tidal exchange. This would require removing a 50-foot section of the natural berm. Ultimately, the breach would widen and reach equilibrium at approximately 120 feet. As such, this area (less than 1 acre) of existing tidal wetlands on the natural berm in the area of the breach would be converted to tidal perennial aquatic habitat to allow for tidal exchange. Under restored conditions, tidal exchange would occur between Grizzly Bay and the project site on a daily basis. As such, the project site would gain approximately 334 acres of tidal wetlands, for a total of 454 acres of tidal wetlands. This gain is consistent with the expectation of the SMP EIS/EIR (i.e., that a relatively small loss of tidal wetland would occur), but the restoration of tidal action would restore more tidal wetland habitat than would be affected.

This tidal exchange is expected to perform some erosion within the project site to establish equilibrium conditions; however, it is not expected to erode or scour the existing natural berm or areas within Grizzly Bay. As discussed in Section 3.1.1, *Water Quality, Surface Hydrology, and Water Supply*, of this document, tidal velocities would be at or below 3 fps within the interior of the project site and only 0.2 fps approximately 1,500 feet out into Grizzly Bay. These velocities are similar to existing conditions or locations in other parts of Suisun and San Pablo Bay and do not indicate that erosion or scour would occur. As such, it is anticipated that existing tidal wetlands would not be affected through scour. Therefore, impacts on tidal wetlands are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Managed Wetlands

### SMP EIS/EIR

Restoration of tidal wetlands was evaluated in the SMP EIS/EIR to determine if restoration would significantly affect managed wetlands, an important land cover type in the Suisun Marsh. The evaluation concluded that converting the habitat in managed wetlands to tidal wetlands would result in a permanent decrease in the managed wetland acreages in the marsh (5,000–7,000 acres); however, an increase the amount of tidal wetlands within the marsh would provide some of the functions and values as the managed wetlands. In addition, the tidal wetlands would provide habitat and food sources that benefit tidal wetland-dependent species and many, but not all, managed-wetland dependent species. Therefore, the SMP EIS/EIR determined that restoration activities would have a less-than-significant impact on tidal wetlands, as described in Table 3-7 of this document.

### Existing Conditions and Proposed Project

The project site is located in Region 4 of the Suisun Marsh. Managed wetlands and tidal wetlands account for 80% (28,628) of the land cover in this region. The project site consists of approximately 320 acres of managed marsh (non-tidal) that supports phragmites (*Phragmites australis*),

pickleweed (*Salicornia pacifica*)-saltgrass (*Distichlis spicata*), cattails (*Typha angustifolia*), and tules (*Schenoplectus acutus*). The road margins support ruderal vegetation comprising mainly perennial pepperweed (*Lepidium latifolium*) and poison hemlock (*Conium maculatum*), with occasional mature coyote brush shrubs (*Baccharis pilularis*), wild radish (*Raphanus sativus*), and annual grasses (*Bromus diandrus*, *B. hordeaceus*, and *Hordeum murinum*). Most of this vegetation is located in the interior of the project site or on the easterly side of the natural berm or on the roads (Figure 3-1). The project site would result in a conversion of the managed wetlands to tidal wetlands. Overall, construction activities as part of Phases 1 and 2 of the proposed project would temporarily disturb approximately 150 acres of managed wetlands (i.e., jurisdictional waters of the United States), and the conversion of managed wetlands to tidal wetlands would result in a permanent net loss of up to 10 acres of managed wetlands (i.e., jurisdictional waters of the United States) as a result of the habitat berm incorporated into the proposed project.

The Draft (USFWS 2009) and Final Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 21013a) provides a clear scientific basis for tidal restoration in Suisun Marsh. The goal of the Recovery Plan is the comprehensive restoration and management of tidal marsh ecosystems in five recovery units—Suisun Bay being one of them. The Suisun Bay Recovery Unit is divided into the Western Suisun/Hill Slough Marshes, Suisun Slough/Cutoff Slough Marshes, Nurse Slough/Denverton Slough Marshes, and Grizzly Island Marshes. These areas correspond with Regions 1, 2, 3, and 4 of the SMP. Depending on the location within Suisun Marsh, different species would benefit from tidal restoration or improved management of diked managed wetlands. The four endangered species that would benefit from implementation of the SMP are the California clapper rail (*Rallus longirostris obsoletus*), salt marsh harvest mouse (SMHM) (*Reithrodontomys raviventris*), Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), and soft bird's-beak (*Cordylanthus mollis* ssp. *mollis*). Tidal restoration in Region 4 would aid in the recovery of soft bird's beak and SMHM, as described in Sections 6.2 and 6.3 of the SMP EIS/EIR, respectively. Additionally, restoration is expected to benefit delta smelt by providing increased food productivity inside and exported from the marsh as well as additional rearing habitat for longfin smelt, salmonids, and other fish species (Reclamation 2011, Chapter 14).

A qualitative comparison of the ecosystem functions and services offered under the existing pre-project (managed marsh complex) condition versus the proposed project (tidal wetland complex) was prepared for the Corps in the Supplemental Information Documentation to the 404 Permit Application for the proposed project (ESA 2015). The qualitative comparison included elements of both the California Rapid Assessment Method (CRAM) and the Hydrogeomorphic Approach and adapts them for a qualitative assessment, comparing functions before and after restoration of the project site (ESA 2015).<sup>3</sup> Based on the comparison, the level and suite of functions and services that are offered by the proposed tidal wetland complex are superior to those associated with managed marsh complex, such as that currently existing at the Tule Red site (ESA 2015). In particular, the following are anticipated to be enhanced by the proposed project: hydrogeomorphic processes, tidal marsh, marsh-upland transition habitat, fish habitat, and foodweb support for the aquatic ecosystem (ESA 2015). These functions are expected to be enhanced in part because of the habitat berm, which was deemed by the project proponents and state and federal agencies as a necessary component that provides the

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<sup>3</sup> CRAM assesses wetland condition by using attributes of landscape context, hydrology, physical structure, and biotic structure (vegetation) and identifying key stressors. The Hydrogeomorphic Approach is a wetland assessment procedure based on three fundamental factors that influence how wetlands function: position in the landscape (geomorphic setting), water source (hydrology), and the flow and fluctuation of the water once in the wetland (hydrodynamics).

following: upland refugia for wildlife species, a mosaic of different habitats within the restored area, and a means to protect sensitive species (i.e., SMHM) that rely on tidal habitat. In addition, managed wetlands are hydrologically disconnected approximately half of the year because they are purposefully drained and dried. Therefore, they physically cannot provide the full value of wetlands throughout the year. As such, the restoration design of the proposed project meets the SMP EIS/EIR intent of including habitat levees, benches, and other features that would provide some of the functions and values as the managed wetlands. As the tidal wetlands become established, they will increase the variety of wetland functions and values. Although project implementation would result in temporary disturbance of wetlands due to construction and a net loss of up to 10 acres of waters of the United States, the overall structure and function of the tidal wetland ecosystem, including tidal exchange and foodweb production, would increase substantially in both quantity and quality (ESA 2015).

Overall, there would continue to be approximately 52,000 acres of managed wetlands in Suisun Marsh and approximately 28,294 acres in Region 4 that would provide the type of function and value associated with managed wetlands. Therefore, considering the function and value the tidal wetlands would provide and the number of acres converted in Region 4 (approximately 1%), impacts on managed wetlands would be within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Upland Plant Communities

### SMP EIS/EIR

Restoration of tidal wetlands was evaluated in the SMP EIS/EIR to determine if restoration would significantly affect upland plant communities, an important land cover in the Suisun Marsh. The evaluation concluded that levee breaching could disturb upland plant communities; however, upland areas would be protected through the selection of breach sizes and locations in consideration of the habitat that would be affected. Therefore, the SMP EIS/EIR determined that restoration activities would have a less-than-significant impact on upland plant communities, as described in Table 3-7 of this document.

### Existing Conditions and Proposed Project

The breach to occur in Phase 2 would be located in the northern portion of the project site and be approximately 50 feet wide. The breach would reach equilibrium at approximately 120 feet wide. As documented in Appendix E, *Special-Status Plant Species Surveys*, of this document and Figure 3-1, the current site of the breach comprises primarily non-upland plant communities (i.e., tule). Therefore, breaching of the existing natural berm would not disturb upland plant communities. Impacts are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Noxious Weeds/Invasive Plants

### SMP EIS/EIR

Restoration of tidal wetlands was evaluated in the SMP EIS/EIR to determine if restoration would result in the significant spread of noxious weeds or invasive plant species. The evaluation concluded that soil-disturbing activities associated with grading and construction could promote the introduction of noxious weeds. In addition, invasive plant species could spread as a result of either public access after restoration occurred on a site or through possible tidal muting. However,

invasive species would be controlled through various environmental commitments and through restoration project design measures (i.e., breach location evaluation and selection). Based on this and the environmental commitments described in Table 3-7 of this document, the SMP EIS/EIR determined that restoration activities would have a less-than-significant impact on invasive plant species and noxious weeds.

## Existing Conditions and Proposed Project

Currently, there are known invasive species at the project site, including common reed or phragmites (*Phragmites australis*), which is controlled on the project site in the summer management period by herbicide application during the flowering period. Much of the phragmites occurs on the natural berm adjacent to Grizzly Bay, and it cannot be removed without undermining the structural integrity of the berm, which would compromise the design and objectives of the proposed project. Although phragmites is an invasive species that is known for capitalizing on disturbance, and the proposed project does include grading and disturbing approximately 150 acres, the proposed project would include multiple environmental commitments, as described under Nonnative Plant Control in Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*, of this document, to avoid introducing invasive nonnative species and substantially improving conditions for invasive species. These environmental commitments are the same as those found in Appendix F, *Mitigation Monitoring and Reporting Program*, of the SMP EIS/EIR, with the one exception of including the option of using a naturalized seed mix instead of certified weed-free native mixes for any restoration planting, as provided in the revegetation plan developed in cooperation with CDFW. Furthermore, as described in Sections 5.3.2.1, *Fisheries*, and 5.3.1.3, *Hydrology and Water Supply*, the velocities expected during the initial breach and as the project site reaches equilibrium are not velocities that would lead to tidal muting. Therefore, the breach is not expected to increase the spread of invasive plant species. As such, impacts are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Special-Status Plants

### SMP EIS/EIR

Restoration of tidal wetlands was evaluated in the SMP EIS/EIR to determine if restoration would significantly affect special-status plant species documented in the Suisun Marsh. The evaluation concluded that restoration could result in temporary construction impacts; however, these would be reduced through the appropriate selection of breach size and location to minimize scour effects, and environmental commitments would be implemented to determine if special-status plant species were present and then to buffer them. Furthermore, the range of marsh elevations expected under restoration would create new habitat for special-status plant species. Based on this and the environmental commitments described in Table 3-7 of this document, the SMP EIS/EIR determined that restoration activities would have a less-than-significant impact on special-status plant species.

## Existing Conditions and Proposed Project

Appendix E, *Special-Status Plant Species Surveys*, of this document describes the two special-status plant surveys done on the project site (an early-season and late-season survey). These surveys document no known special-status plant species within the project site. In addition, the project site would be managed as a managed wetland prior to grading for restoration purposes. Managed

wetland activities include disking and other vegetation control measures that greatly reduce the likelihood of special-status plant species inhabiting the project site. Furthermore, the project site would be flooded prior to breaching (Phase 2) the existing natural berm, which would discourage special-status species from colonizing the project site.

The SMP EIS/EIR allows for ECs and BMPs to be implemented for each specific project, depending on the project location, the potential to adversely affect biological resources, and the guidance and requirements set forth by resource agencies through informal and formal consultations. Any adverse effects on special-status plant species attributable to construction activities may require implementation of additional avoidance or mitigation measures. USFWS and CDFW will be consulted, and additional avoidance and mitigation measures may be implemented on a site-specific basis (Reclamation 2011). The proposed project would incorporate select ECs from the SMP EIS/EIR that are relevant to the project as described in Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*, of this document, including:

- Biological Resources Best Management Practices – General Best Management Practices
- Biological Resources Best Management Practices – Worker Training
- Biological Resources Best Management Practices – Special-Status Plant Species Protection
- Biological Monitoring

These ECs and BMPs would verify the locations of special-status plants identified in previous surveys are extant, identify any new special-status plant occurrences, and cover any portions of the project area not previously identified. The extent of mitigation of direct loss of or indirect impacts on special-status plants would be based on these survey results. If found, the locations of special-status plants in proposed construction areas will be recorded using a global positioning system (GPS) unit and flagged. Any special-status plant species observed during surveys will be reported to USFWS and CDFW so the observations can be added to the California Natural Diversity Database (CNDDB).

Plants would be identified and protected by flagging and the presence of a biological monitor during construction activities. In addition, all construction personnel would receive worker awareness training which would include the description and location of any special-status in the project area and the penalties of impacting those individual plants. With the implementation of the environmental commitments identified in Appendix B of this document, the proposed project would result in less-than-significant impacts on special-status plants. Therefore, impacts on special-status plants are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### 3.3.2.3 Wildlife

The SMP EIS/EIR evaluated the potential direct and indirect impacts of restoration activities to the various special-status and other wildlife species, as described in Table 3-7 of this document. The SMP EIS/EIR defined special-status wildlife species as species that are legally protected under the ESA, CESA, or other regulations and species that are considered sufficiently rare by the scientific community to qualify for such listing. The special-status wildlife species evaluated were Suisun SMHM (*Reithrodontomys raviventris*), California clapper rail (*Rallus longirostris obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*), California least tern (*Sterna antillarum browni*), northern harrier (*Circus cyaneus*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*),

short-eared owl (*Asio flammeus*), Suisun song sparrow (*Melospiza melodia maxillaris*), Swainson's hawk (*Buteo swainsoni*), tricolored blackbird (*Agelaius tricolor*), western burrowing owl (*Athene cunicularia hypogea*), white-tailed kite (*Elanus leucurus*), Suisun shrew (*Sorex ornatus sinuosus*), and western pond turtle (*Clemmys marmorata*). These special-status wildlife were included in the SMP EIS/EIR evaluation based on the presence of available habitat in the Suisun Marsh to support them and the known and confirmed presence in the marsh or the high likelihood of presence in the marsh (Table 6.3-2 of the SMP EIS/EIR).<sup>4</sup> The SMP EIS/EIR also included a broad analysis of general waterfowl and shorebird species. The primary restoration activities evaluated in the SMP EIS/EIR that could affect sensitive, special-status, and other wildlife species were grading and excavating activities, breaching of external levees to allow for tidal exchange, and construction of habitat berms. The SMP EIS/EIR qualitatively analyzed the presence of special-status wildlife species within the marsh as well as the types and locations of different habitats in the marsh to determine potential indirect and direct effects of restoration (Reclamation 2011, Section 6.3, *Wildlife*). The analysis assumed that tidal wetland restoration actions, specifically levee breaching, initially would result in the establishment of primarily open-water habitat and also intertidal areas for vegetation and special-status wildlife species (Reclamation 2011, Section 6.3, *Wildlife*). Tidal wetland vegetation would establish as sediment accrues over time, reducing the amount of open water habitat and increasing tidal habitat (Reclamation 2011, Section 6.3, *Wildlife*). Based on the environmental commitments in the SMP EIS/EIR (summarized in Table 3-7 of this document) and the characteristics and conditions of restoration, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on special-status and other wildlife species (Reclamation 2011, Section 6.3, *Wildlife*). This section provides a summary of special-status and other wildlife species as evaluated in the SMP EIS/EIR and under the proposed project.

## Salt Marsh Harvest Mouse

### SMP EIS/EIR

Restoration of tidal wetlands was evaluated in the SMP EIS/EIR to determine if restoration would significantly affect SMHM, identified as endangered under the CESA and the federal ESA. The evaluation documented that construction activities related to converting the habitat in managed wetlands to tidal wetlands would result in a temporary reduction in SMHM habitat. The evaluation included several environmental commitments related to SMHM during construction, such as having a biologist look for SMHM before and during restoration activities. If found, construction activities would stop, then continue once the individual moves from the area. The evaluation included the possibility of removing pickleweed habitat during construction but acknowledged that the restored areas would be expected to provide permanent suitable and sustainable habitat. Furthermore, the timing and scale of construction activities (implemented over the 30-year plan period and not concentrated in a small geographic area or time frame) would constrain impacts on SMHM. In addition, the SMP EIS/EIR allows for project proponents of restoration to propose alternative measures for protecting sensitive species through project-level formal or informal consultations. Based on this and the other environmental commitments in the SMP EIS/EIR (summarized in Table 3-

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<sup>4</sup> A California Natural Diversity Database (CNDDB) was performed in December of 2015 to update and confirm the documentation of special-species in the marsh. Only one other special-status species was identified within a 5-mile radius of the project site that is not identified in Table 6.3-2 of the SMP EIS/EIR: San Joaquin Pocket Mouse (*Perognathus inornatus*). The one occurrence of this species was documented between railroad tracks and Port Chicago Highway in a mixture of grassland and scrub. This species is discussed in this section.



7 of this document), as well as the characteristics and conditions of foraging and breeding habitat, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on SMHM.

### Existing Conditions and Proposed Project

The SMHM is found in numerous locations within the marsh, including tidal wetlands and managed wetlands. Specifically, 13 areas on state lands have been set aside in the marsh, totaling more than 2,500 acres, to conserve habitat for SMHM and other wetland-dependent species (Reclamation 2011, Section 6.3, *Wildlife*). The SMHM preserves are Peytonia Slough; Hill Slough West Ponds 1, 2, 4, and 4A; Hill Slough East, Areas 8 and 9; a portion of Joice Island, the Crescent Unit, a portion of Lower Joice Island; Blacklock; and Grizzly Island Ponds 1 and 15. Mitigation areas are Island Slough Ponds 4 and 7 (Reclamation 2011, Section 6.3, *Wildlife*). Regular trapping of mice occurs in these areas by CDFW and the Department of Water Resources (DWR) to document the presence and number of mice observed and track the sustainability of the population of mice in the marsh. The preserves closest to the project site are Crescent Unit 1 and Pond 15, located in the Grizzly Island Wildlife Area northeast of the project site. In Crescent Unit 1, between 2004 and 2015, CDFW/DWR had a capture efficiency<sup>5</sup> for mice between 6.5% and 18.25%. In Pond 15, between 2004 and 2015, the capture efficiency for mice was between 4.5% and 13.75%. The USFWS Recovery Plan for Tidal Marsh Ecosystems considers a capture efficiency level of 5% or better in some, and 3% or better in most, viable habitat areas to be a primary indicator of a sustainable population.

SMHM are dependent on dense cover, including that provided by pickleweed- or non-pickleweed-dominated mixed wetlands. Mixed stands of native salt marsh vegetation dominated by pickleweed have higher habitat value than pure stands (Conceptual Model 2010). This species has been observed in tidal wetlands and along sloughs as well as within managed wetlands. Suitable habitat for harvest mice in the managed wetlands, in terms of halophytic species, typically occurs at the higher elevations in the wetlands or in wetlands with higher soil salinity. Studies suggest SMHM use a mix of vegetation types and pickleweed, including emergent vegetation, to escape rising water in both tidal wetlands and managed wetlands (Sustaita et al. 2011; Smith 2012). There are approximately 50 acres of tidal emergent wetland located on the project site that support tules (*Schoenoplectus californicus* and *S. acutus*). Most of this is located along the natural berm adjacent to Grizzly Bay (Figure 3-1). There are also approximately 320 acres of managed marsh (non-tidal) that support phragmites (*Phragmites australis*), pickleweed (*Salicornia pacifica*), saltgrass (*Distichlis spicata*), cattails (*Typha angustifolia*), and tules (*Schoenoplectus acutus*). Most of this vegetation is located in the interior of the project site or the easterly side of the natural berm (Figure 3-1). Based on the studies conducted in Suisun Marsh, the presence of mice in nearby areas (Crescent Unit and Pond 15), and the presence of suitable habitat for the SMHM, there is a relatively high likelihood of SMHM to be present on the project site.

The project site is currently a managed wetland. As such, it is flooded until February and drawn down between March and June, per standard management wetland activities authorized by the existing Regional General Permit 3 (Permit #2012-00258N) from the Corps and the associated Biological Opinion from USFWS for SMHM and other listed fish and wildlife species for managed wetland activities. During this time, the mice move to the outer edges of the project site or use tall emergent vegetation within the managed wetland areas to escape the high water levels. During the summer months (June to September/October), approximately 175 acres of the project site is

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<sup>5</sup> Capture efficiency is the number of individual SMHM divided by the total number of trap nights. A trap night is one trap set for one night. During a survey, CDFW usually sets 100 traps for 4 nights, or 400 trap nights.

disturbed with heavy equipment (mowers, dozers, backhoes, discs, excavators) to perform annual maintenance activities and vegetation manipulations. Mowing and discing is used to set back successional stages of desirable vegetation and control invasive species. Discing is limited to 80 acres (20%) of the project site per year. Mowing is used to prepare the pond to provide adequate open-water and foraging opportunities for wintering waterfowl and control invasive phragmites. The high water table and periodic discharges from the CDFW drain sometimes require areas that are repeatedly disced or mowed until the beginning of fall flood-up in mid-October. During the summer management period, SMHM most likely find refuge in the remaining undisturbed and vegetated areas on the site.

The SMP EIS/EIR and the USFWS Programmatic Biological Opinion (USFWS 2013b) allows for ECs and BMPs implemented for each specific project depending on the project location, potential to adversely affect biological resources, and guidance and requirements set forth by resource agencies through informal and formal consultations. Any adverse effects on SMHM attributable to construction activities may require implementation of avoidance or mitigation measures. USFWS and CDFW will be consulted, and avoidance and mitigation measures may be implemented on a site-specific basis (Reclamation 2011). The proposed project would incorporate select ECs from the SMP EIS/EIR that are relevant to the project as described in Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*, of this document including:

- Biological Resources Best Management Practices – General Best Management Practices
- Biological Resources Best Management Practices – Worker Training
- Biological Resources Best Management Practices – Special-Status Wildlife Protection: Mammals
- Biological Monitoring

The following project-specific measures would be implemented to minimize potential effects on SMHM:

- A USFWS-approved biologist, with previous salt marsh harvest mouse monitoring and surveying experience, will identify suitable salt marsh habitat for the mouse and conduct preconstruction surveys for the mouse prior to project initiation.
- Vegetation will be removed from all areas (driving roads, action areas, or anywhere else that vegetation can be stepped on).
- A USFWS-approved biologist with previous salt marsh harvest mouse experience will be on site during construction activities occurring in wetlands. The biologist will document compliance with the project permit conditions and avoidance and conservation measures. The USFWS-approved biologist has the authority to stop project activities if any of the requirements associated with these measures is not being fulfilled. If the USFWS-approved biologist has requested work stoppage because of take of any of the listed species, USFWS and CDFW will be notified within 1 day by email or telephone.
- If a salt marsh harvest mouse is discovered, construction activities will cease in the immediate vicinity of the individual until USFWS is contacted and the individual has been allowed to leave the construction area.
- Disturbance to wetland vegetation (i.e., pickleweed [*Salicornia spp.*]) will be avoided to the extent feasible in order to reduce potential impacts on SMHM habitat. If wetland vegetation (i.e., pickleweed [*Salicornia spp.*]) cannot be avoided, it will be removed by a method approved by

the USFWS and CDFW. The USFWS-approved biologist will be on site to monitor all wetland vegetation removal activities.

The proposed project would minimize SMHM habitat within the footprint of construction while preserving large undisturbed areas of vegetation for SMHM refuge during construction of Phase 1 and Phase 2. The proposed project would disturb only 150 acres within the project site, compared with typical disturbance of 175 acres under managed wetland conditions. During construction by heavy equipment, a qualified biologist with SMHM experience will be on-site and identify SMHM if they are present in or adjacent to work areas and stop construction or remove the species to prevent potential injury or mortality. After construction by heavy equipment and prior to Phase 2, the project site would be pre-flooded and managed to avoid SMHM return to the site and to allow any SMHM present to migrate to higher elevations and tall vegetation within the site. Under operating conditions (i.e., post-breach), there would be no annual disturbance to the marsh plain vegetation that, because of its elevation, is expected to develop into marsh habitats favored by SMHM. In addition, the gradual slope of the habitat levee would provide refuge to SMHM during extreme high tides. The reduction in overall disturbed acres compared to baseline, combined with the environmental commitments identified in Appendix B of this document, would result in less-than-significant impacts on the SMHM. Therefore, impacts on SMHM are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Suisun Shrew

### SMP EIS/EIR

The SMP EIS/EIR evaluated the potential impacts of restoration activities on the Suisun shrew, as described in Table 3-7 of this document. Similar to the potential impacts described above for SMHM, suitable habitat for the Suisun shrew would be temporarily disturbed during the restoration activities. The evaluation included the possibility of removing habitat during construction but acknowledged the restored areas would be expected to provide permanent suitable and sustainable habitat through the use of habitat berms. Furthermore, the timing and scale of construction activities (implemented over the 30-year plan period and not concentrated in a small geographic area or time frame) would constrain impacts on the Suisun shrew. Based on this and the other environmental commitments in the SMP EIS/EIR (summarized in Table 3-7 of this document), as well as the characteristics and conditions of foraging and breeding habitat, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on the Suisun Shrew.

### Existing Conditions and Proposed Project

Suisun shrews occur in tidal wetlands and managed wetlands. This species occupies the same middle and high marsh zone habitat as the SMHM (Williams 1986). Driftwood and organic litter above the high-tide inundation zone may be used for nesting and foraging. Suisun shrews use the higher tidal wetland zones and upland transition zones as escape cover from high tides. This species has been observed in tidal wetlands and in managed wetlands. Occurrences were documented in Grizzly Island, Cordelia Salt Marsh, Cutoff Slough, Hill Slough, and Suisun Slough (Reclamation 2011, Section 6.3). Given the proximity of the project site to Grizzly Island and the fact that Suisun shrews occur in managed wetlands, it is likely that Suisun Shrews may occupy the project site. Suisun shrews use habitat similar to SMHM, so the analysis and environmental commitments discussed above for SMHM would apply to shrews. As such, similar to the evaluation of the proposed project on SMHM, the proposed project would minimize the Suisun shrew habitat within the footprint of construction while

preserving large undisturbed areas of vegetation for Suisun shrew. The proposed project would disturb only 150 acres within the project site, compared with typical disturbance of 175 acres under managed wetland conditions. Under operating conditions (i.e., post-breach), there would be no annual disturbance to the marsh plain vegetation that, because of its elevation, is expected to develop into marsh habitats favored by Suisun shrew. The reduction in overall disturbed acres compared to baseline, combined with the other environmental commitments identified in Table 3-7 of this document, would result in less-than-significant impacts on the Suisun shrew. Therefore, impacts on Suisun shrew are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Bats

### SMP EIS/EIR

The SMP EIS/EIR did not evaluate the potential effects of restoration on various bat species. The SMP EIS/EIR included a short description of various bats that could inhabit Suisun Marsh, including the following:

- Western red bat (*Lasiurus blossevillii*) – State Species of Concern
- Townsend’s big-eared bat (*Corynorhinus townsendii*) – CESA Candidate<sup>6</sup>
- Hoary bat (*Lasiurus cinereus*) – no listed status

Western red bat and hoary bat are known to inhabit primarily trees. The species have had limited observances in the Suisun Marsh. They were dismissed from further evaluation in the SMP EIS/EIR. Townsend’s big-eared bat is known to inhabit structures, as well as other types of habitats, and has one record in Suisun Marsh. Those species that are likely to occur in the study area and be affected by SMP actions were further evaluated in the SMP EIS/EIR. Those species that occur in habitats in the study area but deemed not to be affected by SMP restoration or managed wetland activities were not further evaluated. As such, the bat species known to occur in Suisun Marsh were not evaluated because habitat for these species was presumed not to be affected by typical restoration activities or managed wetland activities.

### Existing Conditions and Proposed Project

As documented in the SMP EIS/EIR, several bat species are known to exist within Suisun Marsh. The project site, including existing structures and the habitat surrounding the project site, is predominantly wetland and, as such, could provide suitable foraging habitat for a range of bat species. The presence of scattered trees and structures on Grizzly Island could provide day and night roost habitat for all species known to occur in the region. As documented in Appendix G, *Bat Habitat Assessment Technical Memorandum*, of this document, species confirmed to occur on Grizzly Island include the foliage-roosting western red bat (*Lasiurus blossevillii*), for which there are both breeding and acoustic records (Pierson et al. 2006; CDFW 2015), and the crevice-roosting Mexican free-tailed bat (*Tadarida brasiliensis*), for which there are acoustic records (Pierson et al. 2006). Both species were documented during the summer. Western red bat roosts in trees and would not be expected to day roost in or on the buildings. Mexican free-tailed bat is often found in human structures. However, given habitat suitability and the project site’s location within the range of many of

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<sup>6</sup> Townsend’s big-eared bat was identified as a California species of special concern in the SMP EIS/EIR and is now a candidate to be listed under the California Endangered Species Act.

Northern California's bat species, a wider variety of species than the two confirmed in Pierson et al. could be expected within the vicinity of the project site, as described in Table 1 of Appendix G. However, as described below, different bat species have different habitat and roosting requirements; thus, it is expected that of the species listed in Table 1 of Appendix G the following could potentially use the structures: pallid bat (*Antrozous pallidus*), big brown bat (*Eptesicus fuscus*), California myotis (*Myotis californicus*), little brown myotis (*Myotis lucifugus*), Yuma myotis (*Myotis yumanensis*), Mexican free-tailed bat (*Tadarida brasiliensis*), and Townsend's big-eared bat (*Corynorhinus townsendii*). Of these species, the pallid bat is a Species of Special Concern (CDFW status) and the Townsend's big-eared bat is a CESA candidate species (CDFW status) (Table 1 of Appendix G).

Different species of bats tend to be associated with different physical roost characteristics, with some species associated almost solely with cracks and crevices, others with cavern-like spaces, and still others with tree foliage (as described in Table 1 of Appendix G). Some species are flexible in their roost structure choices than others and have been found roosting both in crevices and in open cavern-like spaces. During seasonal movements, such as fall migration, bats may be found in atypical roost locations or habitats. Structural characteristics provide one aspect of bat roost habitat; however, temperature is another key element. It may be that temperatures in potential available roost spaces are not conducive to colonial activity in the active season (spring, summer or fall depending on the bat). Finally, level of disturbance may also effect whether bats take up residence and, if so, which species (Appendix G).

The project site includes five existing wooden structures of differing sizes and ages. As such, these structures were evaluated for potential bat habitat in January of 2016 by an ICF biologist. Neither bat sign nor bats were observed in or on any of the existing structures during the assessment. The existing structures create plentiful moderate-quality crevice and cavity habitat. However, where visual examination was possible in and under the potential habitat, there were no signs of colonial bat activity. If there were significant long-term colonial bat activity associated with the buildings during the active season, it would be reasonable to expect some sign of bat activity remaining in undisturbed areas. The caretaker who resides on-site informed the ICF biologist that he had seen only one bat in 20 years. This observation was of a dead bat of unknown species. The caretaker did not remember the time of year at which he found the bat. The potential for colonial maternity roosting cannot be ruled out, but if a maternity roost had been present, no evidence remained at the time of the January habitat assessment. Based on the habitat assessment, and the bats known to exist within the vicinity of Suisun Marsh, the most likely use, if bats are present, would be occasional use by scattered or isolated non-reproductive individuals. Large colonies are generally easier to detect than scattered individuals, and active bats leave more sign and tend to be easier to detect than torpid or hibernating bats. Individual bats roosting in or behind debris or stored items could easily remain undetected given the significant quantity of this type of material limiting full visual access to the existing structures.

While there is no known history of bat use, in or on the existing structures, there is a history of birds nesting on the structures. As such, pre-demolition surveys would be required prior to the demolition to ensure no bat or migratory bird presence. These pre-demolition surveys would be conducted by a qualified biologist, and would occur up to 3 days prior to demolition. This type of survey is similar to those pre-construction surveys required for various species in the SMP EIS/EIR and as described in Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*. The pre-demolition survey for bats would occur in conjunction with nesting bird surveys. Windows and doors of the structures would be kept closed and sealed prior to demolition through the summer to

prevent bats, migratory birds, or other species from inhabiting or roosting in the interior of the structures. Debris piles, material stored in and around the buildings, decorative panels and building furnishings would be removed prior to the preconstruction survey to ensure full survey access. If no live bats or sign (e.g., guano, staining, prey remains, bat carcasses) are found, and if no nests of protected bird species are active on or within the existing structures the structures may be demolished at any time. If live bats or indications of bat use are found, or if active protected bird nests are found, the demolition of the structures would be limited to the beginning of September to the middle of October. This time period avoids the risk to young that would occur if a maternity roost were demolished and avoids disturbing torpid bats during winter when resources are scarce. Thus, this time period is the least sensitive time in the lifecycle of bats. The pre-demolition survey procedure described above would be repeated between the beginning of September and middle of October, and demolition would be postponed until colonial bats or special status bats could be evicted according to appropriate protocols or leave of their own volition.

Although the potential presence of suitable bat habitat on the project site and the planned demolition of the existing structures as part of the proposed project does change what was previously disclosed in the SMP EIS/EIR with respect to bats, it does not create a substantially more severe impact on biological resources, and it does not require substantially different or new mitigation measures. Since bats and indicators of bats were not found in or on any of the existing structures during the habitat assessment and the proposed project incorporates pre-demolition surveys and seasonal restrictions, impacts on bat species would be less than significant. No mitigation is required.

## Raptors

### SMP EIS/EIR

The SMP EIS/EIR evaluated the potential impacts of restoration activities on foraging and breeding habitat used by special-status raptor species, as described in Table 3-7 of this document. Raptors were identified in the SMP EIS/EIR as special-status species and listed as threatened, endangered, or special-status under the federal ESA or the CESA. The document noted that a temporary reduction in foraging habitat could occur for those species that forage in managed wetlands; however, restoration activities would most likely be located throughout the marsh and implemented over the 30-year plan period rather than concentrated in a small geographic area or time frame. Further, it is expected that suitable adjacent areas would continue to provide habitat for raptors between breaching the levee and the establishment of a fully functioning tidal wetland. Breeding season impacts would be avoided. Based on the environmental commitments in the SMP EIS/EIR (summarized in Table 3-7 of this document) and the characteristics and conditions of foraging and breeding habitat, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on special-status raptor species.

### Existing Conditions and Proposed Project

The special-status raptors in the marsh (e.g., western burrowing owl, Swainson's hawk, white-tailed kites) use primarily upland areas and non-managed wetland areas for both foraging and nesting. Most need mature trees or shrubs for nesting and upland habitat for foraging. Therefore, for most special-status raptors, there is a low likelihood that restoration would affect them. However, northern harrier and short-eared owl are ground nesters and could nest in managed wetlands, such as the project site. The environmental commitments identified in the SMP EIS/EIR for the protection

of special-status species including birds and raptors, and in Appendix B of this document, are incorporated into the proposed project. Therefore, impacts on raptors are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Other Special-Status Birds

### SMP EIS/EIR

The SMP EIS/EIR evaluated the potential impacts of restoration activities on various other special-status (non-raptor) bird species, as described in Table 3-7 of this document. The evaluation determined that restoration activities associated with site preparation, grading, and breaching exterior levees could result in impacts on foraging and breeding habitat, depending on the type of bird species evaluated and the location of the activities with Suisun Marsh. However, the SMP EIS/EIR incorporated species-specific restrictions on these types of restoration activities during nesting and breeding season in the marsh, in addition to project design features that would reduce the potential for tidal muting and scour under restored conditions. Based on the environmental commitments in the SMP EIS/EIR for the protection of special-status species including birds, California clapper rail and California black rails, and California least tern (summarized in Table 3-7 of this document) and the characteristics and conditions restoration, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on special-status bird species.

### Existing Conditions and Proposed Project

The Suisun Marsh provides habitat for numerous other special-status (non-raptor) bird species, as summarized by Table 6.3-3 in the SMP EIS/EIR. Tidal habitat within the marsh affords primarily the California clapper rail, California black rail, California least tern, Suisun song sparrow, salt marsh common yellowthroat, and tricolored blackbird locations for resting, foraging, or breeding. Managed wetlands were designed primarily to preserve and enhance habitat for migratory waterfowl; however, they also provide ancillary benefits for other wildlife and wetland-dependent species. Much of the public land within the marsh, including the Grizzly Island Wildlife Area, is managed to conserve and enhance diversity among all wildlife, fish, and special-status species (Reclamation 2011, Section 6.3, *Wildlife*).

The California clapper rail and black rail are permanent residents of Suisun Marsh. The California least tern is a migrating resident of the marsh. Appendix F, *Memorandum Regarding California Clapper Rail, California Black Rail, and California Least Tern*, of this document summarizes known information regarding the presence of the California clapper rail, California black rail, and California least tern on the project site. In general, there is a low probability for these species to exist on the project site because conditions of the site are not preferred habitat for these species and because the project site is outside of the primary known locations of California clapper rails in the marsh (in the western marsh identified by Figure 15 in the SMP EIS/EIR). Specifically, the project site does not support or provide:

- Established vegetative cover, direct tidal circulation, abundant high marsh cover, and an intricate network of tidal sloughs that provide abundant invertebrate populations for clapper rail and black rail habitat
- Sand or fine substrate gravel with sparse vegetation near open water for least turn habitat

In addition, the project site has been managed for more than 5 years as a managed wetland, and during this time there have been no observations of California clapper rail, black rail, or least tern (Appendix F of this document). However, the proposed project incorporates environmental commitments, as referenced in the SMP EIS/EIR and as identified by Appendix B of this document, that if construction activities are necessary during the breeding season, preconstruction surveys for California clapper rail or black rail will be conducted by a USFWS-approved biologist at and adjacent to areas of potential tidal and managed wetlands habitat for California clapper rail and black rail. The surveys will focus on potential habitat that may be disturbed by construction activities during the breeding season to ensure that these species are not nesting in these locations. In addition, no activities will be performed within 300 feet of an active least tern nest during the least tern breeding season, April 15 to August 15 (or as determined through surveys). The environmental commitments identified in the SMP EIS/EIR, and in Appendix B of this document, are incorporated into the proposed project. Therefore, impacts on the California clapper rail, black rail, and least tern are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

Salt marsh common yellowthroat, Suisun song sparrow, and tricolored blackbird are permanent residents of the marsh and the greater Sacramento-San Joaquin Valley (Reclamation 2011, Section 6.3). The common yellowthroat and song sparrow typically occur in tidal and brackish marshes and managed wetlands in the marsh and favor habitat characterized by bulrush, cattail, and other emergent marsh vegetation (Reclamation 2011, Section 6.3). The tricolored blackbird is typically found in dense stands of tule, cattail, Himalayan blackberry thickets, and fallow fields. Suitable nesting habitat in extensive stands of emergent wetland vegetation is associated with tidal and brackish wetlands and managed wetlands. The project site does have some tidal emergent vegetation, located primarily on the natural berm adjacent to Grizzly Bay, which includes tule and bulrush. As such, the environmental commitments identified in the SMP EIS/EIR EIR for the protection of special-status wildlife species including birds, and in Appendix B of this document, are incorporated into the proposed project. The following project-specific measures would be implemented to minimize potential impacts:

- All woody and herbaceous vegetation will be removed from construction areas (earthwork areas), during the nonbreeding season (September 1–February 1) to the extent feasible, to minimize effects on nesting birds. If woody and herbaceous vegetation removal occurs during the breeding season, a qualified biologist will survey the construction area for active nests and young migratory birds immediately before removal activities

Therefore, impacts on salt marsh common yellowthroat, Suisun song sparrow, and tricolored blackbird are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Waterfowl and Shorebirds

### SMP EIS/EIR

The SMP EIS/EIR evaluated the potential impacts of restoration activities on various waterfowl and shorebirds, as described in Table 3-7 of this document. The evaluation determined that restoration activities associated with site preparation, grading, and breaching exterior levees could result in impacts on foraging and breeding habitat, depending on the type of bird species evaluated and the location of the activities with Suisun Marsh. In addition, the conversion of managed wetlands to tidal wetlands would result in a reduction of managed wetland habitat for waterfowl use. However, the



SMP EIS/EIR incorporated species-specific restrictions on these types of restoration activities during nesting and breeding season in the marsh. Based on the environmental commitments in the SMP EIS/EIR (summarized in Table 3-7 of this document) and the characteristics and conditions for restoration, the SMP EIS/EIR determined that restoration would have a less-than-significant impact on waterfowl and shorebird species.

## Existing Conditions and Proposed Project

The Suisun Marsh provides nesting, foraging, and wintering habitat for waterfowl, and the marsh is a key waterfowl wintering area in the Pacific Flyway. The large expanses of managed wetlands provide nesting and foraging habitat for resident and migratory species. Table 6.3-5 in the Suisun EIS/EIR describes the types of waterfowl that use the managed wetlands for foraging, resting, and breeding. These include dabbling ducks, diving ducks, geese, and swans.<sup>7</sup> The value of individual managed wetlands to waterfowl production and overwintering habitat varies, depending on water management practices, soil salinity, and the associated plant communities. The goal of most managed wetlands in Suisun Marsh is to provide wintering habitat for waterfowl. These waterfowl also use tidal wetlands and bays and sloughs in the marsh for foraging and loafing (Reclamation 2011, Section 6.3, *Wildlife*).

The tidal wetlands and managed wetlands provide habitat for several species of shorebirds, particularly migrating and overwintering birds. The value of the managed wetlands to shorebirds varies, depending on water level, salinity, and the vegetation communities present. The common shorebird species that occur in the marsh and the habitats in which they occur are identified in Table 6.3-6 of the SMP EIS/EIR and include probers (i.e., birds that probe wet soil with their beaks for food) and sweepers (i.e., birds that sweep through standing or running water with their beaks for food). Managed wetlands provide primarily foraging and loafing habitat for shorebirds, with the exception of killdeer, American avocet, and black-necked stilt, which are also known to use managed wetlands for breeding. Shorebirds typically prefer tidal flats for foraging, and the presence of vegetative cover (as in managed wetlands during certain times of the year) reduces the amount of suitable habitat for both probers and sweepers (Reclamation 2011, Section 6.3, *Wildlife*).

Restoration of the proposed project site would convert approximately 150 acres of managed wetlands to tidal wetlands on the entire 420-acre project site. The Grizzly King property and the Grizzly Island Wildlife Unit comprise approximately 9,200 acres of managed wetlands immediately adjacent to the project site and provide the same habitat benefits to waterfowl and shorebird species as the project site. In addition, there would be approximately 52,000 acres of managed wetlands in the entire marsh that shorebirds and waterfowl would continue to use. As a result of the proposed project, less than 1% (approximately 0.8%) of the total managed wetland habitat in Suisun Marsh would be converted to tidal habitat. Further, tidal habitat provides both foraging and loafing value to both waterfowl and shorebirds, as described in Tables 6.3-5 and 6.3-6 in the SMP EIS/EIR. The environmental commitments identified in the SMP EIS/EIR, and in Appendix B of this document, are incorporated into the proposed project. Therefore, impacts on waterfowl and shorebirds are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

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<sup>7</sup> Taxonomically, migratory waterfowl that use Suisun managed wetlands for wintering habitat are dabbling ducks, diving ducks (or bay ducks), sea ducks, stiff-tailed ducks, geese, and swans (Conceptual Model 2010). For the purpose of this document, diving ducks will include those species that are taxonomically considered diving ducks as well as sea ducks and stiff-tailed ducks.

## Other Wildlife

### SMP EIS/EIR

The SMP EIS/EIR did not evaluate the potential effects of restoration on the San Joaquin pocket mouse. However, given the criteria used in the analysis to evaluate species based on the presence of available habitat in the Suisun Marsh to support them, as well as the known and confirmed presence in the marsh or the high likelihood of presence in the marsh, the mouse would most likely not have been incorporated in the evaluation because it typically occurs in upland areas characterized by grasses, and it has been documented only once in the Suisun Marsh area. Its documentation was in an upland area, and it is not a federally or state-listed species.

### Existing Conditions and Proposed Project

San Joaquin pocket mouse is typically found in upland/grassland habitat with sandy areas in which to dig burrows (CDFW 2016). The species favors dry, open, grassy or weedy ground and arid annual grasslands, savanna, and desert-shrub associations with sandy washes or finely textured soil (IUCN 2016). This information is consistent with the CNDDDB-documented location (i.e., upland by railroad tracks). The project site is a managed wetland with primarily damp and wet clay and silty soils, with limited upland habitat and sandy, dry soils. Therefore, it is expected that the San Joaquin pocket mouse would have a low probability of existing on the project site. However, as described above, the project site would have a footprint of disturbance less than that of the baseline. It also includes a habitat berm that could provide upland habitat that would be more favorable for the pocket mouse when compared to baseline conditions. Therefore, impacts on San Joaquin pocket mouse are within the scope of the impacts that were identified in the SMP EIS/EIR and are less than significant. No mitigation is required.

## 3.3.3 Air Quality, Greenhouse Gases, and Climate

The previously certified SMP EIS/EIR evaluated restoration construction (short-term) and operational (long-term) emissions by using a specific equipment list for restoration activities, the approved model for evaluating impacts at that time (URBEMIS), and the draft Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) thresholds for air quality pollutants. The SMP EIS/EIR also evaluated air quality showing combined restoration activities and managed wetland activities to identify a potential worst-case scenario for air quality. Generally, the restoration activities analyzed in the SMP, described in Table 3-7 of this document, assumed the following: grading, improving levees, building channels and islands, and levee breaching. The assumed equipment, as listed in Table 5.7-8 of the SMP EIS/EIR and described in Table 3-7 of this document, is as follows: tractors/loaders/backhoes, rubber-tired dozers, excavators, graders, and box scrapers. The impact analysis determined that less-than-significant impacts (without mitigation) would occur with respect to the following criteria pollutant emissions: reactive organic gas (ROG), carbon monoxide (CO), particulate matter 10 microns in diameter or less (PM10), particulate matter 2.5 microns in diameter or less (PM2.5), and carbon dioxide (CO<sub>2</sub>). The impact analysis determined that less-than-significant impacts with mitigation incorporated would occur with respect to the following criteria pollutant emissions: oxides of nitrogen (NO<sub>x</sub>). The SMP EIS/EIR identified no significant and unavoidable air quality impacts with respect to restoration activities.

Since certification of the SMP EIS/EIR, the BAAQMD finalized the CEQA thresholds for air quality, which are the same as those used and compared in the SMP EIS/EIR, except the sulfur dioxide CEQA threshold, which BAAQMD did not include in its final CEQA Guidelines (2011). Also, since certification of the SMP EIS/EIR, the model used to evaluate air quality impacts, URBEMIS, has been replaced; URBEMIS is no longer used. Currently, CalEEMod is used to evaluate impacts in place of the older URBEMIS model that was used in the SMP EIS/EIR analysis. CalEEMod differs from URBEMIS in that CalEEMod uses updated emission factors, land use data, and possible mitigation measures. Because CalEEMod is the standard now with which to evaluate air quality emissions, it was used to generate estimates of emissions for the Tule Red restoration project. The BAAQMD still designates Solano County as a nonattainment area for the following pollutants under state air quality standards, as identified in the SMP EIS/EIR: ozone, PM<sub>2.5</sub>, and PM<sub>10</sub>. Solano County is also in nonattainment for the following pollutants under national air quality standards, as identified in the SMP EIS/EIR: ozone and PM<sub>2.5</sub>.

### 3.3.3.1 Restoration Construction

As a worst-case scenario, the SMP EIS/EIR combined site preparation (SMP Restoration Phase I) and levee breaching (SMP Restoration Phase II) emissions into a total daily emissions value, because it is possible that the two separate construction phases could occur at the same time. All construction equipment was assumed to operate for 8 hours per day of construction activities. The evaluation of combined SMP Restoration Phase I and Phase II construction activities resulted in less-than-significant temporary increases in unmitigated emissions of ROG, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and CO<sub>2</sub>. However, unmitigated emissions from the combined SMP Restoration Phase I and Phase II construction activities exceeded the BAAQMD construction threshold for NO<sub>x</sub>. Mitigation measures AQ-MM-1 through AQ-MM-3 were incorporated in the SMP EIS/EIR to reduce the total restoration construction NO<sub>x</sub> emissions to less than significant.

Implementation of the proposed project would require more total construction equipment than is assumed in the SMP EIS/EIR analysis, as described in Chapter 2, *Project Description*, of this addendum; however, the site preparation phase of the proposed project (Phase 1) and the breaching of the natural exterior berm (Phase 2) would not take place simultaneously, as described in the SMP EIS/EIR. The SMP EIS/EIR estimated construction equipment for the SMP Restoration Phase I construction activities is as follows: one tractor/loader/backhoe, one rubber-tired dozer, one excavator, one grader, and one box scraper. For the proposed project Phase I, three construction equipment scenarios were evaluated, each with a different mix of scrapers, dozers, excavators, graders, backhoes, front-end loaders, and water trucks. The mix of equipment that would actually be used would depend on the activities that would occur within the phase and the conditions of the project site. As such, these three scenarios are evaluated to disclose the potential air quality emissions that could be generated and to ensure that construction emissions would be below the emissions threshold. The different equipment scenarios are presented in Tables 3-4a through 3-4c, including equipment horsepower, engine tier level, hours per day of use, number of days of use, and number of pieces of equipment for each type of equipment. These scenarios include the equipment that would be needed to construct the pooling area around the CDFW drain. All proposed construction equipment for Phase 1 are assumed to incorporate Level 1 diesel particulate filters and 40% oxidative catalyst reductions, consistent with mitigation required in the SMP EIS/EIR analysis. All scrapers, dozers, and excavators would have a Tier 3 or better engine.

**Table 3-4a. Proposed Project, Phase 1 Construction Scenario A**

Equipment Type (horsepower [hp]): Tier Level	Use (hours/day)	Duration (working days)	Pieces of Equipment
Scraper (500 hp): Tier 3	10	60	4
Dozer (150 hp): Tier 3	10	60	2
Excavator (328 hp): Tier 3	10	60	2
Grader (174 hp): Tier 2	4	80	1
Backhoe (93 hp): Tier 2	2	80	1
Front-End Loader (88 hp): Tier 2	2	80	1
Water Truck	NA	60	1

Table 3-4b. Proposed Project, Phase 1 Construction Scenario B

Equipment Type (hp): Tier Level	Use (hours/day)	Duration (working days)	Pieces of Equipment
Scraper (500 hp)			
Tier 3	8	50	4
Tier 4 Interim	8	50	4
Dozer (150 hp): Tier 3	8	50	2
Excavator (328 hp): Tier 3	8	50	3
Grader (174 hp): Tier 2	4	50	1
Backhoe (93 hp): Tier 2	2	50	1
Front-End Loader (88 hp): Tier 2	2	50	1
Water Truck	NA	50	1

**Table 3-4c. Proposed Project, Phase 1 Construction Scenario C**

Equipment Type (hp): Tier Level	Use (hours/day)	Duration (working days)	Pieces of Equipment
<b>Scraper (500 hp)</b>			
Tier 3	10	40	1
Tier 4 Interim	10	40	7
<b>Dozer (150 hp)</b>			
Tier 3	10	40	2
Tier 4 Interim	10	40	1
<b>Excavator (328 hp)</b>			
Tier 3	10	40	1
Tier 4 Interim	10	40	2
Grader (174 hp): Tier 2	4	40	1
Backhoe (93 hp): Tier 2	2	40	1
Front-End Loader (88 hp): Tier 2	2	40	1
Water Truck	NA	50	1

The SMP EIS/EIR estimated construction equipment for SMP Restoration Phase II construction activities as follows: one excavator. For the proposed project Phase 2 analysis, one construction equipment scenario is evaluated and shown in Table 3-4d. This construction equipment scenario includes the equipment needed for the demolition of the existing on-site structures (total square footage is approximately 3,600) and the breach of the existing natural berm. This analysis incorporates all BAAQMD best management practices (BMPs) and AQ-MM-2 and AQ-MM-3, as identified in the SMP EIS/EIR and listed in Table 3-7 of this document.

**Table 3-4d. Proposed Project, Phase 2 Construction Equipment**

Equipment Type (hp): Tier Level	Use (hours/day)	Duration (working days)	Pieces of Equipment
Dozer (150 hp): Tier 3	8	30	2
Excavator (328 hp): Tier 4 Interim	8	30	2
Backhoe (93 hp): Tier 3	8	30	2
Front-End Loader (88 hp): Tier 3	8	30	2
Water Truck	NA	30	2
Dump Trucks	NA	15	> 20 tucks (40 trips)

### Phase 1

The SMP EIS/EIR estimated mitigated restoration activities (SMP Restoration Phase I and Phase II) construction emissions to be below BAAQMD thresholds for all criteria pollutants. After implementation of mitigation measures AQ-MM-1 through AQ-MM-3, the impact from construction-related emissions was determined to be less than significant in the SMP EIS/EIR.

As shown below in Tables 3-5a through 3-5c, construction-related criteria pollutant emissions for Phase I construction Scenarios A through C are all below BAAQMD thresholds for all criteria pollutants under all three Phase 1 scenarios. Installation of a spray aeration structure on the existing CDFW drain would use the existing pipe outfall and basin and would require no additional earthwork or construction equipment. Because no additional construction equipment would be required, this would not add construction-related emissions to Phase 1 total emissions. The equipment associated with constructing a pooling area to control the discharge of the CDFW drain water into the restoration area is incorporated into the construction equipment lists in Tables 3-4a through 3-4c. Because the construction activities for constructing the pooling area are included with restoration activities, emissions are thus included in emissions results, as shown above in Tables 3-5a through 3-5c. Impacts related to air quality and greenhouse gases (GHGs) are within the scope of the impacts that were identified in the SMP EIS/EIR, below existing BAQMD thresholds, and remain less than significant. As discussed above, mitigation measures AQ-MM-2 and AQ-MM-3, as described in the SMP EIS/EIR, were incorporated in this analysis and would be implemented for the proposed project.

**Table 3-5a. Proposed Project, Phase 1 Scenario A Emissions (pounds/day)**

	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	Exhaust PM10	Exhaust PM2.5	CO <sub>2</sub> e (MT/yr)
Emissions	3.8	43.9	83.1	0.1	2.1	2.1	429.0
BAAQMD Thresholds	54	54	NA	NA	82	54	NA
Exceed BAAQMD Thresholds?	No	No	NA	NA	No	No	NA

CO<sub>2</sub>e (MT/yr) = metric tons of carbon dioxide equivalent per year.

**Table 3-5b. Proposed Project, Phase 1 Scenario B Emissions (pounds/day)**

	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	Exhaust PM10	Exhaust PM2.5	CO <sub>2</sub> e (MT/yr)
Emissions	4.7	52.0	117.2	0.2	2.0	1.9	508.1
BAAQMD Thresholds	54	54	NA	NA	82	54	NA
Exceed BAAQMD Thresholds?	No	No	NA	NA	No	No	NA

**Table 3-5c. Proposed Project, Phase 1 Scenario C Emissions (pounds/day)**

	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	Exhaust PM10	Exhaust PM2.5	CO <sub>2</sub> e (MT/yr)
Emissions	5.0	52.6	150.4	0.3	1.1	1.1	517.3
BAAQMD Thresholds	54	54	NA	NA	82	54	NA
Exceed BAAQMD Thresholds?	No	No	NA	NA	No	No	NA

AQ-MM-1, which would limit construction activity during restoration to a single parcel to reduce NO<sub>x</sub> emissions, is not needed for the Tule Red project because all three Phase 1 construction equipment scenarios would result in NO<sub>x</sub> emissions that would be below the BAAQMD NO<sub>x</sub> threshold. Therefore, impacts related to air quality are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

## Phase 2

The SMP EIS/EIR estimated mitigated combined restoration activities (SMP Restoration Phase I and Phase II) construction emissions to be below BAAQMD thresholds for all criteria pollutants. Thus, after implementation of mitigation measures AQ-MM-1 through AQ-MM-3, the impact from construction-related emissions was determined to be less than significant in the SMP EIS/EIR.

As shown below in Table 3-5d, construction-related criteria pollutant emissions for the proposed project Phase 2 activities are below BAAQMD thresholds for all criteria pollutants for the equipment summarized in Table 3-4d, including approximately 20 dump trucks. Given the relatively small square footage (approximately 3,600 square feet) expected to be demolished, fewer than 20 dump trucks (approximately 40 truck trips) would be needed to haul the material away. In addition, mitigation measures AQ-MM-2 and AQ-MM-3, as described in the SMP EIS/EIR, are incorporated into this analysis. Therefore, impacts related to air quality are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

**Table 3-5d. Proposed Project, Phase 2 Construction Emissions (pounds/day)**

	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	Exhaust PM10	Exhaust PM2.5	CO <sub>2e</sub> (MT/yr)
Emissions	1.1	12.1	28.5	< 0.1	0.6	0.6	66
BAAQMD Thresholds	54	54	NA	NA	82	54	NA
Exceed BAAQMD Thresholds?	No	No	NA	NA	No	No	NA

### 3.3.3.2 Combined Restoration and Management Activities

The SMP EIS/EIR estimated mitigated restoration and management activities are combined because it is possible that the construction activity associated with restoration and management activities could occur at the same time. Emissions associated with restoration, management activities that would increase in frequency, and new management activities were summed together to reflect the potential worst-case construction activity overlap. Mitigated construction emissions for the combined restoration and management activities were shown to exceed BAAQMD thresholds for NO if all the restoration and management activities were to happen concurrently. Therefore, in addition to mitigation measures AQ-MM-1 through AQ-MM-3, AQ-MM-4 was required to reduce this impact to less than significant in the SMP EIS/EIR.

As discussed above, AQ-MM-2 and AQ-MM-3, as described in the SMP EIS/EIR, were incorporated into this analysis and would be implemented during the proposed project. As a result of adherence to AQ-MM-4, the project proponent would limit restoration and management activity so that the equipment used for Tule Red would include the equipment described in Tables 3-4a through 3-4d to ensure NO<sub>x</sub> emissions remain below the BAAQMD threshold during restoration. Although this is a

change to AQ-MM-4 as it is written in the SMP EIS/EIR, the intent of the mitigation measure is to ensure NO<sub>x</sub> remains below the BAAQMD threshold while considering the construction equipment type, mix, and numbers used during restoration. The construction equipment type, mix, and numbers identified in Tables 3-4a through 3-4d quantitatively show that NO<sub>x</sub> emissions would not exceed the BAAQMD threshold; therefore, the change in mitigation measure is appropriate for the proposed project and would not result in a substantive change or a change in the severity of the impact or determination previously made in the SMP EIS/EIR. Furthermore, the project site acreage that would be disturbed when compared to baseline conditions would be reduced. Typically, 175 acres of the project site is managed as managed wetlands, requiring construction equipment throughout the year and especially during the summer. However, under the proposed project, only 150 acres would be disturbed during Phase 1, thus resulting in an overall reduction in the area of disturbance. In addition, between proposed project Phases 1 and 2, there would be reduced construction equipment activity when compared to baseline conditions because the site would be managed to promote vegetation growth or would be pre-flooded prior to the breach. Finally, management activities for the project site would be reduced because the project site would cease to be a managed wetland once Phase 2 was complete; heavy construction equipment would no longer be used during the summer. Therefore, impacts related to air quality are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### 3.3.3.3 Restoration Operation

Operational emissions for the SMP were not evaluated because the activities associated with restoration and management were considered construction activities.

Once the project site is restored, habitat establishment would occur on the site starting in approximately 2018. Limited maintenance, monitoring, and management tasks would occur during this time, including development of tules and other native marsh vegetation, weed control within the habitat berm, inspections for erosion or settling of habitat level, and patrolling for trash and trespass. Long-term management would include all habitat establishment activities, periodic biological monitoring of the project area, and periodic mapping of the marsh and channel.

Emissions related to restoration operation should be minimal given the lack of heavy equipment activity and minimal number of worker vehicle trips. In addition, management activities on the project site would cease; thus, emissions would be reduced when compared to baseline because heavy equipment, which is currently used to manage the wetland, would no longer be used during the summer. Impacts related to air quality and GHGs would be less than significant. No mitigation is required.

### 3.3.3.4 Greenhouse Gases and Climate Change

The SMP EIS/EIR estimated that approximately 276.3 tons of CO<sub>2</sub> per year would be generated from restoration activities alone; however, this estimation was generated using the outdated URBEMIS emissions model. Based on emissions modeling using the current CalEEMod emissions model, which generally has higher GHG emission factors than the URBEMIS emissions model, carbon dioxide equivalent (CO<sub>2</sub>e) emissions generated by the proposed project are expected to range from 429 metric tons per year (MT/yr) to 517 MT/yr for Phase 1 Scenarios A through C and approximately 66 MT/yr for Phase 2. As identified in the SMP EIS/EIR, construction emissions would be offset though changes in net GHG sources and sinks, because the Tule Red project site is a tidal restoration habitat project



and would become a sink for CO<sub>2</sub>. In addition, the CO<sub>2</sub> emissions currently generated every year under the managed wetland activities would no longer occur (estimated with URBEMIS at 322 MT/yr), further reducing CO<sub>2</sub>e emissions associated with the proposed project.

The proposed project is expected to regularly accrete sediment on the existing natural exterior berm (as it has been doing for several decades), which would reduce the likelihood of continual inundation associated with sea level rise (Appendix D.2, Table 5.1). Grizzly Bay has a high suspended sediment load; the adjacency of the project site and direct connection to the bay is ideal for accommodating sea level rise. The existing elevations of the managed marsh (between 3 and 5.5 feet NAVD88) would be ideal for capturing sediment deposited from the adjacent Grizzly Bay once the channels and breach to the bay open the site up to tidal influence. Sediment deposition at the edge of the bay has led to advancement of the shoreline at a current rate of 6 to 10 feet per year; modeling by NHC indicates sediment will deposit on the marsh plain at rates that exceed sea level rise (Appendix D.2). In addition, the gradually sloping wetland upland transition zone along the habitat berm would provide an elevation gradient over which tidal wetlands could shift upslope when floodwaters rise. The stability of the habitat levee should minimize future management requirements, even with elevated sea levels.

Emissions and impacts associated with GHGs and climate change under the proposed project are within the scope of the emissions impacts that were identified in the SMP EIS/EIR and less than significant. No mitigation is required.

### 3.3.4 Cultural Resources

#### SMP EIS/EIR

The SMP EIS/EIR determined that there would be significant and unavoidable impacts on cultural resources due to inundation of certain lowland and marsh areas, construction in unsurveyed areas, and potential damage to character-defining features of the Montezuma Slough Rural Historic Landscape.

#### Existing Conditions and Proposed Project

The proposed project would not result in significant and unavoidable impacts on cultural resources located in the Montezuma Slough Rural Historic Landscape or near Mein's Landing because the project site is not located near these areas. Therefore, the mitigation measures in the SMP EIS/EIR with respect to these resources are not applicable to the proposed project, and impacts would be less than significant.

Of the 24 previously recorded cultural resources identified in the SMP EIS/EIR, 13 are in Region 4 of the marsh, the location of the project site (Reclamation 2011, Table 7.7-10). All but two are recommended as National Register of Historic Places/California Register of Historic Resources (NRHP/CRHR) ineligible for not meeting state and federal cultural significance criteria. The remaining two resources are identified as undetermined but are not near the project site; these are a lowland grassland area and the Montezuma wetlands flume structure (Reclamation 2011, Table 7.7-10).

A cultural resources evaluation of the project area was conducted in June 2015 according to the standards and criteria identified in the National Register of Historic Places (36 CFR 60.4), National Historic Preservation Act (36 CFR 800.4), State CEQA Guidelines (14 CCR 15064.5[a]) and National Register Bulletin 15 prepared by Andrus and Shrimpton (1997 revised 2002) (Appendix H, *Cultural*

*Resources Report*). As part of this evaluation, a literature review and archeologist-led field reconnaissance of the project site was performed. The literature review was conducted by the Northwest Information Center of the California Historical Resources Information System at Sonoma State University, and the results of this review indicated that the project area has no known cultural resources. The archeologist-led field reconnaissance indicated no evidence of prehistoric occupation or use of the project site. The cultural resources study concluded, based on the literature review and the field reconnaissance, that the potential for buried archaeological sites in the project area is low because of heavy sedimentation that has buried older surfaces to a considerable depth. The only area of the project site where deep excavation (up to 15 feet) could occur is in the northwest where a channel would be cut to breach the existing natural berm and restore tidal action. This is an area that was part of Grizzly Bay before the 1850s gold rush, and it is unlikely that prehistoric resources would be present (Appendix H, *Cultural Resources Report*). Although there is a low potential for unknown significant cultural resources to existing on the project site because of the unique characteristics of sediment accretion on the site and the fact that the site was part of Grizzly Bay until the mid-1950s, the proposed project would incorporate the following, similar to the conditions found in CUL-MM-1 and CUL-MM-5 of the SMP EIS/EIR, tailored to the project specific conditions and the results of the cultural resources evaluation:

- Prior to ground-disturbing activities in restoration areas, the State and Federal Contractors Water Agency (SFCWA) will conduct a cultural resources inventory of the restoration area according to the standards cited in:
  - a. The implementing regulations for Section 106 of the NHPA (36 CFR 800.4).
  - b. The State CEQA Guidelines (14 CCR 15064.5[a]).
  - c. Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (48 Federal Register [FR] 44716-44742).
  - d. The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act (including the Guidelines for the Treatment of Cultural Landscapes).
  - e. Applicable NRHP bulletins and National Park Service technical briefs (Andrus and Shrimpton 1997; Birnbaum 1994; McClellan et al. 1995).
- If any cultural resources are determined to be historic properties and ground-disturbing activities are found to result in adverse effects, the Corps or SFCWA will resolve the effects in accordance with Section 106 of the National Historic Preservation Act (NHPA) or CEQA, as applicable.

In addition, the proposed project would incorporate the following environmental commitment for the Inadvertent Discovery of Unknown Cultural Resources. This is identified by the SMP EIS/EIR, with the inclusion of the bolded text for the proposed project.

- If any previously unknown historic or archeological artifacts are discovered while accomplishing the authorized work, the landowner must stop work within 100 feet of the find immediately and notify the SFCWA and the Corps. All construction personnel will leave the area. Vehicles and equipment will be left in place until a qualified archaeologist identifies a safe path out of the area. The on-site supervisor will flag or otherwise mark the location of the find and keep all traffic away from the resource. The on-site supervisor immediately will notify the lead state or federal agency of the find. The activity is not authorized until the requirements of Section 106 of the NHPA have been satisfied.

The cultural resources study described the existing structures on the site. It concluded that, because of the age, condition, characteristics, location, and use, they do not meet any of the criteria of a significant historic cultural resource (Appendix H, *Cultural Resources Report*). Therefore, the existing on-site structures are not considered significant historic cultural resources.

The Native American Heritage Commission (NAHC) was contacted for a sacred lands review, which indicated that no properties in the vicinity of the project are listed on the sacred lands file. The Cortina Band of Indians and the Yocha Dehe Wintun Nation were contacted to request information and/or comment. The Yocha Dehe replied that the project is within their aboriginal territory and claim authority over the Native American resources of the area. They also requested additional information regarding the project (Appendix H). Although there is a low potential for human remains to exist on the project site because of the unique characteristics of sediment accretion on the site and the fact that the site was part of Grizzly Bay until the mid-1950s, the proposed project would incorporate the following environmental commitment, as described in the SMP EIS/EIR for the Inadvertent Discovery of Unknown Cultural Resources:

- If human remains of Native American origin are discovered during ground-disturbing activities on non-federal land, SFCWA or the Corps must comply with state laws related to the disposition of Native American burials, which fall within the jurisdiction of the NAHC (Public Resources Code [PRC] 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, SFCWA or the Corps will not allow further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:
  - f. The Solano County Coroner has been informed and has determined that no investigation of the cause of death is required, and
  - g. If the remains are of Native American origin, the descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work regarding the means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods, as provided in PRC 5097.98; or
  - h. The NAHC is unable to identify a descendant or the descendant failed to make a recommendation within 48 hours after being notified by the NAHC.
  - i. If any previously unknown historic or archeological artifacts are discovered while accomplishing the authorized work, the landowner must stop work immediately and notify the Corps. The activity is not authorized until the requirements of Section 106 of the NHPA have been satisfied.

As determined by the cultural resources evaluation, there are no significant cultural resources in the project area. Impacts on cultural resources under the proposed project are within the scope of the impacts that were identified in the SMP EIS/EIR and less than significant. No mitigation is required.

### 3.3.5 Land Use

#### SMP EIS/EIR

The SMP EIS/EIR determined there would be less-than-significant impacts on land uses because implementation of the plan, including restoration projects, would not alter existing land use patterns; conflict with existing land use plans, policies, and regulations; or conflict with any applicable habitat conservation plan or natural community conservation plan, as described in Table 3-2. Therefore, no mitigation was required.

## Existing Conditions and Proposed Project

Implementing the proposed project also would not alter the existing land use patterns; conflict with existing land use plans, policies, and regulations; or conflict with the existing SMP, as described in Table 3-7. The project area land use designation is “marsh” and “resource conservation overlay” (Solano County 2008). The construction and restoration activities associated with the proposed project would be consistent with these land use designations. The proposed project is a restoration project that is allowed for under the SMP, and its purpose and objectives, design, location, and implementation are consistent with the SMP, as described in Chapter 2, Section 2.3 *Proposed Project*. Therefore, impacts on land use due to implementation of the proposed project would remain less than significant, and no mitigation is required.

The Delta Plan became effective with legally enforceable regulations on September 1, 2013 (Delta Stewardship Council 2013). The proposed project meets the criteria of a “covered action,” as defined by the Delta Plan (described in Table 3-7) and PRC 21056, and therefore is subject to the policies of the Delta Plan. Compliance with Delta Plan policies is required for proposed covered actions. All Delta Plan policies were reviewed, and those specific to restoration projects were deemed applicable to the proposed project and selected to be included in this analysis. In addition, those policies and recommendations identified by the Delta Stewardship Council letter to the project proponent are included in this analysis. Recommendations are not regulatory in nature and are provided by the Delta Stewardship Council to work toward coequal goals for the delta, as identified in the Delta Plan. Given that the proposed project would not conflict with applicable Delta Plan policies, conclusions regarding land use impacts have not changed relative to those disclosed in the SMP EIS/EIR impact analysis. Therefore, impacts would remain less than significant, and no mitigation is required. The applicable Delta Plan policies and recommendations and consistency between those policies and recommendations and the proposed project are discussed below.

## Policies

### **DP GP 1: Detailed Findings to Establish Consistency with Delta Plan—Covered Actions Must Use Best Available Science**

The proposed project would be consistent with Delta Plan policy GP 1. The project site was selected for its location adjacent to a tidal marsh habitat to the north; it is a naturally accreting site and has not been previously diked or managed. It was also selected because of its proximity and connection to Grizzly Bay, a documented location of delta smelt. The project design has used best available science to refine the conceptual plan and determine the appropriate design to support protected and native fish species (e.g., delta smelt). The project design supports the following conceptual models prepared for the SMP:

- Tidal Marsh Conceptual Model – Connected to sub-tidal and other tidal marsh habitats, providing export of vegetation, invertebrates, algae, phytoplankton, and zooplankton to support the foodweb.
- Levee Conceptual Model – Supports levee stability and protects adjacent managed wetlands from uncontrolled inundation.
- Mercury Water Quality Conceptual Model – Conversion from managed marsh decreases annual methylmercury “flush” from fall flood-up.
- Organic Matter Conceptual Model – Provides an additional source of organic material processes and export.

In addition, the selection of the project location and design features incorporates the most recent species data available, accurate elevation data taken from the site, and information from relevant studies of foodweb productivity and tidal marsh occupation by native species (UC Davis 2015). The proposed project design has been refined through repeated collaboration with multiple agencies, entities, and scientists. Specifically, the following have been consulted:

- **Suisun Marsh Adaptive Management Advisory Team (AMAT)** is an advisory team composed of technical staff personnel from CDFW, DWR, Suisun Resource Conservation District (SRCD), Reclamation, USFWS, and the Delta Stewardship Council, with invitations to other entities to participate as appropriate. Project proponents can use the AMAT and their knowledge of the marsh for project development, design, and support and as a forum to coordinate and cooperate for the benefit of the overall restoration goals. AMAT was consulted on June 3, 2015. Attendees and contributors included:
  - Cody Aichele, BCDC
  - Darcy Austin, DSC
  - Bob Batha, BCDC
  - Steve Chappell, SRCD
  - Maggie Christman, DSC
  - Jessica Davenport, DSC
  - Sarah Estrella, CDFW
  - Cliff Feldheim, DWR
  - Kristin Garrison, DWR
  - Lauren Hastings, DSP
  - Tiffany Heitz, USFWS
  - XDaniel Huang, DSC
  - Karen Kayfetz, DSP
  - Gregory Krzys, USBR
  - Joe Laclair, BCDC
  - Erik Loboschefskey, DWR
- **Fishery Agency Strategy Team (FAST)** is a review team composed of technical-level representatives from each fishery agency and Reclamation; the team will work with proponent water agency(ies) to review and assist in planning habitat projects and provide guidance to water agency(ies) on expected benefits of proposed habitat projects in meeting restoration objectives. FAST was consulted on the following dates:
  - February 6, 2013
  - March 27, 2013
  - May 21, 2013
  - September 23, 2013
  - November 21, 2014

- April 1, 2015
- June 23, 2015
- October 28, 2015
- **Expert Panel** is a panel that was convened specifically to analyze the proposed project. It comprised representatives of both the scientific community (i.e., those specifically involved in research and studies related to the Delta ecosystem) as well as those experienced in tidal wetland design and implementation. Professional expertise was represented at the February 18, 2015, meeting in the following disciplines:
  - Suisun Marsh Plan Consistency: Steve Chappell, SRCD
  - Fisheries: Teejay Orear
  - Tidal Marsh Restoration Ecology: Peter Baye
  - Marsh Construction Engineering: Steve Carroll, Ducks Unlimited
  - Foodweb Production: Anke Mueller-Solger
  - Sediment Transport: Brad Hall, Northwest Hydraulics Consultants
  - Long-Term Marsh Sustainability; Larry Wyckoff, CDFW
  - Tidal Marsh Hydrology: Eric Loboschefskey, DWR
  - Terrestrial Marsh Species (SMHM): Lorraine Thompson, Katie Smith, CDFW
  - Suisun Marsh Historic Ecology/Processes: Amber Mardry
  - Monitoring: Romana Swenson, ESA
- **UC Davis Center for Watershed Sciences** is a center that conducts ongoing scientific research and provides extensive scientific knowledge and study of issues facing the bay and delta. Drs. Jim Durand and Peter Moyle of this center were consulted on the design of the proposed project on February 13, 2015. Their recent studies on Luca Pond regarding the effect of residence times in brackish marshes and native fish populations significantly influenced the final breach location and addition of marsh ponds and tidal pannes to the project.
- **Adaptive Management and Monitoring Plan** is the project guiding document that utilizes best available science. This plan is under development by WES, SFCWA, and the cooperating resource agencies and incorporates the best available science and information on land management and monitoring methods. Regular coordination with leadership of the Interagency Ecological Program Tidal Wetlands Monitoring Group is ensuring that the monitoring framework is applicable to the larger studies occurring within the estuary. The plan calls for submittal of annual reports, which will include descriptions and photographs of management and monitoring activities conducted as well as identification of significant ecological and physical process changes that may have occurred. Annual reports will also include summaries and citations regarding recent scientific studies that may inform ongoing management and monitoring of the site. Annual reports will be distributed to FAST and other wildlife and regulatory agencies. Regular site visits with the regulatory and scientific community to view and address habitat and structural issues will occur.

### **DP GP1: Detailed Findings to Establish Consistency with the Delta Plan—Covered Actions Include Applicable Feasible Mitigation Measures Identified in Delta Plan’s Program EIR**

Delta Plan policy GP1 requires that covered actions that are not exempt from CEQA include “applicable feasible mitigation measures identified in the Delta Plan’s Program EIR (unless the measure(s) are within the exclusive jurisdiction of an agency other than the agency that files the certification of consistency), or substitute mitigation measures that the agency that files the certification of consistency finds are equally or more effective” (Delta Stewardship Council 2013). Therefore, a review was done of mitigation measures identified in the Delta Plan’s Program EIR to determine if they are applicable to the proposed project. The review determined that the mitigation measures provided in the Delta Plan are already incorporated into the proposed project (either as environmental commitments or mitigation measures and described under relevant Delta Plan policies below, where applicable) or are not applicable to the proposed project because of the following:

1. They are not specific to the geography of Suisun Marsh. For example, the proposed project is not within a designated mineral resource extraction area; therefore, mitigation measure 13-1, which, in part, calls for future land use changes within designated mineral resource extraction areas to recognize mineral resource extraction as a compatible use, and mitigation measure 13-2, which is related to maintaining access to active mineral resource extraction sites, would not apply (Delta Stewardship Council 2013).
2. They are not specific to restoration projects. For example, Delta Plan mitigation measure 11-7 applies to levee construction projects and projects entailing surface impoundments and fill embankments; Delta Plan mitigation measure 11-8 applies specifically to the construction of on-site wastewater treatment systems (Delta Stewardship Council 2013).
3. Many of the impacts on resources as a result of the proposed project and the SMP EIS/EIR are deemed to be less than significant and thus do not require mitigation (e.g., aesthetics and geology).
4. Site specific SMP environmental commitments and/or mitigation measures are already incorporated into the proposed project for various resources, as applicable (Section 2.6, *Environmental Commitments and Mitigation Measures*, and Appendix B). These measures would be equally effective at avoiding and/or reducing impacts on the resources identified here in Sections 3.3.1–3.3.5 as similar measures identified in the Delta Plan Program EIR.

### **DP P2: Respect Local Land Use When Siting Water or Flood Facilities or Restoring Habitat**

The proposed project would be consistent with Delta Plan policy DP P2. The proposed project does not include the siting of water or flood facilities. The conversion of managed wetlands to tidal wetlands would not be considered an incompatible use with the existing land use designations of the proposed project area or of the adjacent areas in the vicinity (primarily designated by Solano County as “marsh” and “agriculture” [Solano County 2008]). The overall current use of the Suisun Marsh, in general, and of the project area specifically, for recreational activities (hunting, fishing, wildlife viewing, walking, etc.) would not change. In addition, restoration of the proposed project site would not affect water management on the adjacent Grizzly King property because the proposed habitat berm would protect this adjacent property from the expected tidal exchange once the existing natural berm is breached and the project site is fully restored. Finally, the CDFW Grizzly Island Wildlife Area would continue to be managed by CDFW under its current management plan and the proposed project would not affect that management. Under the proposed project the existing drain that allows CDFW to pump discharges

drain water from the managed wetlands of the Grizzly Island Wildlife Area onto the project site would be modified by installation of a spray aeration structure and constructing a pooling area, as described in Chapter 2 of this document. This modification would not impact the Grizzly Island Wildlife area because it would not change the hydrodynamics of the drain (i.e., the drain would continue to drain from the CDFD property onto the project site) and because it would result in higher water quality (lower dissolved oxygen) from the CDFW area onto the project site.

### **ER P2: Restore Habitats at Appropriate Elevations**

The proposed project would be consistent with Delta Plan policy ER P2. The Suisun Marsh is one of six priority habitat restoration areas designated by the Delta Plan (Delta Stewardship Council 2013). The proposed project would not conflict with land elevations identified for “intertidal” in the elevation map of Appendix 4 of the *Draft Conservation Strategy for Restoration of the Sacramento-San Joaquin Delta Ecological Management Zone and the Sacramento and San Joaquin Valley Regions* (Delta Stewardship Council 2013) because the elevation of the proposed project is considered intertidal.

### **ER P3: Protect Opportunities to Restore Habitat**

The proposed project would be consistent with Delta Plan policy ER P3. As discussed under ER P2, The Suisun Marsh is one of six priority habitat restoration areas designated by the Delta Plan (Delta Stewardship Council 2013). The conversion of managed wetlands to tidal wetlands under the proposed project would be consistent with restoring habitat and would support ER P3 in protecting opportunities to restore habitat.

### **ER P5: Avoid Introductions of and Habitat Improvements for Invasive Nonnative Species**

The proposed project would be consistent with ER P5. Currently, there are known invasive species at the project site, including phragmites (*Phragmites australis*), which is controlled on the project site during the summer management period by herbicide application during the flowering period. Much of the phragmites occurs on the natural berm adjacent to Grizzly Bay, and it cannot be removed without undermining the structural integrity of the berm, which would compromise the design and objectives of the proposed project. Although phragmites is an invasive species that is known for capitalizing on disturbance, and the proposed project does include grading and disturbing approximately 150 acres, the proposed project would include multiple environmental commitments as described under Nonnative Plant Control in Appendix B of this document to avoid introducing invasive nonnative species and substantially improving conditions for invasive species, as listed below.

- Use native, noninvasive species or nonpersistent hybrids in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing.
- Use certified, weed-free, imported erosion control materials (or rice straw in upland areas). Coordinate with the county agricultural commissioner and land management agencies to ensure that the appropriate BMPs are implemented.
- Educate construction supervisors and managers on weed identification and the importance of controlling and preventing the spread of noxious weeds.
- Clean equipment at designated wash stations after leaving noxious weed infestation areas
- As feasible, treat isolated infestations of noxious weeds identified in the project area with approved eradication methods at an appropriate time to prevent further formation of seed, and destroy viable plant parts and seed



- Minimize surface disturbance to the greatest extent possible.
- Seed all disturbed areas with native and naturalized seed mixes, as provided in the revegetation plan developed in cooperation with CDFW. Mulch with certified weed-free mulch. Rice straw may be used to mulch upland areas.
- Use native, noninvasive species or nonpersistent hybrids in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing
- Restore or enhance suitable habitat areas that are occupied by, or are near and accessible to, special-status species that have been adversely affected by the permanent removal of occupied habitat areas.

In addition, the proposed project includes an Adaptive Management and Monitoring Plan that incorporates practicable and feasible monitoring and approaches to control non-native invasive species. Finally, the proposed project would restore tidal action to the interior of the project site, which would potentially reduce the ability of invasive species to continue to exist. Furthermore, the restoration would help promote native species suited to a tidal wetland habitat.

## **Recommendations**

### **ER R2: Prioritize and Implement Projects that Restore Delta Habitat**

The proposed project would be consistent with Delta Plan recommendation ER R2. The proposed project occurs within the Suisun Marsh, which is one of the six areas designated by the Delta Plan as priority habitat restoration areas. The proposed project would restore managed wetlands to tidal habitat to support native species, consistent with ER R2.

### **DP R11: Provide New and Protect Existing Recreation Opportunities**

The proposed project is consistent with Delta Plan recommendation R11. The proposed project area currently provides private duck hunting opportunities to duck club members. Under the proposed project, all duck blinds and no longer provide a location within Suisun Marsh for private duck hunting after it is restored. However, over 50,000 acres of managed wetlands would remain within Suisun Marsh available to duck hunting opportunities. During the interim management period (time of breach to approximately five years after breach) the site will be accessible from the bay by boat and could result in passive boating opportunities if boaters so decided. The proposed project site would eventually be turned over to CDFW and it would be managed under this public agencies stewardship. As such, it would be managed by CDFW policies and plans regarding public recreation. Public opportunity for passive recreation (e.g., wildlife viewing) or public duck hunting access may increase on the proposed project site as a result. It is expected that recreation opportunities would be encouraged through those plans and policies as they are consistent with CDFW management of the proposed property.

### **DP R16: Encourage Recreation on Public Lands**

The proposed project is consistent with Delta Plan recommendation R16. As described, in DP R11, once the proposed project is complete it would be managed by CDFW policies and plans regarding public recreation. Public opportunity for passive recreation (e.g., wildlife viewing) or public duck hunting access may increase on the proposed project site as a result. It is expected that recreation opportunities would be encouraged through those plans and policies, as they are consistent with CDFW management of the proposed property.

### 3.3.6 Other Resources

Construction and project site management of the proposed project would either have no impact or a less-than-significant impact on the following resources, as described below (see Table 3-7 for additional details for each resource):

- Aesthetics
- Agricultural resources
- Geology, soils, and mineral resources
- Hazards and hazardous materials
- Noise
- Recreation
- Transportation and navigation
- Utilities and public services
- Population and housing

#### 3.3.6.1 Aesthetics

There are no sensitive view receptors within close proximity of the project area that would be affected by any changes in view during or following construction activities, and no buildings would be built under the proposed project. The demolition of the structures would remove five existing structures that would represent a change to the current visual landscape, but would not affect sensitive viewers as none currently exist on the site. Furthermore, the buildings do not add visual quality to the existing landscape and interrupt views of Grizzly Bay and the surrounding low lying marsh land area. Finally, over time the visual character of the area would be consistent with the surrounding landscape because all disturbed areas would be revegetated, as part of the proposed project's restoration component and environmental commitments (see Table 3-7 and Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*). Therefore, impacts on visual resources are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

#### 3.3.6.2 Agricultural Resources

There are no agricultural lands within the project area and the project area has never been used for agriculture. As such, there would be no impact on agricultural resources due to implementation of the proposed project. No mitigation is required.

#### 3.3.6.3 Geology, Soils, and Mineral Resources

During construction of the habitat berm, the area may be subject to ground shaking and increased ground pressures from heavy equipment or placement of fill. This additional loading may exceed the potential for the existing levee material or levee foundation material to support the levee section (i.e., shear strength) and may cause rapid settling or fracture of the levee section. However, construction equipment access and placement of fill would be controlled to maintain acceptable loading based on the shear strength of the foundation material, as part the proposed project's environmental commitments.

The proposed project would not involve the construction or operation of buildings and would not bring substantial amounts of people to Suisun Marsh; therefore, neither people nor structures would be exposed to potential substantial adverse effects, including the risk of loss, injury, or death associated with geologic activities.

Project activities are not expected to create unstable cut or fill slopes, and would likely benefit slopes in the newly created tidal wetlands (Hultgren-Tillis Engineers 2015). Ground-disturbing activities, such as earthwork during Phase 1 and the demolition of the existing structures in Phase 2, could result in the loss of topsoil and erosion. Breaching of the levee would result in scour and localized sediment deposition but would reflect the restoration of natural tidal processes interrupted by the existing natural berm. As such, the proposed project implements of a Stormwater Pollution Prevention Plan (SWPPP) and an Erosion and Sediment Control Plan (see Table 3-7 and Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*).

There are no underground or aboveground natural gas lines, petroleum lines or known mineral resources within the project area.

Given that the proposed project would not substantially affect geologic or mineral resources, or soils and that project design and environmental commitments would be implemented to ensure this, impacts are within the scope of the impacts identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

#### 3.3.6.4 Hazards and Hazardous Materials

Proposed project activities would not create significant hazards to the public or environment through exposure to hazardous materials because the proposed project does not involve the handling, transportation, or distribution of large quantities of hazardous materials. The project area has never been used for agriculture and has only experienced periodic spraying of phragmites in discrete areas of the project area, as approved by existing permits. Furthermore, a site reconnaissance and records review did not identify physical evidence of soil or groundwater impairments and no known documentation of potential impairments (Erikson pers. comm.). Given the site characteristics and the results of the records review and site reconnaissance, there is a low probability of soil and groundwater contamination. Environmental commitments would be implemented to reduce hazards to the public or environment during construction Phases 1 and 2, including the demolition of the existing structures, including a Hazardous Materials Management Plan and standard design features and construction practices (see Table 3-7 and Appendix B, *Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures*). Further, because restoration of the project area would not significantly change wildlife or bird usage of the area, and because the project area is over five miles from the nearest airport that bird activity would not affect air traffic, there would be no effect on air traffic safety. Also, given the location of the proposed project area, there would be no potential to expose people or structures to wildland fires, or to impede emergency access. Therefore, impacts related to hazards and hazardous materials are within the scope of the impacts identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

#### 3.3.6.5 Noise

Although there would be increased noise in the proposed project area and immediately adjacent areas due to construction activities associated with restoration of the site, because there are no residences or sensitive receptors nearby, people would not be exposed to excessive noise or

groundborne vibrations. Accordingly, potential noise impacts are within the scope of the impacts that were identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### 3.3.6.6 Recreation

There are no recreational activities or recreational facilities associated with the proposed project; therefore, there would be no adverse physical effect on the environment associated with increased recreation because of project implementation. Although private duck hunting opportunities would no longer exist in the project area following project implementation, ample hunting opportunities exist within the greater Suisun Marsh area. Public opportunity for passive recreation (e.g., wildlife viewing) may increase as a result of the tidal restoration. Therefore, potential impacts on recreation are within the scope of the impacts identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### 3.3.6.7 Transportation and Navigation

Given the nature of the proposed project (limited truck trips and a limited duration of less than 80 days), it would not conflict with any applicable plan, ordinance or policy related to the performance effectiveness or level of service of land transportation. The proposed project would not increase road hazards because activities would occur away from existing major road networks, and would not interfere with air traffic. Additionally, although the proposed project would require the transport of construction equipment, it would not require the import or export of fill materials and therefore damage to roadway surfaces is expected to be limited. Although there would be limited work on the exterior natural berm adjacent to Grizzly Bay, the work would be limited in magnitude and duration such that it would not be a navigation hazard (e.g., less than one month). Therefore, potential impacts on transportation and navigation are within the scope of the impacts identified in the SMP EIS/EIR and remain less than significant. No mitigation is required.

### 3.3.6.8 Utilities and Public Services

There are no underground or aboveground natural gas lines, petroleum lines, or overhead power lines on the project site, and therefore, implementation of the proposed project would not damage or disrupt these utilities (First American Title Insurance Company [unknown date]). As such, the mitigation measures identified in the SMP EIS/EIR are not applicable to the proposed project (Table 3-7). Similarly, the proposed project would not require the construction of new water, wastewater, or stormwater drainage facilities; the use of wastewater facilities; a water supply; or landfills and, therefore, would not affect these public services. In addition, although project-associated construction vehicles would be traveling on local roadways, they would be limited in number, for a limited duration (less than 80 days), and thus would not be expected to affect emergency services. Lastly, the proposed project does not involve or require construction or expansion of government facilities and would not affect schools, parks, or other community services. Therefore, potential impacts on utilities and public services are within the scope of the impacts identified in the SMP EIS/EIR and would either have no impact or remain less than significant. No mitigation is required.

### 3.3.6.9 Population and Housing

Because it is a tidal wetlands restoration project, the proposed project would not result in direct or indirect population growth, displacement of existing housing, construction of new housing, or the displacement of people such that construction of replacement housing would be necessary. Therefore, there would be no impact on population and housing. No mitigation is required.

## 3.3.7 Cumulative Impacts

The State CEQA Guidelines require the cumulative impacts of a proposed project to be addressed when the cumulative impacts are expected to be significant and, under CEQA, when the project's incremental effect is cumulatively considerable (State CEQA Guidelines Section 15130[a], 40 Code of Federal Regulations [CFR] Section 1508.25[a][2]). Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (State CEQA Guidelines Section 15355[b], 40 CFR Section 1508.7). Section 15130 of the State CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable.

### 3.3.7.1 SMP EIS/EIR

The SMP EIS/EIR generated a project list to evaluate cumulative impacts. That list included:

- Other tidal restoration projects in the San Francisco Bay Area that could result in impacts and benefits similar to those of the SMP.
- Related projects, including CALFED, BDCP/California Water Fix, Delta Vision, DRERIP, SF Bay LTMS, DRMS, SF Bay Ecosystems Goals, the Delta Plan, and the various USFWS Recovery Plans for species that use Suisun Marsh;
- City and county development projects (e.g., new or expanded residential, commercial, or industrial development projects); and
- Regional and local agency infrastructure projects (e.g., water and wastewater facility construction and/or improvements and flood protection projects).

In addition, regional plans were reviewed to characterize development trends and growth projections in Solano County over the 30-year implementation period. These projects are considered with the SMP to determine whether the combined effects of all of the projects would be cumulatively considerable and, therefore, result in significant cumulative impacts.

The SMP EIS/EIR determined that, for all resources, except cultural resources, cumulative impacts would either not occur or the SMP incremental contribution to the cumulative impact would not be cumulatively considerable and significant. This is generally because:

- SMP restoration activities would be restricted to areas within the marsh; many of the other projects that could result in a cumulatively considerable impacts to resources such as air quality, biological resources, cultural, noise, traffic, water quality, and utilities would occur well outside the marsh
- SMP restoration activities would occur at on a different temporal and geographic scale than some of the restoration and development/infrastructure projects

- SMP restoration modeled scenarios contribution to changes in water quality (i.e., salinity) were not considerable and restoration would be subject to the various regulations in place to control salinity in the marsh and throughout the Delta
- SMP restoration activities would include design criteria and environmental commitments to reduce substantial changes related to water supply, water quality, terrestrial and aquatic biological resources, sediment and geology, and transportation and navigation
- SMP restoration activities would be small, sporadic, and short term in nature and magnitude over the entire marsh and through plan implementation
- SMP restoration activities would result in an increase in quality and quantity for sensitive terrestrial and aquatic biological resources
- SMP restoration activities would implement, as appropriate, mitigation measures related to air quality, cultural resources, and utilities and public services as described in the SMP EIS/EIR
- SMP restoration activities would not result in impacts on some resource, such as aesthetics, recreation, flood control and levee stability, noise, and land use

The SMP EIS/EIR determined that, for cultural resources, restoration activities would be cumulatively considerable and significant because significant impacts on numerous cultural resources, including the Montezuma Hills Rural Historic Landscape, would occur. Impacts on the Montezuma Hills Rural Historic Landscape resource are especially consequential, as several constituent features—some of which are likely to have individual significance—would be affected by restoration activities described in the SMP.

### 3.3.7.2 Proposed Project

Table 3-6a provides a list of wetland restoration and enhancement projects (status and projects updated since the time of certification of the SMP EIS/EIR). Several tidal restoration projects have been completed, are under way, or are proposed throughout the San Francisco Bay Area. Each of these restoration projects is expected to increase natural habitats for species that historically have occupied these areas. Because they all require a shift in habitat types, these projects all have some level of habitat loss associated with conversion. Additionally, managed wetland activities have been proposed through the North American Waterfowl Conservation Act and the San Francisco Bay Joint Venture. Associated activities are expected to improve management capabilities and habitat functions and values. Other major projects that could have a restoration component to them are also included in this table, such as the BDCP/California WaterFix or the Delta Plan. Table 3-6b provides a list of other projects identified in the SMP EIS/EIR that could result in cumulative impacts.

As disclosed in the SMP EIS/EIR, the projects identified in Tables 3-6a and 3-6b have the potential to result in cumulatively considerable impacts on the following resources, depending on project specific considerations, project design, and geographic conditions:

- Biological Resources – Fish
- Biological Resources – Vegetation and Wetlands
- Biological Resources – Wildlife
- Water quality
- Geology and groundwater
- Sediment transport

- Transportation and navigation
- Air Quality
- Noise
- Utilities and Public Services
- Cultural Resources

**Table 3-6a. Updated Wetland Restoration and Enhancement Cumulative Project List**

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
12 <sup>th</sup> Street Reconstruction Project	Planned	Alameda	0.7	Completed, 2013
Adobe Creek Upper Reach 5 Restoration Project	Planned	Santa Clara	0.8	Completed, 2009
Albany Bulb Lagoon	Planned	Alameda	6.7	Planned*
Albany Salt Marsh Expansion	Planned	Alameda	3.6	In progress**
American Canyon Creek Restoration	Planned	Napa	1.1	Planned*
American Canyon Ecosystem Enhancement Project	Completed	Napa	610.0	N/A
Bahia Lagoon	Completed	Marin	30.1	N/A
Bailey Estates	Planned	Contra Costa	5.7	Planned*
Bair Island Restoration Project	In progress	San Mateo	1,385.5	In progress (as of December 2015)
Bair Island SFO Mitigation	Completed	San Mateo	220.2	N/A
Barron Creek at 1018 Los Robles Avenue	Planned	Santa Clara	< 0.1	Planned*
Bayside Business Park—December 2002	In progress	Alameda	17.0	Completed
Bayside Business Park—Phase I	Completed	Alameda	271.0	N/A
Bayside Business Park—Phase II	Completed	Alameda	88.0	N/A
BDCP/California WaterFix	Planned	Primarily Alameda, Contra Costa, Sacramento, San Joaquin, Solano, Sutter, and Yolo Counties	Depends on the alternative selected but could include at least 15,000 acres of restored habitat, some of which would be tidal habitat	Planned
Bel Marin Keys Unit V	In progress	Marin	1,564.4	Estimated completion, 2015
Belden's Landing	Completed	Solano	15.2	N/A
Blacklock Tidal Marsh Restoration	Completed	Solano	70.0	N/A
Bothin Marsh	Completed	Marin	0.5	N/A



Project	SMP EIS/EIR Status	County	Total Acres	Current Status
Breuners Mitigation Bank	Planned	Contra Costa	109.1	Completed, 2014
Brisbane Baylands	In progress	San Mateo, San Francisco	32.0	In progress
Burlingame Lagoon	Completed	San Mateo	0.3	N/A
Caltrans Mitigation Site	Completed	Solano	21.6	N/A
Camp 2 Wingo Unit Marsh Restoration	In progress	Napa, Sonoma	608.0	In progress*
Can Duck Club	Planned	Napa	Unknown	Planned*
Canalways	Planned	Marin	85	Planned**
Cargill Mitigation Marsh	Completed	Alameda, San Mateo	49.2	Planned *
Carquinez Bridge Seismic Retrofit Project	In progress	Solano	0.7	Completed, 2003
Carriger Creek Enhancement	Planned	Sonoma	1.0	Planned**
Castro Cove	In progress	Contra Costa	20.0	In progress
Castro Valley Creek Daylighting Project	Planned	Alameda	0.8	Completed, 2010
Central Avenue Marsh	Completed	Contra Costa	2.9	N/A
Central Avenue Marsh—Albany Sequel	Completed	Contra Costa, Alameda	Unknown	N/A
Cerrito Creek at Albany Hills	Completed	Alameda	1.1	N/A
Charleston Slough Tidal Marsh Restoration Project	Completed	Santa Clara	101.3	N/A
Chipps Island East***	Completed	Solano	270.0	N/A
Chipps Island West***	Completed	Solano	148.0	N/A
Citation Marsh	Completed	Alameda	95.4	N/A
City of Calistoga Bank Stabilization	Planned	Napa	0.1	Planned**
Codornices Creek Restoration—Nagai Property	Planned	Alameda	< 0.1	Estimated completion, 2007
Cogswell Marsh	Completed	Alameda	229.1	N/A
Colma Creek Mitigation	Completed	San Francisco, San Mateo	1.6	N/A
Color Spot	Completed	Contra Costa	1.5	N/A
Cooley Landing	Completed	San Mateo	118.4	N/A
Corte Madera Ecological Reserve Expansion	Completed	Marin	8.3	N/A
Coyote Creek Flood Control Project	Completed	Santa Clara	66.6	N/A

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
Coyote Creek Lagoon	Completed	Alameda	8.0	N/A
Crissy Field	Completed	San Francisco	13.5	N/A
Cullinan Ranch	Planned	Solano, Napa	1,564.1	In progress
Damon Slough Seasonal Wetland Mitigation	Completed	Alameda	9.8	N/A
Dan Wilson Creek Bridge Project	Planned	Solano	1.1	Completed, 2010
Deak Marsh	Completed	Marin	0.6	N/A
Deer Valley Wetland Restoration	Planned	Santa Clara	2.2	Planned*
Delta Plan	In progress	Primarily Alameda, Contra Costa, Sacramento, San Joaquin, Solano, Sutter, and Yolo Counties	U/K	Completed
Downtown Sewer, Water, and Storm Drain Improvements	Planned	Contra Costa	Unknown	Planned*
Dutch Slough Tidal Marsh Restoration Project	Not Included	Contra Costa	1,200	Planned
Dunphy Park	Completed	Marin	0.8	N/A
DUST Marsh	Completed	Alameda	15.0	N/A
East San Rafael Wetlands	Completed	Marin	13.0	N/A
East Shore Park—Berkeley Meadows	Planned	Alameda	55.2	Completed, 2005
East Shore Park—Schoolhouse Creek	Planned	Alameda	2.3	Planned*
East Shore Park—Strawberry Creek	Planned	Alameda	1.7	In progress
Eden Ecological Preserve Restoration Project	Planned	Alameda	767.6	Completed, 2015
Eden Ecological Preserve Restoration Project—Dixon Landing Road Project	In progress	Alameda, Santa Clara	17.5	Completed, 2015
Edgerley Island Marina	Completed	Napa	9.4	N/A
Elsie Gridley Mitigation Bank—North Suisun Mitigation Bank	Planned	Solano	1.4	Completed, 2007
Elsie Roemer Enhancement Project	Planned	Alameda	0.6	Estimated completion, 2007
Emeryville Crescent	Completed	Alameda	50.3	N/A
Emily Renzel Marsh	Completed	Santa Clara	36.0	N/A

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
Faber Tract Marsh	Completed	San Mateo	87.3	N/A
Fairfield Corporate Commons Project	Planned	Solano	2.3	Planned*
Figueras Tract	Planned	Solano	72.7	Planned*
Foster City Mitigation Sites	In progress	San Mateo	29.2	In progress*
Galbraith Golf Course Wetland Mitigation Project	Completed	Alameda	8.0	N/A
Gallinas Creek Restoration Project (Phases 1, 2, and 3)	Completed	Marin	19.5	N/A
Gasser, Vernice/FHK Investment—Gasser Estate Wetland Mitigation	Planned	Napa	1.0	Planned*
Ghisletta Project Site	Planned	Napa	1.6	Estimated completion, 2009
Gianulus Property	Completed	Solano	2.1	N/A
Green Point/Toy Marsh	Completed	Marin	57.4	N/A
Guadalcanal Village Restoration Project	Completed	Solano	55.5	N/A
Hamilton Wetlands Restoration Project	In progress	Marin	1,451.2	Estimated completion, 2015
Harvey Marsh	Completed	Santa Clara	52.0	N/A
Hayward Marsh Brackish	Completed	Alameda	60.0	N/A
Hayward Marsh Fresh	Completed	Alameda	85.9	N/A
Hayward Shoreline Enhancement Project	Completed	Alameda	80.3	N/A
Hayward Shoreline Enhancement Project-Oliver Salt Ponds	Planned	Alameda	134.0	Planned*
Hill Slough West Restoration Project	Planned	Solano	223.0	In progress
Hoffman Marsh Wetland Mitigation Project	Completed	Contra Costa	6.0	N/A
Honker Bay Conservation Bank	Not Included	Solano	125	Planned
Huichica Creek Enhancement	Completed	Napa, Sonoma	105.5	N/A
Huichica Creek Unit	In progress	Sonoma	51.0	Completed
I-80 Improvements/HOV Land Project	Completed	Alameda	2.8	N/A
Ideal Marsh	Completed	Alameda	129.4	N/A
Inverness Ridge	Planned	Alameda	0.7	Planned*
Island Slough Unit	Completed	Solano	354.0	N/A
John F. Kennedy Park Wetland Enhancement Project	Planned	Napa	17.0	Planned*

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
Kennedy Park Master Plan	Planned	Napa	0.1	In progress
KGO Towers	Completed	Alameda	1.3	N/A
Kingdom Hall of Jehovah's Witnesses	Planned	Napa	0.2	Planned*
Knapp Tract	Planned	Santa Clara	381.8	In progress
La Riviere Marsh	Completed	Alameda	117.6	N/A
Lake Merritt Restoration	Planned	Alameda	153.3	In progress
Lakeside Drive and Mariner's Island Extension Mitigation	Completed	San Mateo	1.9	N/A
Las Gallinas Ponds	Planned	Marin	68.4	Completed
Leonard Ranch Wetlands Restoration Project	Completed	Sonoma	334.8	N/A
Lower Walnut Creek Emergency Interim Protection	Planned	Contra Costa	8.2	Completed, 2007 and 2012
Lower Yolo Ranch Tidal Restoration Project	Not Included	Yolo	1,100	Planned
Madera Bay Park	Completed	Marin	4.9	N/A
Madera del Presidio Project (Phases I and II)	Completed	Marin	100.0	N/A
Mallard Farms Conservation Bank	Not Included	Contra Costa/Solano?	700	In Progress
Mare Island Navy Conservation Areas	Planned	Solano	106.3	Planned*
Mare Island Navy Mitigation Marsh	Planned	Solano	62.7	Planned*
Mare Island Refuge	Planned	Solano	169.9	Planned*
Marin Flood Control—Seasonal	Completed	Marin	343.4	N/A
Marin Flood Control/CDFW—Perennial	Completed	Marin	309.2	N/A
Marta's Marsh	Completed	Marin	20.7	N/A
Martinez Regional Shoreline Salt Marsh Enhancement Project	Completed	Contra Costa	11.0	N/A
Mayhew's Landing	Planned	Alameda	110.4	Completed, 2013
McGarvey Gulch Salmonid Barrier Improvements Project	Planned	San Mateo	0.6	Planned*
Mill Valley Marsh	Completed	Marin	6.5	N/A
Miller Creek	Completed	Marin	12.0	N/A
MLK Jr. Regional Shoreline Wetlands Project	Completed	Alameda	70.6	N/A
Montezuma Wetlands Project	In progress	Solano	2,229.0	Completed

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
Moseley Tract	Planned	San Mateo	61.0	Planned*
Mountain View Tidal Marsh	Completed	Santa Clara	28.9	N/A
Muzzi Marsh	Completed	Marin	147.9	N/A
Napa Air Center Wetland Preserve	Planned	Napa	0.6	Planned*
Napa Meadows Development	Planned	Napa	9.9	Planned*
Napa River Bank Stabilization—Carpy-Connolly Ranch	Planned	Napa	0.7	Planned*
Napa River Flood Control	Planned	Napa	940.1	In progress
Napa River Oxbow Preserve	Planned	Napa	37.3	Completed, 2009
Napa River, Gasser Wetland Relocation	Planned	Napa	9.5	Planned*
Napa Sonoma Marsh Restoration Project	In progress	Napa, Sonoma	7,322.4	Completed
Napa Urban Waterfront Restoration	Planned	Napa	Unknown	Planned*
Napa Valley Gateway Business Park and Sheehy Creek Realignment and Enhancement Project	Planned	Napa	5.4	Planned*
Napa Valley Unified School District Site	Planned	Napa	314.1	Planned*
Nevada Parcel	Completed	Contra Costa	109.0	N/A
New Chicago Marsh	Completed	Santa Clara	387.0	N/A
Nordstrom/Shorebird Marsh	Completed	Marin	48.2	N/A
North Basin Wetlands	Completed	Alameda	5.0	N/A
North Bothin Marsh Enhancement Project	Completed	Marin	0.4	N/A
Northern Outer Bair Island	Completed	San Mateo	551.7	N/A
Novato Creek Antenna Field	Planned	Marin	134.2	Planned*
Novato Flood Control Project Mitigation	Completed	Marin	8.0	N/A
Novato Sanitary District Reclamation Project	Completed	Marin	65.0	N/A
Oakland Middle Harbor Enhancement Project	In progress	Alameda	4.9	In progress
Oro Loma Marsh Enhancement Project	In progress	Alameda	315.3	In progress*
Oro Loma Marsh Mitigation Project	Completed	Alameda	21.0	N/A
Pacheco Pond	Completed	Marin	110.9	N/A
Pacific Commons Development	Completed	Alameda	492.0	N/A
Pacific Shores Center	Completed	San Mateo	146.2	N/A
Palmaz Vineyards Creek Restoration	Planned	Napa	Unknown	Complete, 2010

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
Palo Alto Harbor Improvements	Completed	Santa Clara	14.3	N/A
Perry Gun Club Mitigation Project	In progress	Alameda	16.8	In progress*
Petaluma Marsh Expansion Project	In progress	Marin	108.3	Completed, 2005/2006
Petaluma River Marsh	Completed	Sonoma	45.8	N/A
Pier 94	In progress	San Francisco	7.7	Completed, 2006
Pier 98	Completed	San Francisco	8.8	N/A
Pioneer Bank Stabilization Project	Planned	Napa	0.1	Completed, 2013/2014
Plummer Creek Wetlands Restoration Mitigation Project	Completed	Alameda	26.0	N/A
Point Buckler***	Completed	Solano	49.5	N/A
Polhemus Creek Restoration Project	Planned	San Mateo	0.2	Planned*
Pond 3	Completed	Alameda	110.2	N/A
Pond A18	Planned	Santa Clara	855.6	Complete, 2005/2008
Pond A4	Planned	Santa Clara	306.4	Planned*
Port Sonoma Marina Perimeter	Completed	Sonoma	8.9	N/A
Prospect Island Tidal Restoration Project	Not Included	Solano	1,600	Planned
Ravenswood Triangle	Completed	San Mateo	3.0	N/A
Reconstruction of Bollinger Road Bridge over Calabazas Creek	Planned	Santa Clara	0.2	Complete, 2009
Redwood-San Andreas High School Marsh	Completed	Marin	15.0	N/A
Refugio Creek Bridge Project	Planned	Contra Costa	0.2	Planned*
Richardson Bay Bridge Marshes	Completed	Marin	6.6	N/A
Richmond Parkway	Completed	Contra Costa	3.3	N/A
Ringstorm Bay Unit Marsh Restoration	In progress	Napa	50.0	Completed, 2004
River Park	Planned	Solano	38.8	Planned*
Route 101/Ralston Ave. Interchange	In progress	San Mateo	1.9	Completed
Rush Creek/Cemetery Marsh Enhancement Project	Completed	Marin	272.1	N/A
Ryer Island***	Completed	Solano	929.2	N/A

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
San Carlos Airport North Clear Zone	Completed	San Mateo	0.6	N/A
San Leandro Shoreline Marshlands Enhancement Project	Completed	Alameda	171.9	N/A
San Mateo's Master Shoreline Parks Master Plan	In progress	San Mateo	13.1	Completed
Sanchez Creek Marsh	Completed	San Mateo	3.1	N/A
Schellville	Planned	Sonoma	386.7	Planned*
Scottsdale Marsh Enhancement Project	Completed	Marin	46.4	N/A
Seabreeze Marina	In progress	Alameda	0.3	In progress*
Seal Slough	Completed	San Mateo	47.2	N/A
Shell Marsh Restoration Project at Peyton Slough	In progress	Contra Costa	200.0	In progress*
Simmons Slough Wildlife Corridor	Planned	Marin	186.2	Completed
Skaggs Island	Planned	Sonoma	4,166.8	Planned
Sky Ranch Stock Pond Rehabilitation	Planned	Contra Costa	0.2	Completed, 2006
Slaughterhouse Point	Completed	Solano	275.5	N/A
Sonoma Baylands Salt Marsh Restoration	Completed	Sonoma	350.0	N/A
South Basin Wetlands	Completed	Alameda	3.7	N/A
South Bay Salt Pond Restoration Project	In progress	Alameda, San Mateo, Santa Clara	13,681.9	In progress
St. Helena Comprehensive Flood Protection Project	Planned	Napa	7.8	Completed, 2011
Stevens Creek Tidal Marsh	Completed	Santa Clara	30.6	N/A
Sulphur Creek Restoration Project	Planned	Napa	0.8	In progress
Sunnyvale Baylands Park	Completed	Santa Clara	12.4	N/A
Tasman Corridor Light Rail Transit Mitigation Project	In progress	Santa Clara	3.6	Completed, 2009
Tolay Creek	Completed	Sonoma	305.5	N/A
Trancas Road—State 29 Interchange	Planned	Napa	0.2	Estimated Completion, 2004
Treasure Island	Planned	San Francisco	16.7	In progress
Triangle Marsh at Hayward Shoreline	Completed	Alameda	8.7	N/A
Triangle Marsh at Larkspur	In progress	Marin	1.0	In progress*
Triangle Marsh Restoration Project	Completed	Marin	15.9	N/A

Project	SMP EIS/EIR Status	County	Total Acres	Current Status
Triangle Marsh, Refuge Entry	In progress	Alameda	9.4	In progress*
Tubbs Island Marsh Restoration Project	Completed	Sonoma	68.4	N/A
U.S. Maritime Administration Marsh	Completed	Solano	69.6	N/A
Upper York Creek Dam Sediment Removal Project	Planned	Napa	2.0	In progress
Vallejo Mitigation Sites	Completed	Solano	137.4	N/A
Viansa Winery	Completed	Sonoma	94.3	N/A
Warm Springs Pasture	Planned	Alameda	276.0	Planned*
Webb Ranch Mitigation Site	Planned	San Mateo	1.8	Estimated completion, 2007
West End Duck Club	Completed	Napa, Solano	355.2	N/A
West Navy Marsh	Completed	Contra Costa	64.4	N/A
Western Stege Marsh Restoration	In progress	Contra Costa	9.4	Completed, 2004
Whales Tail	Completed	Alameda	254.0	N/A
Wheeler Island	Completed	Solano	98.0	N/A
Whipple Ave Mitigation	Completed	San Mateo	7.7	N/A
White Slough	Completed	Solano	94.1	N/A
Wildcat Creek Marsh Restoration Project	Completed	Contra Costa	279.7	N/A
Zanker Road Landfill Mitigation Site	Completed	Santa Clara	25.0	N/A
Zone 12 Lines H, J, and K Sediment Removal Project	Planned	Alameda	3.2	In progress

\* Status from SMP EIS/EIR was used.

\*\* Projects identified on the San Francisco Bay Joint Venture Active Project List.

\*\*\* These properties were restored as a result of unrepaired levee failures, not as restoration projects.



**Table 3-6b. Updated Other Projects Cumulative Project List**

Project	SMP EIS/EIR Status	Location	Total Acres	Current Status
CVP/SWP Coordinated Operations Biological Opinions	In progress	Primarily Solano and Sacramento	8,000 acres in Suisun Marsh and the north Delta	In progress
Sacramento Deep Water Ship Channel Dredging	Planned	Sacramento	—	In progress
Potrero Hills Landfill Expansion Project	Planned	Solano	250	In progress
Industrial Development (south of SR 12 and north of Cordelia Road)	Planned	Solano	—	In progress
Collinsville-Montezuma Wind Resource Area	Planned	Solano	—	In progress
Montezuma Wind Project and PG&E Reconductoring Project	Planned	Solano	—	Completed
Kirby Hills Natural Gas Storage Facility	Planned	Solano	—	Completed, 2009
Bay Area Regional Rail Plan	In progress	Multiple	—	Completed, 2007

As demonstrated in the analysis in Sections 3.3.1 through Section 3.3.6 and contained in Table 3-7, the proposed project would not result in impacts not previously disclosed in the SMP EIS/EIR. In addition, the proposed project would not result in any significant and unavoidable impacts on resources not previously disclosed in the SMP EIS/EIR and would not result in new significant and unavoidable impacts on resources. Furthermore, impacts on cultural resources and utilities and public services would be less than significant under the proposed project because of the baseline conditions and the location of the proposed project and, thus, would be reduced when compared to the impact determination disclosed for those resource in the SMP EIS/EIR (i.e., significant and unavoidable or less than significant with mitigation incorporated).

In November 2015, CCWD requested a quantitative cumulative salinity analysis by expanding the model analysis of the proposed project (Appendix D.1) to one that contained several foreseeable habitat restoration projects. RMA modified the model to include the following projects, which are in concept and planning phases: Dutch Slough (1,178 acres modeled), Prospect Island (1,600 acres modeled), Lower Yolo Restoration Project (1,787 acres modeled), Mallard Farms Conservation Bank (650 acres modeled), Honker Bay Conservation Bank (112 acres modeled), and McCormack-Williamson Tract (1,600 acres modeled). None of these projects are as close to implementation as the proposed project. The addition of several thousand acres of tidal prism to the model geometry, especially the addition of McCormack-Williamson Tract located in the eastern Delta, resulted in increases in salinity at the Delta pumps well beyond what was modeled for the proposed project alone<sup>8</sup>. Several proposed tidal restoration projects within the Suisun Marsh, which may dampen the modeled salinity increases in the Delta, were not included in the model run. Furthermore, there is uncertainty regarding which Delta tidal restoration projects would be fully implemented. As such, the salinity effects of the proposed project do not exceed those described in the SMP EIS/EIR, and the incremental contribution of the proposed project is not cumulatively considerable or significant.

The proposed project does not include activities that would contradict the cumulative impact analysis and conclusions in the SMP EIS/EIR. Thus, the proposed project:

- Would be restricted to areas within the marsh; many of the other projects that could result in potentially cumulatively considerable impacts related to resources such as noise, traffic, utilities and public services, and cultural resources would occur outside the marsh
- Would occur at on a different temporal and geographic scale than some of the restoration and development/infrastructure projects listed in Tables 3-6a and 3-6b
- Includes design criteria and environmental commitments to reduce substantial changes related to water supply, water quality, fish and wildlife species, vegetation and wetlands, and sediment and geology
- Would be relatively small, sporadic, and short term in nature and magnitude during construction over the entire marsh and, thus, have very limited, localized, or temporary effects related to water quality, fish and wildlife species, vegetation and wetlands, sediment and geology, and hazards and hazardous materials during construction
- Would result in an increase in quality and quantity related to sensitive fish and wildlife species and vegetation

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<sup>8</sup> The RMA report is available at SFCWA website: <http://www.sfcwa.org/2013/03/27/tule-red-restoration-project/>

- Would not need to implement mitigation measures related cultural resources or utilities and public services
- Would not need to implement new mitigation measures related to air quality
- Would not result in impacts on aesthetics, recreation, flood control and levee stability, noise, or land use

Although past, present, and reasonably foreseeable future projects may result in cumulatively considerable impacts on certain resources, it is anticipated that the proposed project would not result in a cumulatively considerable contribution, and impacts would be less than significant.

## 3.4 Impact Checklist

Table 3-7 provides an impact-by-impact discussion of each resource. It includes a discussion of the Appendix G thresholds of the State CEQA Guidelines, the SMP EIS/EIR thresholds and impact determinations, and the Tule Red impact determinations.

The following are important to note with respect to this table:

- The table notes where environmental commitments, BMPs, or mitigation measures differ between the Tule Red project and the information described in Appendix F, *Mitigation Monitoring and Reporting Program*, and Chapter 2, *Habitat Management, Preservation, and Restoration Plan*, of the SMP EIS/EIR. In other words, the Tule Red project incorporates all environmental commitments, BMPs, and mitigation measures described in Appendix F and Chapter 2 of the SMP EIS/EIR unless otherwise described.
- The first resources identified in the table are those resources identified in the initial study checklist of Appendix G of the State CEQA Guidelines. Resources in parenthesis indicate resources evaluated in the SMP EIS/EIR.
- Environmental commitments identified in the SMP EIS/EIR (2011) impact analysis are bolded.
- “No Information Incorporated”: This means the SMP EIS/EIR impact analysis did not refer to specific environmental commitments or specific assumptions related to restoration.
- If specific SMP restoration activities in the impact analysis are not noted, assume the following (from SMP EIS/EIR Chapter 2):
  - Site preparation
    - Grade and prepare to re-create flows and hydraulic conditions
    - Fill ditches in with dirt, brush boxes, or other material
    - May include digging starter channels
    - Establish vegetation communities prior to inundation
    - Moist soil management
    - Maintenance of levees and water control structures
  - Upgrading or constructing new exterior levees

- Existing interior levees may be upgraded with brush boxes or other biotech wave dissipaters, or new exterior levees may be constructed
- Construct habitat levees, depending on cost and availability of fill, by widening existing interior levees or constructing new interior levees or islands
- Habitat levees would be constructed from available resources and may include channel dredged material as well as excavated material
- Breaching levees
  - Breach edges may require scour protection with rock, geotextiles, or piles, or long reaches of levee may be graded down to lower elevations
  - Breach location, number, and size chosen to maximize ecological benefits and minimize upstream tidal muting, tidal elevation changes, slough channel scour, and hydraulic changes
- Mitigation measures identified in the SMP EIS/EIR (2011) impact analysis are underlined

Table 3-7. Impact Checklist

CEQA Guidelines Appendix G Impact	SMP EIS/EIR Impact	SMP EIS/EIR: Significance before Mitigation	SMP EIS/EIR: Mitigation Measures (MMs)	SMP EIS/EIR: Significance after MMs	SMP EIS/EIR Description of Restoration Activities Evaluated	SMP EIS/EIR Impact Analysis Summary	SMP Assumptions or Environmental Commitments (ECs) Identified in Impact Analysis or Chapter 2 of the SMP EIS/EIR	Tule Red Project <sup>1</sup>
<b>AESTHETICS (VISUAL/AESTHETIC RESOURCES)<sup>2</sup></b>								
a.) Have a substantial adverse effect on a scenic vista. c.) Substantially degrade the existing visual character or quality of the site and its surroundings.	VIS-1: Temporary Changes in Views Caused by Construction Activities	LS	None required	—	<ul style="list-style-type: none"> <li>• Breaching and lowering exterior levees</li> <li>• Upgrading or creating new interior levees</li> <li>• Creating habitat levees</li> <li>• Increasing connectivity between marsh plain and waters</li> <li>• Redirecting intakes, discharges, and outfalls</li> </ul>	Construction activities would introduce heavy equipment and associated vehicles into the viewshed; evening and nighttime construction activities would require the use of bright lights, which would affect nighttime views.	<b>Environmental Commitment: Visual/Aesthetic Best Management practices, specifically: Identify sensitive view receptors for site-specific analysis and ensure that contractors minimize fugitive light from portable sources used for nighttime operations. Also, a visual barrier will be installed to prevent light spill from truck headlights in areas with sensitive view receptors.<sup>3</sup></b>	There are no sensitive view receptors in proximity to the Tule Red project site that would experience a substantial change in view caused by construction activities or would be affected by fugitive light from portable light sources. Furthermore, it is not expected that construction would require significant sources of portable light given it will primarily be performed during daylight hours (e.g., sunup to sundown). Construction activities would occur over a short duration (90 days). The demolition of the structures would remove five existing structures that would represent a change to the current visual landscape, but would not affect sensitive viewers as none currently exist on the site. Furthermore, the buildings do not add visual quality to the existing landscape and interrupt views of Grizzly Bay and the surrounding low lying marsh land area. Therefore, the EC identified in the SMP EIS/EIR is not applicable to the proposed project. Impacts would be less than significant.
	VIS-2: Temporary Changes in Views Caused by Habitat Reestablishment Period	LS	None required	—	Habitat reestablishment during transitional state and over a period of a couple of years prior to maturation of vegetation and recolonization.	The restored tidal areas may be temporarily denuded of vegetation, or appear so from a distance because of immature planted vegetation, and look more like a mud flat or open water where mature vegetative communities once existed. Because the sites would be scattered in different locations, a visual imposition on the landscape would not be created or perceived as a large-scale visual change. Because restored sites attract wildlife, the visual quality of the areas would be improved.	No information incorporated. <sup>4</sup>	There are no sensitive view receptors in proximity to the Tule Red project site that would experience a substantial change in view caused by construction activities. Furthermore, construction activities would occur over a short duration (90 days) and would not occur at night. No ECs or MMs were identified in the SMP EIS/EIR impact analysis. No additional ECs or MMs are needed for Tule Red. Impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Impacts would be less than significant.

CEQA Guidelines Appendix G Impact	SMP EIS/EIR Impact	SMP EIS/EIR: Significance before Mitigation	SMP EIS/EIR: Mitigation Measures (MMs)	SMP EIS/EIR: Significance after MMs	SMP EIS/EIR Description of Restoration Activities Evaluated	SMP EIS/EIR Impact Analysis Summary	SMP Assumptions or Environmental Commitments (ECs) Identified in Impact Analysis or Chapter 2 of the SMP EIS/EIR	Tule Red Project <sup>1</sup>
	VIS-3: Changes in Views to and from Suisun Marsh	LS	None required	—	<ul style="list-style-type: none"> <li>Breaching and lowering exterior levees</li> <li>Upgrading or creating new interior levees</li> <li>Creating habitat levees</li> <li>Increasing connectivity between marsh plain and waters</li> <li>Redirecting intakes, discharges, and outfalls</li> <li>Installing fencing, brush boxes, and planted upland, riparian, and tidal vegetation</li> </ul>	Views to and from the marsh would not be greatly affected because restoration-associated landscape changes would quickly appear to be part of the existing visual landscape and would not alter the visual character of the marsh. Restored lands with increased public access would improve the aesthetic quality of the marsh and increase the availability of those aesthetic resources.	No information incorporated	Same as Impact VIS-2. No additional ECs or MMs are needed for Tule Red. Impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Impacts would be less than significant.
b.) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	VIS-4: Damage to Scenic Resources along Scenic Highway	NI	—	—	No description of specific restoration activities. <sup>5</sup>	There is no roadway in or near the plan area that is designated in California plans as a Scenic Highway or route worthy of protection for maintaining and enhancing scenic viewsheds. Although State Route 12 is a county-designated scenic route, views along the roadway could improve with marsh restoration.	No information incorporated	Similar to the SMP EIS/EIR impact analysis, no roadway in or near the project site is designated in California plans as a Scenic Highway or route worthy of protection for maintaining and enhancing scenic viewsheds. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Impacts would be less than significant.
d.) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	VIS-5: Create a New Source of Light and Glare That Affects Views in the Area	LS	None required	—	No description of specific restoration activities other than a general reference to the installation of permanent lighting features and the use of portable lighting and maintenance vehicles at night.	There would be a small increase in glare due to increased water surface area, but this would be negligible relative to the whole of the marsh. Actions that require the installation of permanent lighting and restoration activities at night that require the use of lighting would be a source of light, and new buildings could create glare and introduce inappropriate building materials, finishes, or colors.	<b>Same as Impact VIS-1: Environmental Commitment: Visual/Aesthetic Best Management Practices</b>	Same as Impact VIS-1. Impacts would be less than significant.
a.) Have a substantial adverse effect on a scenic vista.	VIS-6: Conflict with Policies or Goals Related to Visual Resources	NI	—	—	No description of specific restoration activities.	The SMP is consistent with the intent and purpose behind the establishment of the policies and goals created to help protect and enhance the aesthetic value of the marsh. Furthermore, the actions would aid in the facilitation of goals to preserve and enhance the aesthetic resources of the marsh and, therefore, improve views of, from, and within the marsh.	No information incorporated	Same as Impact VIS-2 and Impact VIS-4. No additional ECs or MMs are needed for Tule Red. Impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Impacts would not occur.

CEQA Guidelines Appendix G Impact	SMP EIS/EIR Impact	SMP EIS/EIR: Significance before Mitigation	SMP EIS/EIR: Mitigation Measures (MMs)	SMP EIS/EIR: Significance after MMs	SMP EIS/EIR Description of Restoration Activities Evaluated	SMP EIS/EIR Impact Analysis Summary	SMP Assumptions or Environmental Commitments (ECs) Identified in Impact Analysis or Chapter 2 of the SMP EIS/EIR	Tule Red Project <sup>1</sup>
<b>AGRICULTURAL RESOURCES (NONE)<sup>1</sup></b>								
a.) Convert prime farmland, unique farmland, or farmland of statewide importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use.	None.	None.	—	—	None.	None. The SMP EIS/EIR did not analyze this specific Appendix G impact as activities under the SMP would not affect agriculture because there is no agriculture within the managed wetland areas or potential tidal restoration areas.	None.	The Tule Red project site has no agricultural lands and has never been used for agricultural purposes. Therefore, the Tule Red project has no ability to affect agricultural lands. Impacts would not occur.
b.) Conflict with existing zoning for agricultural uses or a Williamson Act contract.								
c.) Conflict with existing zoning for, or cause rezoning of, forestland.								
d.) Result in the loss of forestland or conversion of forestland to non-forestland.								
e.) Involve other changes in the existing environment that, because of their location or nature, could result in the conversion of farmland to non-agricultural use or the conversion of forestland to non-forestland.								

CEQA Guidelines Appendix G Impact	SMP EIS/EIR Impact	SMP EIS/EIR: Significance before Mitigation	SMP EIS/EIR: Mitigation Measures (MMs)	SMP EIS/EIR: Significance after MMs	SMP EIS/EIR Description of Restoration Activities Evaluated	SMP EIS/EIR Impact Analysis Summary	SMP Assumptions or Environmental Commitments (ECs) Identified in Impact Analysis or Chapter 2 of the SMP EIS/EIR	Tule Red Project <sup>1</sup>
<b>AIR QUALITY (AIR QUALITY)<sup>1</sup></b>								
<p>a.) Conflict or obstruct implementation of the applicable air quality plan.</p> <p>b.) Violate any air quality standards or contribute substantially to an existing or projected air quality violation.</p> <p>c.) Result in a cumulatively considerable net increase in any criteria pollutants for which the project region is designated a nonattainment area under an applicable federal or state ambient air quality standard.</p>	<p>AQ-1: Generation of Construction-Related Emissions in Excess of Draft BAAQMD Standards Associated with Restoration</p>	S	<p><u>AQ-MM-1: Limit Construction Activity during Restoration</u><sup>6</sup></p> <p><u>AQ-MM-2: Reduce Construction NO<sub>x</sub> Emissions</u></p> <p><u>AQ-MM-3: Implement All Appropriate BAAQMD Mitigation Measures</u><sup>6</sup></p>	LS	<p>As a worst-case scenario, site preparation and levee breaching emissions were combined into a total daily emissions value because it is possible that two different projects could occur at the same time. The site preparation phase entails grading, improving levees, and building channels and islands. The water management phase does not include the use of heavy equipment. Levee breaching includes only one excavator.</p>	<p>Construction activities would result in a temporary increase in emissions of ROG, NO<sub>x</sub>, CO, PM10, PM2.5, and CO<sub>2</sub>. Unmitigated emissions from the site preparation phase and levee breaching phase (assumed simultaneous) exceed the BAAQMD draft construction thresholds for NO<sub>x</sub> but mitigated emissions do not.</p>	<p>Assumptions made:</p> <ul style="list-style-type: none"> <li>• Assumed operation of equipment for 8 hours per day.</li> <li>• Anticipated construction equipment (and number) for restoration:                             <ul style="list-style-type: none"> <li>○ Tractor/loader/backhoe (1)</li> <li>○ Rubber-tired dozer (1)</li> <li>○ Excavator (1)</li> <li>○ Grader (1)</li> <li>○ Box scraper (1)</li> </ul> </li> <li>• SMP assumes site preparation phase and levee breaching occur simultaneously for worst-case scenario.</li> </ul>	<p>Implementation of Tule Red restoration would require more construction equipment than accounted for in the SMP EIS/EIR analysis, as described in Chapter 2, <i>Project Description</i>, of this addendum; however, the site preparation phase (Phase I) and the breaching of the natural exterior berm (Phase II) would not take place simultaneously, as described in the SMP EIS/EIR. Further, the type of equipment used for Tule Red would be similar to that identified in the SMP EIS/EIR. In addition, Tule Red would incorporate all appropriate BAAQMD BMPs and AQ-MM-2, and AQ-MM-3 of the SMP EIS/EIR (listed in this table). The modeling of three different construction equipment scenarios indicates that none of the BAAQMD district thresholds would be exceeded during either Phase I or Phase II activities (Tables 3-5a through 3-5d). As such, AQ-MM-1 does not need to be incorporated into the Tule Red project. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant with mitigation incorporated.</p>



CEQA Guidelines Appendix G Impact	SMP EIS/EIR Impact	SMP EIS/EIR: Significance before Mitigation	SMP EIS/EIR: Mitigation Measures (MMs)	SMP EIS/EIR: Significance after MMs	SMP EIS/EIR Description of Restoration Activities Evaluated	SMP EIS/EIR Impact Analysis Summary	SMP Assumptions or Environmental Commitments (ECs) Identified in Impact Analysis or Chapter 2 of the SMP EIS/EIR	Tule Red Project <sup>1</sup>
<p>a.) Conflict or obstruct implementation of the applicable air quality plan.</p> <p>b.) Violate any air quality standards or contribute substantially to an existing or projected air quality violation.</p> <p>c.) Result in a cumulatively considerable net increase in any criteria pollutants for which the project region is designated a non-attainment area under an applicable federal or state ambient air quality standard.</p>	<p>AQ-4: Generation of Construction-Related Emissions in Excess of Draft BAAQMD Standards Associated with Restoration and Management Activities Combined</p>	S	<p><u>AQ-MM-1 through AQ-MM-3</u></p> <p><u>AQ-MM-4: Limit Construction Activity during Restoration and Management</u></p>	LS	No description of specific restoration activities.	The worst-case scenario mitigated emissions would exceed the BAAQMD draft construction thresholds for NO <sub>x</sub> if all the various restoration activity, new management activity that would increase in frequency, and new management activity were to all happen concurrently. Although multiple phases of construction can overlap, the equipment being used on the marsh at any given time should not exceed the equipment described in Tables 5.7-8 and 5.7-10 of the SMP EIS/EIR (and in the adjacent column in this table).	<ul style="list-style-type: none"> <li>Assumes restoration and management construction activity overlap.</li> <li>Assumes operation of equipment for 8 hours per day.</li> <li>Estimated construction equipment (and number) for management activity that would increase in frequency:                             <ul style="list-style-type: none"> <li>Tractor/loader/backhoe (3)</li> <li>Rubber-tired dozer (3)</li> <li>Excavator (2)</li> <li>Grader (3)</li> </ul> </li> </ul>	Similar to Impact AQ-1. In addition, the project site acreage that would be disturbed when compared to baseline conditions would be reduced, and equipment activity would be reduced when compared to baseline between construction Phases 1 and 2 because the site would be managed to promote vegetation growth or would be pre-flooded prior to the breach. Further, management activities for the project site would be overall reduced because the project site would cease to be a managed wetland once Phase 2 was complete and there would no longer be heavy construction equipment used during the summer. Therefore, the impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant with mitigation incorporated (AQ-MM-2, AQ-MM-3, and AQ-MM-4).

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d.) Expose sensitive receptors to substantial pollutant concentrations.	AQ-5: Construction-Related Diesel Health Risk Associated with Restoration	LS	None required	—	No description of specific restoration activities; however, restoration construction activities would occur between June and September over approximately 30 construction seasons.	Diesel particulate emission rates would be low, the emissions would be distributed over a large geographic area rather than clustered near any individual sensitive receptors, and construction activities would occur sporadically over a 30-year period and would not result in long-term emissions of diesel exhaust at the project sites. In addition, diesel exhaust would attenuate to levels well below acceptable exposure limits because of the distances of sensitive receptors from construction activities.	<b>Environmental Commitments: Air Quality Best Management Practices, including Basic Control Measures, Enhanced Control Measures and Additional Air Quality Best Management Practices</b>	Similar to the impact analysis in the SMP EIS/EIR, diesel particulate emission rates would be low, and the emissions would be distributed over a large geographic area. Therefore, diesel exhaust would attenuate to levels well below acceptable exposure limits. Furthermore, there are no sensitive receptors within proximity to the project site. In addition, Tule Red would incorporate the Air Quality Best Management Practices EC as described in Chapter 2, <i>Habitat Management, Preservation</i> , and Restoration Plan of the SMP EIS/EIR as described in this table, with the exception of Basic Control Measures of treating all graded surfaces to prevent nuisances from dust or spillage on roads or adjacent properties. This is because the majority of the project site would be wet or damp and would not generate substantial quantities of dust during earth moving activities. In addition, the HMMP (Impact HAZ-3) would control and reduce risk of spills. As such, the impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
d.) Expose sensitive receptors to substantial pollutant concentrations.	AQ-8: Construction-Related Diesel Health Risk Associated with Restoration and Management Activity Combined	LS	None required	—	Impacts from restoration and management activity combined would be similar to those described above under AQ-4.	Impacts from restoration and management activity combined would be similar to those described above under AQ-4	<ul style="list-style-type: none"> <li>Assumes restoration and management construction activity overlap</li> <li>Assumes operation of equipment for 8 hours per day</li> </ul>	Same as Impact AQ-1 and Impact AQ-5. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
e.) Create objectionable odors that would affect a substantial number of people.	AQ-10: Increase in Construction-Related Odors	LS	None required	—	Described some ground-disturbing activities and disposal and settling of dredged material.	Any odor generated from dredging spoils would not be any more objectionable than the naturally occurring odors around the marsh. Also, ECs related to dust would minimize the potential for odor generation.	<b>Environmental Commitment: Air Quality Best Management Practices Basic Control Measure, specifically: Treat all graded surfaces to prevent nuisances from dust or spillage on roads or adjacent properties</b>	The Tule Red project site is a managed wetland site. The majority of the site would be wet when ground-distributing activities would take place. Thus, controlling dust by wetting down the site would not be appropriate, would not be needed, and would not control odor. Further, there are no sensitive receptors located on the adjacent properties. Therefore, implementation of the SMP EIS/EIR EC

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<b>BIOLOGICAL RESOURCES (FISH, VEGETATION, WETLANDS, AND WILDLIFE)<sup>1</sup></b>								
<p>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 by CDFW or USFWS.</p> <p>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.</p>	<p>FISH-1: Construction-Related Temporary Impairment of Fish Survival, Growth, and Reproduction by Accidental Spills or Runoff of Contaminants (Heavy Metals)</p>	<p>LS</p>	<p>None required</p>	<p>—</p>	<p>Levee construction and breaching (August 1–November 30 [work window for special-status fish species]) and use of equipment near water.</p>	<p>Disturbance of sediment in and around sloughs most likely would result in a release of sediments into the slough channels and possibly a release of soil contaminants into the water column. Refueling, operating, and storing construction equipment could result in accidental spills of pollutants such as hydraulic fluids, oil, or fuel. Pollutants entering water bodies in the plan area would cause mortality to, and reduced growth of, the egg, larval, and juvenile life stages of fish. These pollutants could adversely affect the movement of special-status fish species.</p>	<p>Assumption:</p> <ul style="list-style-type: none"> <li>Larval and juvenile delta smelt would not be present August 1–November 30 because most spawning occurs in the spring.</li> </ul> <p><b>Environmental Commitments:</b></p> <ul style="list-style-type: none"> <li>Erosion and sediment control plan</li> <li>SWPPP</li> <li>Hazardous Materials Management Plan (HMMP)</li> <li>Spoils disposal plan</li> <li>Worker training</li> <li>Construction Period Restrictions: Limit in-water work to August 1–November 30</li> </ul>	<p>Construction of Phases 1 and 2 would follow the SMP EIS/EIR ECs to minimize impacts on fish. Phase 1 construction would occur on the landside of the natural berm and open waters, and fish species would generally be protected from these activities. In addition, an HMMP would be included in the SWPPP; however, the HMMP would not include implementation of a Risk Management Plan (RMP). This is because Tule Red is not a large-scale project. The HMMP and SWPPP would reduce the potential for pollutants entering waterways. The project site has had limited herbicide application to control phragmites on-site over the years, as allowed by permits. As discussed in Impact WQ-4, methylmercury production may increase after the breach, which could affect fish; however, over time, it is expected to reduce given the conversion of managed wetlands to tidal habitat. In addition, Phase 2 construction would occur between August 1 and November 30, as prescribed by the EC, and would not expose the most sensitive life stages of special-status species to pollutants in the water. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>

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	FISH-2: Construction-Related Temporary Reduction of Special-Status Fish Rearing Habitat Quality or Quantity through Increased Input and Mobilization of Sediment	LS	None required	—	Levee construction, levee breaching, placement of riprap, and dredging	Construction activities would release sediments into sloughs and Suisun Bay, resulting in direct impacts on resident fishes through gill damage and reduced capacity to take in oxygen. Indirect impacts could include reduced fitness as a result of decreased DO intake, increased metabolic costs associated with reduced DO intake ability, and reduced foraging due to decreased visibility.	Assumption: <ul style="list-style-type: none"> <li>Delta smelt, longfin smelt, green sturgeon, and Sacramento splittail may occur year-round in the marsh.</li> </ul> <b>Environmental Commitments:</b> <ul style="list-style-type: none"> <li>Standard Design Features and Construction Practices</li> <li>Erosion and sediment control plan</li> <li>SWPPP</li> <li>Worker training</li> <li>Construction Period Restrictions: Limit in-water work to August 1–November 30</li> <li>HMMP</li> </ul>	The ECs identified for this impact in the SMP EIS/EIR impact analysis are described in Appendix B of this document and are the same as described in Appendix F, <i>Mitigation Monitoring and Reporting Program</i> , and in Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i> , of the SMP EIS/EIR and would be implemented as part of the Tule Red project. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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FISH-3: Short-Term Impairment of Delta Smelt Passage and Reduced Availability of Spawning and Rearing Habitat Resulting from Changes in Channel Morphology and Hydraulics Attributable to Restoration Activities	LS	None required	—	Levee breaching.	Project actions could produce tidal velocities in excess of the sustained swimming speed of several sensitive fish species. Long-term impacts of velocity changes in the sloughs as a result of levee breaching could preclude delta smelt from rearing habitat, depending on the breach location and size. A major change in velocities could have a significant impact on the availability of delta smelt habitat. As the restored area evolves into a functioning tidal marsh, it is expected to provide indirect benefits through exported pelagic production for delta smelt. Additionally, restoration activities most likely would be located throughout the marsh and implemented over the 30-year plan period rather than concentrated in a small geographic area or time frame. As such, only minimal changes in delta smelt habitat in the marsh would occur at any one time. Overall, delta smelt are expected to benefit; thus, minor temporary losses of habitat would be compensated for through restoration.	<p>Assumptions:</p> <ul style="list-style-type: none"> <li>• Levee breaching would occur from August 1 to November 30 when delta smelt larvae and juveniles are larger and can avoid adverse effects.</li> <li>• Velocity changes would be addressed adaptively through modifications in breached areas.</li> <li>• Final designs will attempt to account for potential adverse hydrologic modifications. This information will be used to modify or maintain levee breaches as needed to support fish passage and access to rearing habitat for delta smelt.</li> </ul> <p><b>Environmental Commitments:</b></p> <ul style="list-style-type: none"> <li>• <b>Any adverse effects on special-status fish species and/or critical habitat will be addressed by the project proponent</b></li> <li>• <b>Any additional measures will be in compliance with ESA.</b></li> </ul>	<p>The Tule Red project is not expected to produce tidal velocities in excess of the sustained swimming speed of several sensitive fish species (e.g., delta smelt). The velocity accelerations expected in the pelagic zone that delta smelt and other fish inhabit is less than the 1 fps design guidance of the SMP EIS/EIR. If fish do enter the project site, it would have roughened vegetated channel margins, which would provide respite from higher velocities (i.e., 2 to 3 fps) and allow the fish to move out of the site on the ebb tide and return back to relatively calm Grizzly Bay. In addition, the Tule Red project would implement all terms and conditions of the NMFS Programmatic Biological Opinion, except the terms and conditions for Reasonable and Prudent Alternative (RPA) 3 of the NMFS Programmatic Biological Opinion, because they are not applicable to the project for the following reasons:</p> <ul style="list-style-type: none"> <li>• The Tule Red Restoration Project is in Region 4 of the Suisun Marsh Plan (RPA 3a)</li> <li>• The written annual reports are prepared by the Bureau of Reclamation (RPA 3b).</li> </ul> <p>The Tule Red project would implement the programmatic conservation measures identified in the USFWS Programmatic Biological Opinion that may be applicable to special-status fish species. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>	

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	FISH-4: Short-Term Impairment of Chinook Salmon Passage and Reduced Availability of Rearing Habitat Resulting from Changes in Channel Morphology and Hydraulics Attributable to Restoration Activities	LS	None required	—	Levee breaching.	Modeling suggested that levee breaches in certain locations could result in velocity modifications in excess of the sustained swimming speeds of juvenile salmon and outside NMFS criteria of 2 feet per second for stream velocities with longer fish passageways (National Marine Fisheries Service 2001). The analysis suggests that velocity modifications would exceed these criteria only in Hunters Cut.	<p>Assumptions:</p> <ul style="list-style-type: none"> <li>• Velocity changes would be addressed adaptively through modifications to breached areas.</li> <li>• Final designs will attempt to account for potential adverse hydrologic modifications. This information will be used to modify or maintain levee breaches as needed and support fish passage and access to rearing habitat for delta smelt.</li> </ul> <p><b>Environmental Commitments:</b></p> <ul style="list-style-type: none"> <li>• <b>Any adverse effects on special-status fish species, critical habitat, or essential fish habitat (EFH) will be addressed by the project proponent.</b></li> <li>• <b>Any additional measures will be followed in compliance with CESA, ESA, and EFH</b></li> </ul>	Similar to Impact FISH-3, the conservation measures in the NMFS and USFWS Biological Opinions would be incorporated in implementation of the Tule Red project, including the timing restriction for delta smelt and longfin smelt, which would avoid in-water construction in the winter and spring months when the most sensitive life stages (larvae and early juveniles) of special-status species are likely to be present in Grizzly Bay. In addition, the velocity accelerations expected in the pelagic zone, an area that delta smelt and other fish inhabit, are predicted to be less than the 1 fps design guidance of the SMP EIS/EIR. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-5: Short-Term Impairment of Steelhead Passage and Reduced Availability of Rearing Habitat Resulting from Changes in Channel Morphology and Hydraulics Attributable to Restoration Activities	LS	None required	–	Levee breaching	Various breach locations were modeled, and changes in velocities only rarely exceeded steelhead capabilities to swim upstream.	<p>Assumptions:</p> <ul style="list-style-type: none"> <li>• Velocity changes would be addressed adaptively through modifications to breached areas.</li> <li>• Migratory pathways will be maintained.</li> </ul>	Same as Impact FISH-4. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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	FISH-6: Short-Term Impairment of Green Sturgeon Passage and Reduced Availability of Holding and Rearing Habitat Resulting from Changes in Channel Morphology and Hydraulics Attributable to Restoration Activities	LS	None required	—	No description of specific restoration activities, but it appears that the discussion is referring to levee breaching.	Green sturgeon are strong bottom-oriented swimmers; it is unlikely they would be affected by temporary changes in hydraulics.	Assumptions: <ul style="list-style-type: none"> <li>• Velocity changes would be addressed adaptively through modifications to breached areas.</li> <li>• Migratory pathways will be maintained.</li> </ul>	Same as Impact FISH-3. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-7: Short-Term Impairment of Sacramento Splittail Passage and Reduced Availability of Rearing Habitat Resulting from Changes in Velocity Attributable to Restoration Activities	LS	None required	—	No description of specific restoration activities, but the discussion is referring primarily to levee breaching.	Depending on the age and size of the splittail in the restoration areas, young splittail would most likely be excluded from edge habitat if velocities are high and vegetation is absent. However, restoration designs will incorporate vegetation on benches and berms (habitat levees or other intertidal habitat), which would provide some rearing habitat and young splittail may also move to more favorable habitat within the marsh. They are not likely to be affected by temporary changes in velocities.	Assumptions: <ul style="list-style-type: none"> <li>• Velocity changes would be addressed adaptively through modifications to breached areas.</li> <li>• Migratory pathways will be maintained.</li> </ul>	Same as Impact FISH-3. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-8: Short-Term Impairment of Longfin Smelt Passage and Reduced Availability of Rearing Habitat Resulting from Changes in Velocity Attributable to Restoration Activities	LS	None required	—	Levee breaching.	Juveniles and adults may move out into the ocean during the summer and fall months when breaching activities occur. They would probably be unaffected by temporary changes in velocities.	Assumptions: <ul style="list-style-type: none"> <li>• Velocity changes would be addressed adaptively through modifications to breached areas.</li> <li>• Migratory pathways will be maintained.</li> </ul>	Same as Impact FISH-3. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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	FISH-9: Temporary Reduction of Delta Smelt Habitat Quantity or Quality through Removal and Destruction of Cover Attributable to Restoration Activities	LS	None required	—	Levee reconstruction and breaching.	Levee breaching would affect only small areas, and scouring impacts on aquatic vegetation would be minimal compared to existing and created habitat. If the removal of aquatic vegetation or instream woody material from slough channels is necessary in breach locations, this could temporarily remove cover that is an important component of adult spawning and juvenile rearing habitat. However, the restoration designs would include habitat levees or other intertidal habitat that would provide vegetative cover upon breaching, thus offsetting any losses along the slough channel. Because the restoration activities would occur throughout the marsh and be implemented over 30 years, only minimal changes in delta smelt habitat would occur at any time.	No information incorporated	Similar to the SMP EIS/EIR, levee breaching under the Tule Red project would affect only a small area (50 to 120 feet in length along the natural berm adjacent to Grizzly Bay) when compared to the entire project site and the entire Suisun Marsh. Scouring impacts on aquatic vegetation would be minimal compared to existing and created habitat. As described in Appendix D.2, the proposed project is designed to experience some erosion to achieve natural equilibrium. Furthermore, the restoration design includes a habitat levee and other intertidal habitat (tidal pans) that would provide vegetative cover after breaching. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-10: Temporary Reduction of Chinook Salmon Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	Project activities are not expected to reduce cover for juvenile Chinook salmon. Project activities would be outside of the riparian vegetation zone and located in brackish water areas. Juveniles would directly use restoration stages, such as subtidal, low-intertidal, and low-marsh areas. Mid-marsh and high-marsh areas most likely will increase secondary production in the marsh, which would benefit juvenile Chinook salmon. Restoration stages that improve marsh connectivity could be used directly for Chinook salmon migration and emigration. Restoration activities most likely would be located throughout the marsh and implemented over 30 years. As such, only minimal changes in Chinook salmon habitat would occur at any one time. Adjacent areas would continue to provide suitable habitat in the interim between breaching the levee and a fully functioning tidal marsh.	No information incorporated	Similar to SMP EIS/EIR, restoration activities would be outside of the riparian vegetation zone and located in brackish water areas of an existing managed wetland. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.



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FISH-11: Temporary Reduction of Steelhead Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	Cover is not anticipated to be removed in Suisun or Honker Bays. Tidal marsh restoration activities in smaller sloughs could affect rearing or migration during the period of time juveniles would be migrating downstream. However, any in-channel work will be conducted in the months that adult and juvenile steelhead are not present.	No information incorporated	Similar to the SMP EIS/EIR, cover would not be removed in Suisun or Honker Bays because the project site is not located near those areas. Furthermore, restoration activities would not occur in smaller sloughs adjacent to the existing managed wetland site. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.	
FISH-12: Temporary Reduction of Green Sturgeon Habitat Quantity or Quality as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	Restoration actions would not be likely to affect migrating sturgeon. However, resulting changes in habitat conditions could have an impact on habitat attributes because of changes in nutrient inputs and benthic communities. Restoration stages would most likely increase prey production in the marsh, which would increase food availability for sturgeon. Restoration activities would most likely be located throughout the marsh and implemented over 30 years. As such, only minimal changes in green sturgeon habitat would occur at any one time.	No information incorporated	The Tule Red project would be located in low-marsh, low-intertidal, and subtidal marsh areas and therefore may increase food availability for sturgeon. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.	
FISH-13: Temporary Reduction of Sacramento Splittail Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	LS	None required	—	Primarily levee breaching.	Project activities that remove aquatic vegetation could affect splittail spawning and rearing. As the restored area evolves into a functioning tidal marsh, it is expected to provide permanent, sustainable, suitable habitat for splittail. Additionally, restoration activities most likely would be located throughout the marsh and implemented over 30 years. As such, only minimal changes in splittail habitat in the marsh would occur at any one time. Adjacent areas would continue to provide suitable habitat in the interim between breaching the levee and creating a fully functioning tidal marsh.	No information incorporated	Similar to the SMP EIS/EIR, levee breaching under the Tule Red project would affect only small area (50 to 120 feet in length along the natural berm) when compared to the entire project site and the entire Suisun Marsh. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.	

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	FISH-14: Temporary Reduction of Longfin Smelt Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	Longfin smelt are primarily a pelagic species; therefore, it is unlikely they use cover such as aquatic vegetation or other in-water structures provided by the marsh.	No information incorporated	The Tule Red project would not affect the pelagic zone, which is used primarily by longfin smelt. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-15: Improved Fish Habitat Due to Increased Dissolved Oxygen Concentrations in Tidal Channels Attributable to Restoration Activities	Beneficial	None required	—	No description of specific restoration activities.	Restoration activities that convert managed wetlands to tidal wetlands, especially those in areas with poor circulation or other conditions leading to low levels of DO, will promote increased water circulation and decrease the amount of high-sulfide water discharged from managed wetlands into sloughs.	No information incorporated	The conversion of managed wetlands to tidal wetlands would reduce anthropogenic management and resulting disturbances, which have been linked to low DO and high dissolved organic carbon in Suisun Marsh. Seasonal DO variations in the marsh occur, with most DO depressions occurring in early summer and fall. Measured DO data on the project site indicate that very low DO has been documented in October (fall) and March, April, May (spring). The Tule Red project is not expected to further reduce DO levels from their current low levels because managed wetland activities would cease once the project site is restored. An increase in tidal prism and flushing and reduced residence time is expected to result in increased DO concentrations. In addition, improving the low DO problem from the CDFW drain through installation of a spray aeration structure on the existing outlet pipe and constructing a pooling area is expected to increase DO concentrations. Continued DO monitoring and biochemical oxygen demand sampling would ensure maintained DO concentrations downstream (Appendix C). The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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	FISH-16: Salinity-Related Reduction of Delta Smelt Survival, Growth, Movement, or Reproduction Attributable to Restoration Activities	LS	None required	—	No description of specific restoration activities but includes levee breaching.	<ul style="list-style-type: none"> <li>The magnitude of the salinity effects would depend on the location (and breach connection) of the new tidal wetlands and the size (acreage) of the new tidal wetlands.</li> <li>Restoration with tidal connection to Suisun Bay or Honker Bay may have the largest salinity effects. The effects would be greatest during periods of low delta outflow when Suisun Bay salinity is highest and the salinity gradient within Suisun Bay and along Montezuma Slough is strongest.</li> <li>Changes in salinity as a result of levee breaching could affect special-status fish species, but preliminary modeling results suggest that most salinity changes as a result of project activities would be well within the environmental tolerance for delta smelt.</li> <li>Salinity changes in the existing marsh sloughs would depend on the additional tidal restoration upstream and downstream from the stations as well as the location within the marsh.</li> <li>There is some potential for small-scale hydrologic modifications that could produce a microcline of low salinity, especially where activities isolate freshwater inputs. These modifications would create habitats and habitat types suitable for delta smelt spawning. However, the potential also exists for those lower salinity zones to attract delta smelt but not be suitable for spawning because of structural, predator, or other issues.</li> </ul>	<p>Assumptions:</p> <ul style="list-style-type: none"> <li>Seasonal magnitude of salinity in the marsh would continue to be governed primarily by delta outflow and operation of the SMSCG.</li> <li>Restoration areas will be modeled to determine the appropriate breach sizes and locations. Salinity changes will be addressed adaptively through modifications to breached areas. Final designs will attempt to account for potential adverse hydrologic modifications.</li> </ul> <p><b>Environmental Commitments:</b></p> <ul style="list-style-type: none"> <li><b>Any adverse effects on special-status fish species, critical habitat, or EFH will be addressed by the project proponent.</b></li> <li><b>Any additional measures will be followed in compliance with CESA, ESA, and EFH</b></li> </ul>	The Tule Red project is not located in Suisun Bay or Honker Bay. The Tule Red project was modeled using the RMA Bay-Delta Model (the same model used in the SMP EIS/EIR). The difference between the baseline and the simulated project condition results in the 2002–2003 period being very small when compared to baseline conditions. Maximum differences depend on the location simulated but range between -1.0% and +0.7% (Appendix D.1). Given the very small maximum differences between the simulated baseline conditions and project conditions at the different modeled locations, salinity-related reduction of delta smelt survival, growth, movement, or reproduction is not anticipated. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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	FISH-17: Salinity-Related Reduction of Chinook Salmon Survival, Growth, or Movement as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities but includes levee breaching.	There is little or no risk of adverse impacts attributable to water quality or salinity changes associated with restoration activities because of the seasonal timing of the breach and preliminary modeling and design of breach sites.	No information incorporated	Same as Impact FISH-16. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-18: Salinity-Related Reduction of Steelhead Survival, Growth, or Movement as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	Because substantial changes in salinity are not expected, and because so few steelhead have been caught in Suisun Marsh, it is unlikely they would be affected by salinity changes. If steelhead were to encounter water quality changes due to restoration activities, it is unlikely they would be affected because they have a large tolerance to salinity changes.	No information incorporated	Same as Impact FISH-16. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-19: Salinity-Related Reduction of Green Sturgeon Survival, Growth, or Movement as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	The salinity tolerance range of green sturgeon is sufficiently large, and their residence in the plan area is sufficiently short. There is little or no risk to green sturgeon associated with restoration activities.	Per Chapter 2 of the SMP EIS/EIR description of restoration, restoration areas will be modeled to determine the appropriate breach sizes and locations. Salinity changes will be addressed adaptively through modifications of breached areas. Final designs will attempt to account for potential adverse hydrologic modifications.	Same as Impact FISH-16. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-20: Salinity-Related Reduction of Sacramento Splittail Survival, Growth, Movement, or Reproduction as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	There is some risk that restoration actions would generate high-salinity zones outside of the tolerances of Sacramento splittail; however, preliminary modeling suggests that this is unlikely.	Per Chapter 2 of the SMP EIS/EIR description of restoration, prior to implementation, preliminary modeling and design of the potential breach areas will be done to assess effects on hydrologic conditions.	Same as Impact FISH-16. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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	FISH-21: Salinity-Related Reduction of Longfin Smelt Survival, Growth, Movement, or Reproduction as a Result of Restoration Activities	LS	None required	—	No description of specific restoration activities.	Longfin smelt typically do not use the plan area to spawn, and none of the modeled scenarios results in an increase of salinity greater than 15 parts per thousand. Therefore, there is little or no risk that this taxon would be affected by salinity changes attributable to restoration activities.	Per Chapter 2 of the SMP EIS/EIR description of restoration, prior to implementation, preliminary modeling and design of the potential breach areas will be done to assess effects on hydrologic conditions.	Same as Impact FISH-16. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	FISH-22: Disturbance, Injury, or Mortality of Individual Fish Resulting from Work Adjacent to Bodies of Water	LS	None required	—	<ul style="list-style-type: none"> <li>• Removal and disturbance of aquatic vegetation</li> <li>• Creation and/or modification of exterior levees</li> <li>• Breaching of levees</li> <li>• Movement of construction equipment and personnel</li> <li>• Temporary lighting</li> <li>• Grading,</li> <li>• Construction of access roads and staging areas</li> </ul>	The effect of disturbance on fish depends on the sensitivity of the species' life stage and the duration and frequency of disturbance. Disturbance may reduce feeding, interfere with reproduction, and cause movement from habitat. Movement could result in mortality attributable to predation. Long-term disturbance over a substantial proportion of a species' habitat may reduce species population abundance, distribution, and production.	<b><u>Environmental Commitments and BMPs:</u></b> <ul style="list-style-type: none"> <li>• <b>Construction Related Restrictions: In-water activities will be conducted between August and November</b></li> <li>• <b>Instream work will focus on high temperature periods (i.e., August 1 through November 30) when most special-status fish species are absent from the shallow-water habitat in the plan area (BMP)</b></li> <li>• <b>Any adverse effects on special-status species, critical habitat, or EFH attributable to construction activities may require implementation of additional avoidance or MMs. NMFS, USFWS, and CDFW will be consulted, and additional avoidance and MMs may be implemented on a site-specific basis.</b></li> <li>• <b>Worker training</b></li> <li>• <b>Standard design features and construction practices</b></li> <li>• <b>Access point/staging areas</b></li> <li>• <b>Erosion and Sediment Control Plan</b></li> <li>• <b>SWPPP</b></li> <li>• <b>HMMP</b></li> </ul>	Same as Impact FISH-1 with respect to the HMMP and SWPPP. Same as FISH-3 with respect to the NMFS Programmatic Biological Opinion and USFWS Programmatic Biological Opinion. The Tule Red Restoration Project would implement the ECs and BMPs identified in the SMP EIS/EIR for this impact. For the Access Point/Staging Areas EC, <sup>9</sup> the staging areas will also be identified in construction drawings. For the Standard Design Features and Construction Practices EC, <sup>10</sup> the following revision will be made: <i>"Minimizing degradation of wetland habitats where feasible by minimizing the disturbance footprint"</i> Given that this EC identified, where feasible, and the fact that impacts to wetland habitat would be less than significant (Impact VEG-3), the change to the EC would not result in a change to the impact determination. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

<sup>9</sup> Staging areas will have a stabilized entrance and exit and will be located at least 100 feet from bodies of water unless site-specific circumstances do not provide such a setback, in which case the maximum setback possible will be used. If an off-road site is chosen, qualified biological and cultural resources personnel will survey the selected site to verify that no sensitive resources would be disturbed by staging activities. If sensitive resources are found, an appropriate buffer zone will be staked and flagged to avoid impacts. If impacts on sensitive resources cannot be avoided, the site will not be used. An alternate site will be selected.

<sup>10</sup> Minimizing degradation of wetland habitats where feasible, i.e., work will be conducted from levee crown.

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FISH-23: Change in Fish Species Composition Attributable to Changes in Salinity or Water Quality from Managed or Natural Wetland Modifications	LS	None required	—	No description of specific restoration activities.	Habitat modification as a result of restoration activities could have a negative impact on species composition because of changing water quality conditions. However, preliminary modeling suggests that the resulting salinity conditions would be within the normal range for the plan area, and previously published literature suggests that the habitat types created as a result of restoration activities would be suitable for and beneficial to sensitive fish species resident in Suisun Marsh.	Per Chapter 2 of the SMP EIS/EIR description of restoration, prior to implementation, preliminary modeling and design of the potential breach areas will be done to assess effects on hydrologic conditions.	Same as Impact FISH-16. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.	
FISH-24: Change in Benthic Macroinvertebrate Composition Attributable to Changes in Channel Morphology and Hydraulics as a Result of Tidal Restoration	LS	None required	—	No description of specific restoration activities.	Benthic invertebrate composition could change if channel morphology and hydraulics change as a result of restoration. Higher velocities could occur at certain places in the channel, and if that occurs, the habitat could attract and retain a modified benthic macroinvertebrate community. However, preliminary modeling suggests that the project actions would result in minimal long-term hydrologic modifications.	Per the conceptual model for the SMP, an appropriate level of benthic monitoring or a benthic community evaluation will be conducted and associated with the final site-specific breach design and anticipated influence on existing slough channel modifications from the tidal restoration actions, as needed. This monitoring or evaluation will be implemented to determine effects from tidal restoration activities on the macroinvertebrate community and to ensure that impacts do not exceed the thresholds identified above.	The benthic monitoring is actually part of conceptual model for the marsh and is one of the topics that needs further investigation as part of adaptively managing the restoration projects that occur in the marsh. Tule Red would not incorporate a benthic monitoring component but would monitor various other aspects through adaptive management and provide AMAT, FAST, and other interested parties information regarding restoration progress and meeting the goals and objectives of the project. Impacts would be less than significant.	
FISH-25: Change in Primary Productivity as a Result of Tidal Restoration	Beneficial	—	—	No description of specific restoration activities.	Project activities would benefit the actual or available primary productivity of the plan area as a whole by increasing nutrient exchange and nutrient turnover rates. Nutrient levels would increase in an area where water quality is improved. In theory, primary production would increase, and zooplankton would respond, assuming the system is bottom-up controlled.	No information incorporated	The proposed project is designed to benefit fish species by producing food resources (e.g., detritus, phytoplankton, invertebrates) (ESA 2015). As such, it is expected to increase food production. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.	

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<p>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 CDFW or USFWS.</p> <p>e.) Conflict with local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance.</p>	<p>VEG-1: Short-Term Loss or Degradation of Tidal Wetlands and Tidal Perennial Aquatic Communities in Slough Channels Downstream of Restoration Sites as a Result of Increased Scour</p>	LS	None required	—	<ul style="list-style-type: none"> <li>Levee breaching</li> <li>Lowering existing levees</li> </ul>	<p>Temporary increased scour could occur as a result of greater flows near breach sites and, as a result, existing tidal wetlands in the vicinity of the affected levee sections may be affected (e.g., temporary conversion of a small amount of tidal wetlands to tidal perennial aquatic habitat). Furthermore, existing tidal perennial aquatic habitat may be degraded because of increased scour. However, tidal wetland restoration sites would more than offset any temporary loss or degradation of tidal wetland habitat or tidal perennial aquatic habitat.</p>	<p>Breach locations would be chosen to minimize upstream tidal muting, tidal elevation changes, channel scour, and hydraulic changes.</p>	<p>The breach location for the Tule Red project was selected to meet the biological goals and objectives of restoring the project site while ensuring tidal velocities, scour, and erosion do not adversely affect off-site areas. The Tule Red project is not expected to increase scour downstream. Modeling results predict that, in Grizzly Bay (modeled at approximately 1,500 feet out into the bay from the site), velocities are only 0.2 fps. The 0.2 fps velocity is consistent with existing-condition velocities, indicating the local impacts on velocity do not extend out this far. The results of the numerical modeling and observations of other tidal marsh sites around Suisun and San Pablo Bay do not indicate that a scour hole is likely to form at the entrance to project site. The invert of the tidal channel across the mud flat is typically higher than inside the marsh itself. As the flow moves out of the marsh and onto the mud flat, it is less laterally confined, reducing the unit discharge, velocity, and, therefore, applied hydraulic shear stress. This reduces the likelihood of a deeper scour hole forming. Surveys from the Sonoma Wetlands project show typical channel depths across the mud flat of a few feet. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>

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	VEG-2: Loss or Degradation of Tidal Wetlands Adjacent to Restoration Sites as a Result of Levee Breaching/ Grading	LS	None required	—	<ul style="list-style-type: none"> <li>• Levee breaching</li> <li>• Lowering existing levees</li> </ul>	Existing tidal wetlands in the vicinity of the affected levee sections may be lost because of construction-related activities. Although a relatively small amount of tidal wetlands may be lost or degraded during levee breaching, the restoration of tidal action would restore a much greater acreage of tidal wetland habitat than would be affected.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. A relatively small amount of tidal wetlands may be lost or degraded during levee breaching (between 50 and 120 linear feet); the restoration of tidal action would restore a much greater acreage of tidal wetland habitat than would be affected (a gain of 334 acres, for a total of 454 acres of tidal wetlands). No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
	VEG-3: Loss of Managed Wetlands as a Result of Tidal Wetland Restoration	LS	None required	—	<ul style="list-style-type: none"> <li>• Levee breaching</li> <li>• Lowering existing levees</li> <li>• Construction of habitat levees, benches, and other features</li> </ul>	<p>There would be an overall decrease in the quantity of managed wetlands (5,000–7,000 acres) in Suisun Marsh. The construction of habitat levees or other levees may result in fill of managed wetlands, but this would not result in a loss of jurisdictional wetlands because the managed wetlands would be converted to tidal wetlands and associated open water habitat and include the removal of some exterior levees.</p> <p>The construction of habitat levees, benches, and other features would provide some of the functions and values as the managed wetlands. The tidal wetlands would provide habitat and food sources that benefit tidal wetland-dependent species and many, but not all, managed wetland-dependent species.</p>	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Although project implementation would result in temporary disturbance of wetlands due to construction and a net loss of up to 10 acres of waters of the United States, the overall structure and function of the tidal wetland ecosystem, including tidal exchange and foodweb production, is determined to be substantially increased in both quantity and quality (ESA 2015). As such, the restoration design of the proposed project meets the SMP EIS/EIR intent of including habitat levees, benches, and other features that would provide some of the functions and values as the managed wetlands. As the tidal wetlands become established, they would increase a variety of wetland functions and values. Overall, there would continue to be approximately 52,000 acres of managed wetlands in Suisun Marsh and approximately 28,294 acres in Region 4 (where the project site is located), which would provide the type of function and value associated with managed wetlands. Therefore, considering the function and value the tidal wetlands would provide, as well as the number of acres converted in Region 4 (approximately 1%), impacts on managed wetlands would be less than significant.



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	VEG-4: Loss of Upland Plant Communities and Associated Seasonal Wetland Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	<ul style="list-style-type: none"> <li>• Levee breaching</li> <li>• Lowering existing levees</li> </ul>	Levee breaching or the lowering of existing levees may disturb upland plant communities that occur on the interior levee surfaces or on natural or altered land surfaces protected by the levees. Natural seasonal wetlands may occur in the upland communities or adjacent to the marsh.	Upland areas and associated natural seasonal wetland habitat would be protected. This includes the selection of breach sizes and locations in consideration of habitats that would be affected.	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. As documented in Appendix E, <i>Special-Status Plant Species Surveys</i> , of this document and Figure 3-1, the current site of the breach is composed of primarily non-upland plant communities (i.e., tule). No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.

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	VEG-5: Spread of Noxious Weeds as a Result of Restoration Construction	LS	None required	—	No description of specific restoration activities.	Soil-disturbing activities during construction could promote the introduction of plant species that currently are not found in the project area, including exotic pest plant species.	<p>Proposed restoration sites would be managed to promote tidal wetland vegetation so that when inundation occurs, there would be minimal potential to support nonnative species.</p> <p><b><u>Environmental Commitments: Non-Native Plant Control, including:</u></b></p> <ul style="list-style-type: none"> <li>• Use certified weed-free imported erosion control materials (or rice straw in upland areas)</li> <li>• Coordinate with county agricultural commissioner and land management agencies to ensure that appropriate BMPs are implemented</li> <li>• Educate construction supervisors and managers on weed identification and the importance of controlling and preventing the spread of noxious weeds</li> <li>• Clean equipment at designated wash stations after leaving noxious weed infestation areas</li> <li>• Treat isolated infestations of noxious weeds identified in the project area with approved eradication methods at an appropriate time to prevent further formations of seeds, and destroy viable plant parts and seed</li> <li>• Minimize surface disturbance to the greatest extent possible</li> <li>• Use certified weed-free native mixes for any necessary restoration planting or seeding, as provided in the revegetation plan developed in cooperation with CDFW. Mulch with certified weed-free mulch. Rice straw may be used to mulch upland areas.</li> <li>• Use native, noninvasive species or nonpersistent hybrids in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing</li> </ul>	<p>The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Currently, there are known invasive species at the project site, including phragmites (<i>Phragmites australis</i>), which is controlled on the project site during the summer management period by herbicide application during flowering. Many of the occurrences of phragmites are on the natural berm adjacent to Grizzly Bay, which cannot be removed without undermining the structural integrity of the berm. This would compromise the design and objectives of the proposed project. Although phragmites is an invasive species that is known for capitalizing on disturbances and the proposed project does include grading and disturbing approximately 150 acres, the proposed project would include multiple ECs, as described under Nonnative Plant Control in Table 1 of Appendix B, <i>Tule Red Tidal Restoration Environmental Commitments and Mitigation Measures</i>, of this document, to avoid introducing invasive nonnative species and substantially improving conditions for invasive species. These environmental commitments are the same as Appendix F, <i>Mitigation Monitoring and Reporting Program</i>, of the SMP EIS/EIR, with the one exception of including the option of using a naturalized seed mix, instead of using certified weed-free native mixes for any restoration planting as provided in the revegetation plan developed in cooperation with CDFW. Furthermore, the velocities expected during the initial breach and as the project site reaches equilibrium are not velocities that would lead to tidal muting. Therefore, the breach is not expected to increase the spread of invasive plant species. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.</p>

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VEG-6: Loss of Special-Status Plants or Suitable Habitat as Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities, other than reference to “construction activities” and levee breaching.	Construction activities associated with tidal wetland restoration and scour adjacent to levee breaches could affect populations of soft bird’s beak, Suisun thistle, Mason’s lilaeopsis, delta tule pea, delta mudwort, and Suisun Marsh aster. Any potential impacts on suitable special-status plant species habitat from temporary tidal restoration actions would be more than offset by the range of marsh elevations and associated habitats that would be created and restored by the tidal restoration actions, resulting in more suitable habitat for all special-status plant species and contributing to the recovery of these species.	Breach size and location would be selected to minimize effects of scour on special-status species.  <b>Environmental Commitments:</b> <ul style="list-style-type: none"> <li>• <b>If initial screening by a qualified biologist identifies the potential for special-status plant species to be directly or indirectly affected by a site-specific project, the biologist will establish an adequate buffer area to exclude activities that would directly remove or alter the habitat of an identified special-status plant population or result in indirect adverse effects on the species’ habitat.</b></li> <li>• <b>General Best Management Practices</b></li> <li>• <b>Worker Training</b></li> <li>• <b>Special- Status Plant Species Protection</b></li> <li>• <b>Biological monitoring</b></li> </ul>	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. There are no known special-status plant species within the project site (Appendix E). In addition, the project site would be managed as a managed wetland prior to grading for restoration purposes. Managed wetland activities include mowing and other vegetation control measures that greatly reduce the likelihood of special-status plant species inhabiting the project site. Furthermore, the project site would be flooded prior to breaching (Phase 2) the existing natural berm, which would discourage special-status species from colonizing the project site. The proposed project would incorporate the ECs regarding special-status plants prior to construction with the exception of the sole use of handheld tools, the use of exclusion fencing, and the removal of woody vegetation by trimming vegetation to approximately 1 foot above ground level. The ECs, as described in Appendix B, would to verify the locations of special-status plants identified in previous surveys are extant, identify any new special-status plant occurrences, and cover any portions of the project area not previously identified. The extent of mitigation of direct loss of or indirect impacts on special-status plants would be based on these survey results. If found, the locations of special-status plants in proposed construction areas will be recorded using a global positioning system (GPS) unit and flagged. Any special-status plant species observed during surveys will be reported to the USFWS and CDFW so the observations can be added to the California Natural Diversity Database (CNDDDB). No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.	

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	VEG-7: Degradation of Native Plant Species and Spread of Invasive Plant Species as a Result of Increased Public Access	LS	None required	—	No description of specific restoration activities.	Increased public access could result in increased pedestrian traffic in the vicinity of sensitive habitat or special-status plant populations.	<b>Environmental Commitment:</b> <ul style="list-style-type: none"> <li>• Access may be restricted around restoration sites where necessary to protect special-status plant populations though appropriate management plans and the design of the tidal marsh restoration. This may include signage, buffers, seasonal restrictions, and design or no access, depending on the sensitive species in question.</li> <li>• Biological Resources Best Management Practices - General Best Management Practices</li> </ul>	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Similar to Impact VEG-6, there are no known special-status plant species within the project site. The project site would not be available to public access during the initial restoration of the project site (Phase I, Phase II, and immediately thereafter). In the future, the project site would be turned over to CDFW to manage; CDFW management plans would govern the ability of the public to access the site. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
	VEG-8: Loss or Degradation of Tidal Native Plant Species and Spread of Invasive Plant Species as a Result of Tidal Muting	LS	None required	—	<ul style="list-style-type: none"> <li>• Levee breaching</li> <li>• Lowering existing levees</li> </ul>	Tidal muting due to levee breaching could result in a temporary reduction in the tidal water surface elevation range.	Breach locations would be chosen to minimize temporary upstream tidal muting.	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. The northern breach location of the proposed project, which was selected to reduce impacts, helps to minimize temporary upstream tidal muting. As described in Impact FISH-3 and Impact WTR-2, the velocities expected during the initial breach and as the site reaches equilibrium are not velocities that would lead to tidal muting. The breach has been designed to ensure that tidal flows remain below 3 fps to prevent tidal muting or scouring. Therefore, the breach is not expected to cause degradation of existing tidal native plant species and the spread of invasive plant species. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.

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<p>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 by CDFW or USFWS.</p> <p>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 impeded the use of native wildlife nursery sites?</p>	<p>WILD-1: Loss or Disturbance of Salt Marsh Harvest Mouse Suitable Habitat as a Result of Tidal Wetland Restoration</p>	<p>LS</p>	<p>None required</p>	<p>—</p>	<p>No description of specific restoration activities, other than reference to “construction of habitat levees that include benches or berms.”</p>	<p>Conversion of habitat in managed wetlands to tidal wetlands would result in a temporary reduction in SMHM habitat. However, restored areas would be expected to provide permanent suitable and sustainable habitat. Habitat levees would provide habitat for the salt mouse harvest mouse as the remainder of the tidal wetland areas become established. Additionally, restoration activities would most likely be located throughout the marsh and implemented over the 30-year plan period rather than concentrated in a small geographic area or time frame.</p>	<p><b>Environmental Commitments:</b></p> <ul style="list-style-type: none"> <li>• Biological Resources Best Management Practices - General Best Management Practices</li> <li>• Worker Training</li> <li>• Special-Status Wildlife Species Protection (Mammals)—measures specific to SMHM</li> <li>• Biological Monitoring</li> </ul> <p>Project proponents of restoration can propose alternative measures for protecting sensitive species through project-level formal or informal consultations.</p> <p><u>Conservation Measures (CMs) of the USFWS Programmatic Biological Opinion</u></p> <ol style="list-style-type: none"> <li>1. A USFWS-approved biologist, with previous SMHM monitoring and surveying experience, will conduct preconstruction surveys for the mouse prior to project initiation. If an SMHM is discovered, construction activities will cease in the immediate vicinity of the individual until USFWS is contacted and the individual has been allowed to leave the construction area.</li> <li>2. Disturbance to wetland vegetation will be avoided to the extent feasible in order to reduce potential impacts on SMHM. If wetland plants cannot be avoided, it will be removed by hand (and/or by another USFWS- and CDFW-approved method). The USFWS-approved biologist will be on-site to monitor all wetland vegetation removal activities.</li> <li>3. The upper 6 inches of soil excavated within SMHM habitat will be stockpiled separately and replaced on top of the backfilled material.</li> <li>4. Vegetation will be removed using hand tools (and/or by another USFWS- and CDFW approved method).</li> <li>5. Vegetation must be cleared to bare ground.</li> <li>6. Vegetation should be removed from all areas (driving roads, action area, or anywhere else where vegetation could be stepped on).</li> </ol>	<p>The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. The proposed project would minimize SMHM habitat within the footprint of construction while preserving large undisturbed areas of vegetation for SMHM refuge. The proposed project would disturb only 150 acres within the project site, compared to the typical disturbance of 175 acres under managed wetland conditions. The management activities prior to flood-up include vegetation control through disking. This would greatly reduce the likelihood of harvest mouse habitat existing on the project site. Per the SMP EIS/EIR, project proponents have consulted with USFWS/CDFW to provide alternative measures for protecting SMHM, consistent with the intent of the measures identified in the USFWS Programmatic Biological Opinion. As such, the following would occur:</p> <ul style="list-style-type: none"> <li>• Approval of another vegetation removal method (i.e., equivalent measure) for CM2 and CM4 has been requested and would be implemented. This method would not include hand grubbing.</li> <li>• CM3 would not be implemented because it is not applicable, given the project site would undergo standard managed wetland activities that would involve disking.</li> <li>• CM7 would not be implemented because it is not applicable; work within the project site would be done prior to breaching. Thus, the project site would not experience extreme high tides.</li> <li>• Installation of temporary exclusion fencing (as identified under CMs 8 and 9) would not be required because of prior earthwork for the Tule Red Restoration Project; wetland vegetation would be removed using a method approved by USFWS, thereby eliminating</li> </ul>

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							<ol style="list-style-type: none"> <li>7. Work will be scheduled to avoid extreme high tides when there is potential for SMHM to move to higher, drier grounds. All equipment will be staged on existing roadways away from the project site when not in use.</li> <li>8. To prevent SMHM from moving through the project site during construction, temporary exclusion fencing will be placed around a defined work area before construction activities start and immediately after vegetation removal. The fence should be made of a material that does not allow SMHM to pass through or over, and the bottom should be buried to a depth of 2 inches so that mice cannot crawl under the fence. Any supports for the SMHM exclusion fencing must be placed on the inside of the project area.</li> <li>9. Prior to the start of daily construction activities during initial ground disturbance, the USFWS-approved biologist will inspect the SMHM-proof boundary fence to ensure that it has no holes or rips and the base is still buried. The fenced area also will be inspected to ensure that no mice are trapped in it. Any mice found along and outside the fence will be closely monitored until they move away from the construction area.</li> <li>10. If an SMHM is discovered, construction activities will cease in the immediate vicinity of the individual until USFWS is contacted and the individual has been allowed to leave the construction area.</li> <li>11. A USFWS-approved biologist with previous SMHM experience will be on-site during construction activities occurring in wetlands. The biologist will document compliance with the project permit conditions and avoidance and conservation measures. The USFWS-approved biologist has the authority to stop project activities if any of the requirements associated with these measures is not being fulfilled. If the USFWS-approved biologist has requested work stoppage because of take of any of the listed species, USFWS and CDFW will be notified within 1 day by email or telephone.</li> </ol>	<p>SMHM refugia and the need for exclusion fencing prior to earthwork. Following vegetation removal, the area would be flooded to prevent reestablishment of vegetation.</p> <p>No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.</p>

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WILD-2: Loss or Disturbance of California Clapper Rail Suitable Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities.	<p>Figure 15 of the SMP EIS/EIR identifies levees affected by California clapper rail restrictions. Restoration activities in tidal wetlands and tidal sloughs in Suisun Marsh could disrupt clapper rail breeding and foraging habitat. There could be a minor, temporary loss of foraging habitat as a result of construction-related activities throughout the marsh. Increased scour and tidal muting that could occur as a result of restoration could result in the temporary loss of California clapper rail foraging habitat.</p> <p>Conversion of managed wetlands to tidal wetlands would result in increased clapper rail breeding and foraging habitat. It is expected that suitable adjacent areas would continue to provide habitat for clapper between breaching the levee and the establishment of a fully functioning tidal wetland. Additionally, restoration activities would most likely be located throughout the marsh and implemented over the 30-year plan period rather than concentrated in a small geographic area or time frame.</p>	<p><b>Project Design Features:</b></p> <ul style="list-style-type: none"> <li>Breach sites and other restoration features would be designed to avoid sensitive habitats to the extent possible.</li> </ul> <p><b>Environmental Commitments: Protection of Special Status Species - Birds and California clapper rail, including:</b></p> <ul style="list-style-type: none"> <li>Construction activity, including vegetation clearing, would be limited to months outside the breeding season.</li> <li>If construction activities are necessary during the breeding season, preconstruction surveys of suitable nesting habitat in and adjacent to the construction areas would be performed to identify the general location of clapper rail nest sites in the project area. Nesting habitat areas will be flagged for avoidance if construction activities would occur during the nesting season. Disturbance in these areas will be avoided until after the nesting season.</li> <li>Staging areas would be sited at least 100 feet from water bodies.</li> </ul>	<p>The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Appendix E of this document summarizes known information about California clapper rail presence on the Tule Red project site. The project site is located in Region 4 of Suisun Marsh and outside of the SMP EIS/EIR Figure 15 California clapper rail restrictions. Clapper rails are historically restricted to the western regions of the marsh, which are more saline and provide higher tidal wetland zones. Since 2010, the project site has been actively managed. There have been no direct tidal circulations and no network of tidal sloughs (characteristics needed to support clapper rails). In addition, during that time, there have been no observations of clapper rails. Given this, there is a very low likelihood of California clapper rail presence on the project site. However, as identified by the SMP EIS/EIR and Appendix B of this document, if construction activities are necessary during the breeding season, preconstruction surveys for California clapper rail will be conducted by a USFWS-approved biologist at and adjacent to areas of potential tidal and managed wetlands habitat for California clapper rail. The surveys will focus on potential habitat that may be disturbed by construction activities during the breeding season to ensure that these species are not nesting in these locations. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.</p>	

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	WILD-3: Loss or Disturbance of California Black Rail Suitable Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities	Construction-related activities, the inundation of suitable habitat in managed wetlands, and the impacts of increased scour and tidal muting could result in the temporary loss of black rail breeding and foraging habitat. Additionally, restoration activities would most likely be located throughout the marsh and implemented over the 30-year plan period rather than concentrated in a small geographic area or time frame.	Same ECs as listed for clapper rail in Impact WILD-2.	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Similar to Impact WILD-2, Appendix E of this document summarizes known information about California black rail presence on the project site. However, as identified by the SMP EIS/EIR and Appendix B of this document, if construction activities are necessary during the breeding season, preconstruction surveys for California black rail will be conducted by a USFWS-approved biologist at and adjacent to areas of potential tidal and managed wetlands habitat for California black rail. The surveys will focus on potential habitat that may be disturbed by construction activities during the breeding season to ensure that these species are not nesting in these locations. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
	WILD-4: Loss or Disturbance of Suisun Shrew Suitable Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities, other than reference to “construction of habitat levees that include benches or berms.”	Construction-related activities, the inundation of suitable habitat in managed marshes, and the impacts of increased scour and tidal muting could result in the temporary loss of Suisun shrew breeding and foraging habitats. As the restored area evolves into a functioning vegetated tidal wetland, it is expected to provide permanent suitable and sustainable habitat for Suisun shrew. Habitat levees would provide opportunities for the establishment of high marsh/upland transition habitat. Temporary losses of suitable habitat would be offset by restoration of tidal wetlands.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. The proposed project would minimize Suisun shrew habitat within the footprint of construction while preserving large undisturbed areas of vegetation for Suisun shrew refuge. The proposed project would disturb only 150 acres within the project site, compared to the typical disturbance of 175 acres under managed wetland conditions. The management activities prior to flood-up include vegetation control through disking. This would greatly reduce the likelihood of Suisun shrew breeding and foraging habitats to exist on the project site. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.



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WILD-5: Loss or Disturbance of California Least Tern Suitable Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities.	Breeding season impacts will be avoided and temporary losses of suitable habitat offset by the restoration of tidal wetlands.	<p><b>Environmental Commitments: Protection of Special Status Species - Birds and Least terns, including</b></p> <ul style="list-style-type: none"> <li>• No activities will be performed within 300 feet of an active least tern nest during the least tern breeding season, April 15 to August 15 (or as determined through surveys).</li> </ul>	<p>The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Similar to Impact WILD-2, Appendix E contains information about the known presence of the California least turn on the project site. Least turns are typically nest in shallow scrapes in sand or fine substrate gravel with sparse vegetation near open water. There are no sandy areas or areas with fine gravel substrate on the project site, and the active management of the site would discourage least turn from using it. However, as identified by the SMP EIS/EIR and Appendix B of this document, no activities will be performed within 300 feet of an active least tern nest during the least tern breeding season, April 15 to August 15 (or as determined through surveys). No additional ECs or MMs are needed for Tule Red.</p>	
WILD-6: Loss of Suisun Song Sparrow and Salt Marsh Common Yellowthroat Suitable Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities.	<p>Restoration activities in tidal and managed wetlands could disrupt breeding habitat and foraging habitat in tidal wetlands.</p> <p>Breeding season impacts will be avoided and temporary losses of suitable habitat offset by the restoration of tidal wetlands.</p>	<p><b>Environmental Commitments: Protection of Special Status Species – Birds, including:</b></p> <ul style="list-style-type: none"> <li>• Preconstruction surveys to identify nest sites.</li> <li>• Construction-related activities would be limited to months outside of breeding season in the vicinity of active nests.</li> <li>• Sensitive resources, such as nests, would be flagged and avoided.</li> </ul>	<p>The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. The Tule Red project will incorporate all the ECs noted here and as described Appendix F, <i>Mitigation Monitoring and Reporting Program</i>, and Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i>, of the SMP EIS/EIR. No additional ECs or MMs are needed for Tule Red.</p>	

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	WILD-7: Loss or Disturbance of Raptor Nest Sites or Foraging Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities.	A temporary reduction in foraging habitat could occur for those species that forage in managed wetlands. However, restoration activities would most likely be located throughout the marsh and implemented over the 30-year plan period rather than concentrated in a small geographic area or time frame. It is expected that suitable adjacent areas would continue to provide habitat for raptors between breaching the levee and the establishment of a fully functioning tidal wetland. Breeding season impacts will be avoided and temporary losses of suitable habitat offset by the restoration of tidal wetlands.	<p><b>Environmental Commitments: Protection of Special Status Species - Birds and Raptors, including:</b></p> <ul style="list-style-type: none"> <li>• <b>Preconstruction surveys to identify nest sites.</b></li> <li>• <b>Construction-related activities would be limited to months outside of breeding season in the vicinity of active nests.</b></li> <li>• <b>All woody and herbaceous vegetation would be removed from the construction areas during the nonbreeding season (September 1–February 1) to minimize effects on nesting birds.</b></li> <li>• <b>Any sensitive resources, such as nests, would be flagged and avoided.</b></li> </ul>	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. Conditions on the project site are such that raptors are highly unlikely to use the site for nesting (i.e., no trees). However, some raptors, such as the short-eared owl and the northern harrier, are ground nesters. Therefore, the Tule Red project will incorporate all the ECs noted here and as described in Appendix F, <i>Mitigation Monitoring and Reporting Program</i> , and Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i> , of the SMP EIS/EIR. No additional ECs or MMs are needed for Tule Red.
	WILD-8: Loss or Disturbance of Western Pond Turtle as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities.	The conversion of suitable habitat in managed wetlands to tidal wetlands would result in the permanent or temporary loss of breeding habitat for western pond turtles. Most impacts on pond turtles will be avoided and permanent or temporary loss of suitable habitat offset by the restoration of tidal wetlands and enhancement of managed wetlands	<p><b>Environmental Commitments: Western Pond Turtle, including:</b></p> <ul style="list-style-type: none"> <li>• <b>Preconstruction surveys will be performed in all managed wetlands and adjacent sloughs that provide suitable habitat. If pond turtles are identified, the area will be surveyed for nesting sites if construction activities would occur during the nesting season.</b></li> <li>• <b>If pond turtles are identified in managed wetlands to be breached, the ponds and associated drainages will be dewatered, and to the extent feasible, any turtles observed will be captured and released to other suitable locations within a nearby managed wetland or drainage.</b></li> <li>• <b>Breaching of levees in occupied breeding habitat would occur outside of the breeding months of April to July.</b></li> <li>• <b>Breach sites and other restoration features would be designed to avoid sensitive habitats to the extent possible.</b></li> </ul>	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. The Tule Red Restoration Project would incorporate all the ECs noted here and as described in Appendix F, <i>Mitigation Monitoring and Reporting Program</i> , and Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i> , of the SMP EIS/EIR. No additional ECs or MMs are needed for Tule Red.

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	WILD-9: Loss or Disturbance of Tricolored Blackbird as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities.	Conversion of suitable habitat in managed wetlands to tidal wetlands may result in a permanent or temporary reduction in suitable habitat. Impacts on tricolored blackbirds will be minimized and any loss of suitable habitat compensated for by the enhancement of managed wetlands.	<b>Environmental Commitments: Protection of Special Status Species – Birds, including:</b> <ul style="list-style-type: none"> <li>• Preconstruction surveys to identify nest sites in project area.</li> <li>• Construction activity in the vicinity of active nests would be limited to months outside the breeding season</li> <li>• Any sensitive resources, such as nesting colonies, would be flagged and avoided.</li> </ul>	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. The Tule Red Restoration Project would incorporate all the ECs noted here and as described in Appendix F, <i>Mitigation Monitoring and Reporting Program</i> , and Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i> , of the SMP EIS/EIR. No additional ECs or MMs are needed for Tule Red.
	WILD-10: Effects on Southern Resident Killer Whales as a Result of Changes in Salmon Populations	NI	None required	—	No description of specific restoration activities.	Restoration could have an effect on salmonid populations, which would indirectly affect southern resident killer whales. If Chinook salmon populations are negatively affected, a reduction in prey availability for the southern resident killer whales could occur. Reductions in prey availability may force the whales to travel longer distances to find prey or select lesser-quality prey, resulting in reduced reproductive rates and higher mortality. However, tidal wetland restoration is expected to increase rearing habitat for juvenile Chinook salmon in Suisun Marsh. Tidal wetlands are more productive and would allow better growth and survival of Chinook salmon. The portion of the killer whale prey base that comes from Suisun Marsh is small compared to Pacific Northwest and Central Valley streams.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red.

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	WILD-11: Loss or Disturbance of Waterfowl and Shorebird Habitat as a Result of Tidal Wetland Restoration	LS	None required	—	No description of specific restoration activities.	Enhancement activities would offset this loss by improving remaining managed wetlands and therefore improving habitats that support waterfowl and shorebirds. Most of the diving ducks in the marsh will benefit during the tidal marsh establishment period and will continue to use deeper areas of wetlands and channels as the tidal wetlands become established. Additionally, as tidal wetlands are established, shorebirds are expected to benefit as a result of more natural habitat developed through restoration activities	<b>Environmental Commitments: Special Status Species – Birds, including:</b> <ul style="list-style-type: none"> <li>• <b>Preconstruction surveys would be performed to identify nest sites in the project area</b></li> <li>• <b>Construction activity in the vicinity of active nests would be limited to months outside the breeding season.</b></li> <li>• <b>Any sensitive resources, such as nests, would be flagged and avoided.</b></li> </ul>	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. The Tule Red Restoration Project would incorporate all the ECs noted here and as described in Appendix F, <i>Mitigation Monitoring and Reporting Program</i> , and Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i> , of the SMP EIS/EIR. No additional ECs or MMs are needed for Tule Red.
e.) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LU-3	See LU-3, below.	See LU-3, below.	See LU-3, below.	Impact LU-3 under Land Use Appendix G addresses these two thresholds.	See Impact LU-3.	See Impact LU-3.	See Impact LU-3.
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.								

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<b>GREENHOUSE GASES (CLIMATE CHANGE) <sup>1</sup></b>								
a.) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	CC-1: Construction-Related Changes in Greenhouse Gas Emissions	LS	None required	—	Construction activities related to both tidal restoration <u>and</u> managed wetland activities.	Construction activities would result in temporary increased emissions over the 30-year implementation period. These activities would occur intermittently over time, and generation of substantial GHG emissions is not expected during construction. Approximately 276.3 tons of CO <sub>2</sub> per year would be generated from restoration activities alone. Construction emissions would most likely be offset though changes in net GHG sources and sinks.	No information incorporated	The SMP EIS/EIR estimated that approximately 276.3 tons of CO <sub>2</sub> per year would be generated from restoration activities alone; however, this estimation was generated using the outdated URBEMIS emissions model. Based on emissions modeling using the current CalEEMod emissions model, which generally has higher GHG emission factors than the URBEMIS emissions model, CO <sub>2</sub> e MT/yr emissions generated by the proposed project are expected to range from 429 MT/yr to 517 MT/yr for Phase 1 Scenarios A through C and approximately 63 MT/yr for Phase 2. As identified in the SMP EIS/EIR, construction emissions would be offset though changes in net GHG sources and sinks because the Tule Red project site is a tidal restoration habitat project and would become a sink for CO <sub>2</sub> . In addition, the CO <sub>2</sub> emissions currently generated every year under the managed wetland activities would no longer occur (estimated with URBEMIS at 322 MT/yr), further reducing CO <sub>2</sub> e emissions associated with the proposed project. No additional ECs or MMs are needed for Tule Red. Impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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<p>a.) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment</p> <p>b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of a greenhouse gas.</p>	<p>CC-2: Permanent Changes in Greenhouse Gas Sources and Sinks</p>	<p>Beneficial</p>	<p>None required</p>	<p>—</p>	<p>Construction activities related to both tidal restoration <u>and</u> managed wetland activities.</p>	<ul style="list-style-type: none"> <li>• Improved recreational access may result in a slight increase in the number of users and the associated vehicle use, but it is not expected that this increase would result in a substantial increase in permanent or short-term GHG emissions.</li> <li>• Implementation of the proposed project could increase or decrease net GHG emissions related to the Suisun wetlands, depending on the specific location of the restored wetlands (i.e., west versus east).                             <ul style="list-style-type: none"> <li>○ Carbon benefits from sequestration in a brackish wetland may exceed emissions from methane production. As such, implementation of the plan alternatives in the western portion of the Suisun wetlands could result in a net decrease in GHG emissions</li> <li>○ Carbon benefits from sequestration in a freshwater wetland may be overwhelmed by methane production. Thus, implementation of the plan alternatives in the eastern portion of the Suisun wetlands could result in a net increase in GHG emissions.</li> </ul> </li> <li>• Implementation of SMP alternatives could result in a large reduction in CO<sub>2</sub> emissions if peat soil oxidation is taken into account.</li> <li>• One-time construction emissions (all construction activities under SMP) would be offset within approximately 6 to 9 years.</li> </ul>	<p>No information incorporated</p>	<p>Same as Impact CC-1. No additional ECs or MMs are needed for Tule Red. Impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>

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None.	CC-3: Degradation of Wetland Habitat and Ecosystem Health as a Result of Inundation Associated With Sea Level Rise	—	—	—	No description of specific restoration activities.	<ul style="list-style-type: none"> <li>Restoration of wetland function would decrease the risk of shoreline flooding in the Suisun Bay area.</li> </ul> <p>Suisun Marsh habitat/ecosystem health would not be adversely affected by climate change-induced sea level rise within the 30-year planning horizon because:</p> <ul style="list-style-type: none"> <li>Although the marsh is susceptible to inundation due to 100-year storm events, because of the proposed levee improvements and the ability of the tidally restored wetlands to accrete sediment and eventually support vegetated tidal marsh, the marsh would most likely not become consistently inundated.</li> <li>Gradually sloping wetland/upland transition zone surfaces would provide an elevation gradient over which tidal wetland could shift upslope when floodwaters rise.</li> </ul> <p>Beyond 30-year planning horizon, sea level rise associated with climate change could overwhelm levees and result in marsh inundation. Marsh inundation would result in erosion/loss of wetland habitat, altered species composition, changing freshwater inflow and salinity, an altered foodweb, and impaired water quality.</p>	<p>Assumptions:</p> <ul style="list-style-type: none"> <li>For at least 30 years, the improved levees would hold under the water force associated with predicted sea level rise.</li> <li>Restoration impacts were not analyzed separately from managed wetland activities; rather, it was just an analysis on all “construction activities.”</li> </ul>	<p>Similar to the SMP EIS/EIR impact analysis, the proposed project is expected to regularly accrete sediment on the existing natural exterior berm (as it has been doing for several decades), which would reduce the likelihood of continual inundation associated with sea level rise (see Table 5.1 in Appendix D.2). Grizzly Bay has a high suspended sediment load; the adjacency of the project site and the direct connection to the bay are ideal for accommodating sea level rise. The existing elevations of the managed marsh (between 3 and 5.5 feet NAVD88) are ideal for capturing sediment deposited from the adjacent Grizzly Bay once the channels and breach to the bay have opened the site up to tidal influence. Sediment deposition at the edge of the bay has led to advancement of the shoreline at a current rate of 6 to 10 feet per year; modeling by NHC indicates sediment will deposit on the marsh plain at rates that exceed sea level rise (Appendix D.2). In addition, the gradually sloping wetland upland transition zone along the habitat berm would provide an elevation gradient over which tidal wetlands could shift upslope when floodwaters rise. The stability of the habitat levee should minimize future management requirements, even with elevated sea levels. No additional ECs or MMs are needed for Tule Red. Impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>

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<b>CULTURAL RESOURCES (CULTURAL RESOURCES) <sup>1</sup></b>								
a.) Cause a substantial adverse change in the significance of a historical resource, as defined in Section 15064.5.	CUL-1: Damage to Montezuma Slough Rural Historic Landscape and Mein's Landing as a Result of	S	<u>CUL-MM-1: Document and Evaluate the Montezuma Slough Rural Historic Landscape, Assess Impacts, and Implement Mitigation Measures to Lessen Impacts</u>	SU	<ul style="list-style-type: none"> <li>• Maintenance of levee and water control features</li> <li>• Levee lowering or breaching</li> <li>• Upgrading or constructing new exterior levees adjacent to restoration areas</li> <li>• Inundation of restoration areas</li> </ul>	Ground-disturbing activities such as levee modifications, conversion of managed wetlands and uplands to managed wetlands, replacement of infrastructure, and enhancement of vernal pool and riparian habitat may result in damage to character-defining features of the Montezuma Slough Rural Historic Landscape.	In subsequent project-level evaluation, if a state or federal lead agency finds in inventory that the Montezuma Slough Rural Historic Landscape does not constitute a historic property or historical resource, implementation of the mitigation measure would reduce the severity of the impact to less than significant.	The site is not located within proximity to Montezuma Slough Rural Historic Landscape or Mein's Landing. Therefore, CUL-MM-1 identified in the SMP EIS/EIR is not applicable to Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
b.) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Ground-Disturbing Activities along Montezuma Slough							



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<p>a.) Cause a substantial adverse change in the significance of a historical resource, as defined in Section 15064.5.</p> <p>b.) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.</p> <p>c.) Directly or indirectly destroy a unique paleontological resource site or unique geologic feature.</p>	<p>CUL-2: Damage to or Destruction of Other Known Cultural Resources as a Result of Ground-Disturbing Activities in Lowland and Marsh Areas</p>	S	<p><u>CUL-MM-2: Evaluate Previously Recorded Cultural Resources and Fence NRHP- and CRHR- Eligible Resources prior to Ground-Disturbing Activities</u></p>	LS	<ul style="list-style-type: none"> <li>• Maintenance of levee and water control features</li> <li>• Levee lowering or breaching</li> <li>• Upgrading or constructing new exterior levees adjacent to restoration areas</li> <li>• Inundation of restoration areas</li> </ul>	<p>Twenty-four previously recorded cultural resources are located in lowland and marsh areas within the marsh and therefore could be affected by tidal marsh restoration in those areas. The resources are considered historic properties and historical resources. However, the majority of these resources are recommended as ineligible for the NRHP/CRHR based on not meeting significance criteria (Reclamation 2011, Table 7.7-10).</p>	<p>No information incorporated</p>	<p>Of the 24 resources identified in the SMP EIS/EIR, 13 are in Region 4 of the marsh (where the project site is) (Reclamation 2011, Table 7.7-10). All but two are recommended as ineligible (NRHP/CRHR) based on not meeting state and federal cultural significance criteria. The remaining two are identified as undetermined but are not near the project site (a lowland grassland area and the Montezuma wetlands flume structure) (Reclamation 2011, Table 7.7-10). As described in Appendix H, <i>Cultural Resources Report</i>, the cultural resources evaluation of the Tule Red project site indicates no known significant cultural (historic or archaeological) resources are located within the site. In addition, there is very low potential for unknown significant cultural (historic or archaeological) resources to exist because the project site was underwater until approximately the mid-1950s and heavy sedimentation has buried older surfaces to a considerable depth. The sedimentation is based on the continual accretion of sediment to the site from Grizzly Bay. Impacts would be less than significant. However, the Tule Red project would incorporate the following ECs:  <i>Prior to ground-disturbing activities in restoration areas, SFCWA will conduct a cultural resources inventory of the restoration area according to the standards (a) through (e) cited in CUL-MM-1 of Section 7.7 of the SMP EIS/EIR). If any cultural resources are determined to be historic properties and ground-disturbing activities are found to result in adverse effects, the Corps or SFCWA will resolve the effects in accordance with Section 106 of the NHPA or CEQA, as applicable.</i>  <i>If no cultural resources are identified in specific restoration areas, or identified resources are not determined to be significant, no additional cultural work will be required.</i></p>

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CUL-3: Damage to Known Cultural Resources as a Result of Inundation	S	<u>CUL-MM-3: Protect Known Cultural Resources from Damage Incurred by Inundation through Plan Design (Avoidance)</u>	SU	<ul style="list-style-type: none"> <li>• Maintenance of levee and water control features</li> <li>• Levee lowering or breaching</li> <li>• Upgrading or constructing new exterior levees adjacent to restoration areas</li> <li>• Inundation of restoration areas</li> </ul>	Twenty-four previously recorded cultural resources are located in lowland and marsh areas in the marsh and therefore could be affected by inundation of such areas. Inundation would degrade character-defining elements of cultural resources, such as historic buildings and structures as well as archaeological sites. Prolonged and repeated inundation would lead to structural degradation (oxidation and weakening of metals) and the decay of archaeological site constituents.	No information incorporated	Same as Impact CUL-2.	
		<u>CUL-MM-4: Resolve Adverse Effects prior to Construction</u>						

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a.), b.), and c.), identified above	CUL-4: Inadvertent Damage to or Destruction of As-Yet-Unidentified Cultural Resources as a Result of Ground-Disturbing Activities in Restoration Areas	S	<u>CUL-MM-5: Conduct Cultural Resource Inventories and Evaluate and Resolve Any Adverse Effects</u>	SU	<ul style="list-style-type: none"> <li>Maintenance of levee and water control features</li> <li>Levee lowering or breaching</li> <li>Upgrading or constructing new exterior levees adjacent to restoration areas</li> <li>Inundation of restoration areas</li> </ul>	Construction in unsurveyed areas would most likely result in damage to or destruction of unknown cultural resources that may meet the criteria of a historic property, historical resource, or unique archaeological resource. Region 1 possesses the highest percentage of restoration activities occurring within areas sensitive for the presence of buried archaeological resources (34.8%), even considering that a larger proportion of Region 3 would see restoration activities than would Region 1. Region 2 has the lowest percentage (2.1) of areas sensitive for buried archaeological resources. The likelihood of restoration activities being situated in areas sensitive for the presence of surface-manifested prehistoric resources is highest in Region 3 (30.4%) and lowest in Region 4 (8.0%).	<b>Environmental Commitment: Inadvertent Discovery of Unknown Cultural Resources.</b>	The Tule Red project is located in Region 4, a region that, according to the SMP EIS/EIR, has the lowest likelihood of restoration activities being situated in areas sensitive for the presence of surface-manifested prehistoric resources. The cultural resources report (as described in Impact CUL-2) confirmed this low probability. Therefore, the MMs identified in the SMP EIS/EIR are not applicable to Tule Red. However, the Tule Red project would incorporate the following EC, which is similar to the Inadvertent Discovery of Unknown Cultural Resources EC in the SMP EIS/EIR, with the inclusion of the bolded text for conditions specific to the proposed project: <i>If any previously unknown historic or archeological artifacts are discovered while accomplishing the authorized work, the landowner must stop work <b>within 100 feet of the find immediately and notify the SFCWA and the Corps. All construction personnel will leave the area. Vehicles and equipment will be left in place until a qualified archaeologist identifies a safe path out of the area. The on-site supervisor will flag or otherwise mark the location of the find and keep all traffic away from the resource. The on-site supervisor will immediately notify the lead state or federal agency of the find.</b> The activity is not authorized until the requirements of Section 106 of the NHPA have been satisfied.</i> Impacts would be less than significant.
d.) Disturb any human remains, including those interred outside of formal cemeteries.	CUL-5: Damage to or Destruction of Human Remains as a Result of Ground-Disturbing Activities	LS	None required	—	<ul style="list-style-type: none"> <li>Maintenance of levee and water control features</li> <li>Levee lowering or breaching</li> <li>Upgrading or constructing new exterior levees adjacent to restoration areas</li> <li>Inundation of restoration areas</li> </ul>	Tidal marsh restoration, creation, and protection; conversion of managed wetlands and uplands; vernal pool habitat enhancement; riparian habitat enhancement (passive flooding, setback and perimeter levee building); and levee management have the potential to damage or destroy human remains during ground-disturbing activities.	<b>Environmental Commitment: Inadvertent Discovery of Cultural Resources</b>	As described in Appendix H, a cultural resources evaluation of the Tule Red project site indicates that no significant cultural resources were identified. In addition, there are no known significant historical or archaeological resources within the project area. Therefore, the potential for the inadvertent discovery of unknown cultural resources is low,

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<b>GEOLOGY AND SOILS AND MINERAL RESOURCES (GEOLOGY AND LEVEE STABILITY)<sup>1</sup></b>								
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.	GEO-1: Potential to Create Unstable Cut or Fill Slopes	LS	None required	—	<ul style="list-style-type: none"> <li>Grading to create habitat features</li> <li>Excavation of levee portions to inundate restoration area</li> <li>Placement of fill to improve interior and exterior levees and create islands or other upland transition areas</li> <li>Placement of riprap and other bank protection</li> </ul>	Project activities are not expected to create unstable cut or fill slopes and would most likely benefit slopes in both newly created tidal and existing managed wetlands.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
Geology and Soils b.) Result in substantial soil erosion or the loss of topsoil.	GEO-2: Potential for Accelerated Soil Erosion	LS or B	None required	—	<p>Ground-disturbing activities such as:</p> <ul style="list-style-type: none"> <li>Earthwork to breach levees</li> <li>Fill placement to expand and maintain the levees that are not removed</li> </ul>	<p>Ground-disturbing activities would have the potential to increase the rate and extent of soil erosion.</p> <p>Restoring tidal action to portions of Suisun Marsh would increase the mobility of sediment in reconnected tidal channels and mudflat areas. This would entail some scour and localized sediment deposition, but the cycle of tidally driven sediment erosion, transport, and redeposition would reflect the restoration of natural processes interrupted by the existing levee and dike system, which would be beneficial.</p>	<p>Per Chapter 2 of the SMP EIS/EIR, the description of restoration site activities, restoration sites will be managed to establish vegetation before breaching.</p> <p><b><u>Environmental Commitment:</u></b></p> <ul style="list-style-type: none"> <li><b>Standard Design Features and Construction Practices</b></li> <li><b>SWPPP</b></li> <li><b>Erosion and Sediment Control Plan</b></li> </ul>	Through a process of refined breach location selection, the Tule Red project decided a breach located in the northern part of the existing exterior natural berm would result in the fewest scour and hydrologic changes (Appendix D.2). Previously, removing both the existing tide gates without a breach had been considered, but this would most likely result in severely muted tidal cycle, erosion of the existing berm protecting the Grizzly Island Wildlife Area and the neighboring duck club, and hydraulic impacts on neighboring properties that drain/flood from the tidal channels connected to the project site (i.e., dampening of flood/drain levels). The Tule Red Restoration Project will incorporate the ECs noted here and as described in Appendix F, <i>Mitigation Monitoring and Reporting Program</i> , and Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i> , of the SMP EIS/EIR. Although the SWPPP would include an HMMP, implementation of the HMMP would not be necessary to prevent the loss of topsoil or substantial soil erosion. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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Geology and Soils b.) Result in substantial soil erosion or the loss of topsoil.	GEO-3: Potential Loss of Topsoil Resources	LS	None required	—	Ground-disturbing activities such as: <ul style="list-style-type: none"> <li>• Earthwork to breach levees</li> <li>• Fill placement to expand and maintain the levees that are not removed</li> </ul>	Construction of new project facilities would require removal of the existing topsoil layer Other ground-disturbing activities—such as earthwork to breach levees and fill placement to expand and maintain the levees that are not removed—also would have some potential to result in removal and loss of topsoil resources where they are present.	<b>Environmental Commitments:</b> <ul style="list-style-type: none"> <li>• Standard Design Features and Construction Practices</li> <li>• SWPPP</li> <li>• Erosion and Sediment Control Plan</li> </ul>	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
Mineral Resources 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.  Mineral Resources b.) Result in the loss of availability of a known locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.	GEO-4: Reduction in Availability of Non-Fuel Mineral Resources	LS	None required	—	No description of specific restoration activities.	Known mineral resources are not within the project area and are located only in limited areas on the periphery, it is not expected that restoration would result in changes in land uses related to mineral extraction.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
Mineral Resources 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.	GEO-5: Reduction in Availability of Natural Gas Resources	LS	None required	—	No description of specific restoration activities.	To the extent that restored marsh habitat is viewed as incompatible with natural gas extraction, the proposed action could render natural gas extraction less feasible in the future.	Per Chapter 2 of the SMP EIS/EIR, the description of restoration site activities, restoration activities would occur only on lands purchased from willing sellers, and natural gas still would be extracted in other areas in and around the marsh.	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.

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<p>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.</p>	<p>FC-3: Temporary Decrease in Levee Stability Resulting from Construction Activities</p>	<p>LS</p>	<p>None required</p>	<p>—</p>	<ul style="list-style-type: none"> <li>• Construction of new levee sections</li> <li>• Rehabilitation of levees</li> </ul>	<p>During construction of new levee sections or rehabilitation of levees to bring them up to a minimum standard, the levee may be subject to ground shaking and increased ground pressures from heavy equipment or placement of fill. This additional loading may exceed the potential for the existing levee material or levee foundation material to support the levee section (i.e., shear strength) and cause rapid settling or fracture of the levee section.</p>	<p><b><u>Environmental Commitment: Standard Design Features and Construction Practices, including: control construction equipment access and the placement of fill to maintain acceptable loading, based on the shear strength of the foundation material.</u></b></p>	<p>The Tule Red Restoration Project would incorporate the EC noted here and as described in Appendix F, <i>Mitigation Monitoring and Reporting Program</i>, and Chapter 2, <i>Habitat Management, Preservation, and Restoration Plan</i>, of the SMP EIS/EIR. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>
<p>d) Be located on expansive soil, as defined in Table 18-1 B of the Uniform Building Code (1994), Creating a Substantial Risk to Life or Property.</p>								
<p>a.) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:</p> <p>i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo earthquake fault zoning map issued by the State Geologist</p> <p>ii. Strong seismic ground shaking</p> <p>iii. Seismically related ground failure, including liquefaction</p> <p>iv. Landslides</p>	<p>None</p>	<p>—</p>	<p>—</p>	<p>—</p>	<p>None.</p>	<p>The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities in the SMP would not involve building structures and would not involve bringing people to an area of potential geologic or seismic risk, beyond those who already use the area for recreation. Construction workers who restore specific restoration sites would be on-site for a relatively short time when compared to geologic events and times. In other words, the probability of construction workers experiencing a geologic or seismic event resulting in an impact would be extremely low given the relatively infrequent occurrence of large seismic events over time and the fact that construction associated with restoration activities would be very short (i.e., less than 2 years).</p>	<p>None.</p>	<p>The Tule Red project would not involve the construction or operation of buildings and would not bring a substantial number of people to Suisun Marsh; therefore, the Tule Red project has no ability to expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death associated with geologic activities. Impacts would not occur.</p>

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e.) Have soil incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities in the SMP would not need septic tanks or alternative wastewater disposal systems. Construction contractors would be expected to provide adequate facilities for workers on a restoration site; however, these would not be permanent facilities and would be removed once construction is completed.	None.	The Tule Red project does not involve the construction or operation of septic tanks; therefore, it would not result in impacts on soils that would be incapable of supporting septic tanks. Impacts would not occur.



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<b>HAZARDS AND HAZARDOUS MATERIALS (PUBLIC HEALTH, ENVIRONMENTAL HAZARDS, AND TRANSPORTATION) <sup>1</sup></b>								
None.	HAZ-1: Increased Risk of Mosquito-Borne Diseases	LS	None required	—	No description of specific restoration activities.	Tidal restoration projects in Suisun Marsh generally have the potential for producing large numbers of mosquitoes.	<b>Environmental Commitment: Mosquito abatement best management practices.</b>	Under the proposed project, there would be several areas within the project site for retaining tidal water to increase food production. Specifically the project is to provide adequate residence times for cultivating and rearing zooplankton. The project site marsh plain (the largest part of the site) is designed below mean high water and above mean seal level, which means it will be flooded and drained on each high-tide cycle, limiting the potential for standing water, which is favored by mosquitos. A tidal pond is also part of the project, and modeled results indicate a residence time between 6 and 14 days (Appendix D.1), with depths between 2 and 7 feet. For breeding, mosquitos typically prefer shallow (less than 6 inches deep), stagnant water, and thick vegetation, including floating submerged plants (Walton 2004). The Tule Red Restoration Project will incorporate the EC noted here and as described in Appendix F and Chapter 2 of the SMP EIS/EIR, with the following exception: <i>"If necessary, <b>implement a sampling and treatment program</b> <del>obtain an engineering survey to locate</del> for any depressions that would retain tidal water <del>and design site restoration to promote water drainage.</del>"</i> Given the expected conditions under tidal restoration and the implementation of the EC, even with the change, the impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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<p>a.) Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials.</p> <p>b.) Create a significant hazard to the public or environment through the reasonably foreseeable upset and accidental conditions involving the release of hazardous materials into the environment.</p> <p>d.) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.</p>	HAZ-2: Exposure to or Release of Hazardous Materials during Construction	LS	None required	—	No description of specific restoration activities.	<p>Fuel and lubricant fluids associated with construction equipment could expose construction workers and the environment to hazardous materials if materials are improperly handled. Digging could affect underground gas pipelines. If pipelines are damaged during digging, a release of natural gas or other materials could expose construction workers and the environment to hazardous materials.</p>	<p><u>Project design features:</u> Avoid affecting existing pipelines and other facilities.</p> <p><u>Environmental Commitments:</u></p> <ul style="list-style-type: none"> <li>• Standard design features and construction practices</li> <li>• Access points/staging areas</li> <li>• HMMP</li> <li>• SWPPP</li> </ul>	<p>A Phase I Study of the project site, completed in 2011, including site reconnaissance and records review, did not find documentation or physical evidence of soil or groundwater impairments on the project site, and the title report did not document existing pipelines within the project site (Erikson pers. comm.; First American Title Insurance Company [unknown date]). Tule Red would incorporate the ECs noted here and as described in Appendix F and Chapter 2 of the SMP EIS/EIR, with the following exceptions:</p> <ul style="list-style-type: none"> <li>• For a component<sup>11</sup> of the Access Point/Staging Areas EC, staging areas will be identified in construction drawings.</li> <li>• For a component of the Standard Design Features and Construction Practices EC, the following revision will be made: <ul style="list-style-type: none"> <li>○ <i>“Minimizing degradation of wetland habitats where feasible by minimizing the disturbance footprint, i.e., work will be conducted from levee crown.”</i></li> </ul> </li> <li>• An HMMP would be included in the SWPPP; the HMMP would not include implementation a risk management plan, which, as the SMP EIS/EIR indicates, is for large-scale projects.</li> </ul> <p>The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>

<sup>11</sup> “Staging areas will have a stabilized entrance and exit and will be located at least 100 feet from bodies of water unless site-specific circumstances do not provide such a setback, in which case the maximum setback possible will be used. If an off-road site is chosen, qualified biological and cultural resources personnel will survey the selected site to verify that no sensitive resources are disturbed by staging activities. If sensitive resources are found, an appropriate buffer zone will be staked and flagged to avoid impacts. If impacts on sensitive resources cannot be avoided, the site will not be used. An alternate site will be selected.”

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HAZ-3: Release of Hazardous Materials into Surrounding Water Bodies during Construction	LS	None required	—	<ul style="list-style-type: none"> <li>Levee breaching</li> </ul>	<p>Levee breaching in the area of Montezuma Slough could flood the nearby isolated pond containing a leaking underground fuel tank (LUFT), causing water contamination.</p> <p>Because the SMP area has a history of agricultural use and may have areas of previously unknown contamination related to this use, project construction or maintenance activities could encounter unknown contamination.</p>	<p><u>Project design features:</u> Restoration design will avoid the LUFT area.</p> <p><u>Environmental Commitments:</u></p> <ul style="list-style-type: none"> <li>Standard Design Features and Construction Practices</li> <li>HMMP</li> </ul>	<p>The LUFT identified in the SMP EIS/EIR is approximately 3 miles north of the project site; therefore, levee breaching on the project site would not affect this LUFT. In addition, a Phase I study of the project site, completed in 2011, including site reconnaissance and records review, did not find documentation or physical evidence of soil or groundwater impairments on the project site (Erikson pers. comm.). Finally, the title report for the project site does not identify an existing hazardous materials, overhead power lines, or subsurface oil pipelines or natural gas lines on the project site (First American Title Insurance Company [unknown date]). The Tule Red project would incorporate the EC noted here and as described in the SMP EIS/EIR, Appendix F and Chapter 2, with the following exceptions:</p> <ul style="list-style-type: none"> <li>An HMMP would be included in the SWPPP; the HMMP would not include implementation a risk management plan, which, as the SMP EIS/EIR indicates, is for large-scale projects and projects dealing with acutely hazardous materials such as chlorine gas, ammonia gas, hydrogen chloride, flammable gases.</li> </ul> <p>The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>	

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<p>g.) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.</p> <p>Transportation/Traffic e.) Result in inadequate emergency access.</p>	<p>HAZ-4: In-Channel Construction-Related Increase in Emergency Response Times</p>	<p>LS</p>	<p>None required</p>	<p>—</p>	<ul style="list-style-type: none"> <li>In-channel work, including levee breaching</li> </ul>	<p>Construction equipment is not expected to impede emergency access provided by levee roads. Upon completion of construction, no changes in emergency access or response times would occur.</p>	<p><b>Environmental Commitment:</b></p> <ul style="list-style-type: none"> <li>Traffic and Navigation Control Plan and Emergency Access Plan</li> <li>Standard Design Features and Construction Practices</li> </ul>	<p>There would be no changes within Suisun Marsh channels due to implementation of the Tule Red project, and accordingly, there would be no impact on navigation. The existing exterior natural berm is not currently used for emergency access, and therefore, breaching would not impede emergency access. The existing levee, which would become the exterior levee, could be used for emergency access; however, it would remain as is (with a gravel road) and would not impede emergency access. Therefore, the SMP EIS/EIR EC would not be applicable. Impacts would be less than significant.</p>
<p>None.</p>	<p>HAZ-5: Increased Human and Environmental Exposure to Mercury</p>	<p>LS</p>	<p>None required</p>	<p>—</p>	<ul style="list-style-type: none"> <li>Levee breaching</li> </ul>	<p>Remobilization of sediments into the water column caused by restoration activities such as levee breaching can lead to temporary localized increases in suspended solids (SS) and DO. However, construction activities would be spread throughout the marsh and over the 30-year implementation period.</p>	<p>Per the conceptual model for the SMP, in cooperation with regional monitoring and research efforts, sediment and fish monitoring will be conducted at several restoration sites.</p>	<p>As discussed in Impact WQ-4, tidal habitat may reduce the potential conversion of mercury to methylmercury. As appropriate, monitoring would occur on the Tule Red restoration site to adaptively manage the site over time. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>
<p>e.) For a project located within an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing in or working in the project area.</p>	<p>TN-4: Impacts on Air Traffic Attributable to Restoration Activities</p>	<p>LS</p>	<p>None required</p>	<p>—</p>	<p>No description of specific restoration activities.</p>	<p>Compared to the existing tidal marsh and managed wetland acreage, the overall increase in acreage in these habitats would not significantly change wildlife or bird usage of the marsh.</p> <p>Restoration and managed wetland activities would occur far enough away from the airport that bird activity would not affect air traffic patterns.</p>	<p>No information incorporated</p>	<p>No ECs or MMs were identified in the SMP EIS/EIR impact analysis. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>
<p>f) For a project within the vicinity of a private air strip, result in a safety hazard for people residing or working in the project area.</p>								

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a.) Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials.	HAZ-7: Increased Human and Environmental Exposure to Natural Gas and Petroleum	S	<u>UTL-MM-2: Avoid Ground-Disturbing Activities within Pipeline Right-of-Way</u>	LS	No description of specific restoration activities.	Restoration would result in permanent tidal inundation, which would increase the potential for the environment and humans to be exposed to natural gas and petroleum because, should a leak occur, it would be more difficult to contain than it would be under existing conditions.	No information incorporated	Same as Impact HAZ-3. Impacts would be less than significant.
b. Create a significant hazard to the public or environment through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.			<u>UTL-MM-3: Relocate or Upgrade Utility Facilities that Could Be Damaged by Inundation</u>					
			<u>UTL-MM-4: Test and Repair or Replace Pipelines that Have the Potential for Failure</u>					
c.) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because there are no existing or proposed schools within 0.25 mile of the marsh.	None.	The Tule Red project site is not within 0.25 mile of an existing or proposed school; it is located within the middle of Suisun Marsh and immediately adjacent to open water. Therefore, there is no potential to affect schools. Impacts would not occur.
h) Expose people or structures to a significant risk of the loss, injury, or death involving wildland fires, including in areas where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because, given the location of the marsh (surrounded by water and wet most of the time), wildland fires could not occur. In addition, the activities in the marsh would not be located in areas where wildlands are adjacent to urban areas such that a wildland fire risk would occur. Finally, activities within the SMP would not bring people to wildland areas with a risk of fire and would not increase the number of people living in wildlands, resulting in a risk of fire.	None.	The Tule Red project site is located within the middle of Suisun Marsh and immediately adjacent to open water (Grizzly Bay); it does not involve the construction structures. Therefore, there is no potential to expose people or structures to a significant risk of the loss, injury, or death involving wildland fires. Impacts would be less than significant.

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<b>HYDROLOGY AND WATER QUALITY (WATER SUPPLY AND MANAGEMENT, WATER QUALITY, GROUNDWATER, FLOODING, AND SEDIMENT TRANSPORT) <sup>1</sup></b>								
None.	WTR-1: Reduction in Water Availability for Riparian Water Diversions to Managed Wetlands Upstream or Downstream of Restoration Areas	LS	None required	—	No description of specific restoration activities.	<p>The impact would be due to a change in timing related to water availability for the managed wetlands and changes in tidal elevations. Tidal flows into restored tidal wetlands may affect the tidal range in sloughs adjacent to the restored tidal wetlands.</p> <p>The changes in tidal elevation could affect the timing of water availability to the riparian diversions. For one season or a portion of one season, the timing of water availability may experience a small change on a diurnal basis due to reduced tidal elevation differences.</p>	<p>The RMA hydrodynamic model was used to evaluate impacts and showed the following:</p> <ul style="list-style-type: none"> <li>• RMA model assumed all tidal wetland restoration occurred at one time and looked at the immediate effect on tidal elevations of the total restoration</li> <li>• The simulations did not consider how sea level rise may interact with the tidal restoration actions when predicting tidal elevation changes</li> <li>• The simulations did not look at tidal elevation changes from tidal restoration actions after the change to determine if the potential tidal elevation changes would continue over any part of the SMP planning horizon</li> </ul>	<p>There are no water users downstream of the project site because Grizzly Bay is located downstream of the project site. The breach was moved to the northern end of the project site to avoid potential impacts on the Roaring River Distribution System, which is south and east of the project site. Thus, the breach location is not expected to affect this system. The project site is not hydrologically connected to the Grizzly King site and therefore is not expected to affect this area. Tidal velocities and elevations are expected to be within baseline conditions or those predicted by the SMP EIS/EIR per hydrologic modeling (Appendix D.2, <i>Hydraulic and Geomorphic Basis of Design Report</i>, and NHC pers. comm.). The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>

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None.	WTR-2: Increased Tidal Velocities from Breaching of Managed Wetlands Levees	LS	None required	—	<ul style="list-style-type: none"> <li>Levee breaches</li> </ul>	<p>Tidal velocities in the marsh channels and sloughs are generally moderate, with maximum velocities of between 1 and 2 fps, depending on the size of the channel cross section and the upstream tidal volume (upstream area). These maximum tidal velocities occur regularly (four times each day). An increase in average channel velocity of more than 2 fps or an increase of more than 1 fps in an existing channel is considered a significant change in tidal velocities and may result in local sediment scour or vegetation disruption. Breaches will be designed to ensure that tidal flows remain below 3 fps to prevent tidal muting or scouring caused by the increased water surface gradient during peak tidal flows in channels with relatively high velocities.</p>	<p>Tidal restoration breach location, number, and size would be chosen on a project-specific basis and based on two considerations:</p> <ul style="list-style-type: none"> <li>To maximize the ecological benefits of the restoration, and</li> <li>To minimize <b>upstream</b> tidal muting, tidal elevation changes, slough channel scour, and hydraulic changes; restoration projects would be designed to ensure that changes in tidal flows remain below about 1 fps. In general breaches on larger channels or multiple breaches would reduce the effects of the increased tidal flows on tidal elevations and velocities. If feasible, based on site-specific conditions, breach locations would be located in areas that have minimal or no existing tidal wetlands on channel berms or in locations where the tidal wetland habitat value is lowest (e.g., riprap levee sections).</li> </ul> <p><u>Project Design Features:</u></p> <ul style="list-style-type: none"> <li>Restoration designs will incorporate breach locations to minimize upstream tidal muting, tidal elevation changes, channel scour, and hydraulic changes. This can be accomplished by locating breaches on larger channels or allowing more openings to reduce the effects of the increased tidal flows on tidal elevations and velocities.</li> </ul>	<p>As described in Appendix D.2, <i>Hydraulic and Geomorphic Basis of Design Report</i>, internal tidal channels (i.e., not connected to other sloughs or waterways) would have velocities of 2 to 3 fps. In Grizzly Bay (modeled at approximately 1,500 feet out into the bay from the site), velocities are only 0.2 fps (NHC pers. comm.). The 0.2 fps velocity is consistent with existing-condition velocities, indicating the local impacts on velocity do not extend out that far (NHC pers. comm.). As such, the impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</p>

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<p>a.) Violate any water quality standards or waste discharge requirements.</p> <p>f.) Otherwise substantially degrade water quality.</p>	<p>WQ-1: Increased Salinity in Suisun Marsh Channels from Increased Tidal Flows from Suisun Bay (Grizzly Bay) as a Result of Restoration</p>	LS	None required	—	No description of specific restoration activities.	Additional tidal wetland within the marsh would increase tidal flows throughout the marsh channels and could increase the salinity in the channels between Suisun Bay and the new tidal wetlands. The magnitude of the salinity effects would depend on the location (and breach connection) of the new tidal wetlands and the size (acreage) of the new tidal wetlands. Restoration with tidal connection to Suisun Bay or Honker Bay may have the largest salinity effects, and the effects would be greatest during periods of low delta outflow when Suisun Bay salinity is highest and the salinity gradients within Suisun Bay and along Montezuma Slough are strongest. Models suggest that monthly salinity changes would most likely be less than about 5% to 10% of the baseline monthly salinity value.	Seasonal magnitude of salinity in the marsh would continue to be governed primarily by delta outflow and operation of the SMSCG.	The Tule Red project site was selected because of its large frontage on Grizzly Bay, a known habitat for delta smelt, longfin smelt, and listed salmonids; its existing ground elevations of 3 to 6.5 feet; and the existing setback levee, built to an elevation of 10 feet. The proposed project was modeled using the RMA Bay-Delta Model, which was used on the SMP EIS/EIR (Appendix D.1, <i>Salinity Modeling Analysis of the Proposed Tule Red Tidal Marsh Restoration</i> ). The model results confirmed that the very small changes in salinity in four areas (Jersey Point, Emmaton, and Mallard Island and the south delta export locations) are within the objectives of the SMP EIS/EIR for maintaining increases in baseline salinity to below 10% (Appendix D.1). Therefore, as confirmed by model results, the seasonal magnitude of the marsh would continue to be governed primarily by delta outflow and the operation of the SMSCG (Appendix D.1). The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	<p>WQ-2: Changes to Salinity of Water Available for Managed Wetlands from October to May</p>	LS	None required	—	No description of specific restoration activities.	Models predict that salinity changes at Suisun Marsh monitoring locations, including the eastern channels, would be much less than the maximum allowed by monthly objectives. Any change in salinity would be substantially less than 10% with respect to the objectives for those locations. Additionally, the seasonal salinity pattern (determined primarily by delta outflow) would remain similar, and any potential change to salinity should not reduce the value of marsh channel water for managed wetland flood and drain operations.	No information incorporated	There are no managed wetlands downstream of the project site; therefore, restoration is not expected to change the salinity of water available for managed wetlands downstream. In addition, modeling results showed very little changes in salinity as a result of restoration (Appendix D.1, <i>Salinity Modeling Analysis of the Proposed Tule Red Tidal Marsh Restoration</i> ). No ECs or MMs were identified in the SMP EIS/EIR impact analysis. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.



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	WQ-3: Increased Salinity at Delta Diversions and Exports	LS	None required	—	No description of specific restoration activities.	The largest increase in upstream salinity would be much less than 10% of the average baseline salinity, with no month increasing by more than 10% of any pertinent salinity objective. Tidal restoration would be designed consistent with modeling, which indicates that any increases in salinity in channels and sloughs upstream can be eliminated by physically connecting tidal wetlands to existing marsh channels rather than directly to Suisun Bay.	No information incorporated	Same as Impact WQ-2. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
	WQ-4: Possible Changes to Methylmercury Production and Export as a Result of Tidal Restoration	LS	None required	—	No description of specific restoration activities.	Tidal wetland restoration in Suisun Marsh will not result in increased methylmercury compared to the baseline export of mercury (total or methyl-) in sediment or soils from managed wetlands to tidal sloughs during flood and drain activities.	Per the conceptual model for the SMP, in cooperation with regional monitoring and research efforts, sediment and fish monitoring will be conducted at several restoration sites.	The project site has documented levels of total Hg and MeHg, similar to other managed wetlands in Suisun Marsh (Appendix C, <i>Methylmercury and Dissolved Oxygen Technical Memorandum</i> ). As described in Appendix C, tidal wetlands have very little active management when compared to managed wetlands and are expected to have a lower potential for MeHg formation as a result. Converting managed wetlands to tidal systems would reduce episodic discharges of high MeHg and low DO water as a result of greater flow, reducing concentrations and MeHg formation in slough sediments. For example, restoration at Blacklock in Suisun showed that long-term MeHg concentrations had declined following conversion because of higher hydrologic exchange between the marsh and surrounded slough waters (Appendix C). As appropriate, monitoring may occur on the Tule Red restoration site as part of permitting and/or coordination with the Regional Water Quality Control Board to adaptively manage the site over time and monitor total Hg and MeHg (Appendix C). The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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	WQ-6: Temporary Changes in Water Quality during Construction Activities	LS	None required	—	No description of specific restoration activities, except levee breaching.	Remobilization of sediments into the water column caused by restoration activities such as levee breaching can lead to temporary localized increases in SS and DO. However, construction activities would be spread throughout the marsh and over the 30-year implementation period.	<b>Environmental Commitments:</b> <ul style="list-style-type: none"> <li>• Erosion and Sediment Control Plan</li> <li>• SWPPP</li> <li>• HMMP</li> </ul>	The Tule Red project would incorporate the ECs noted here and as described in Appendix F and Chapter 2 of the SMP EIS/EIR, with the following exception: <ul style="list-style-type: none"> <li>• An HMMP would be included in the SWPPP; the HMMP would not include implementation of a risk management plan, which, as the SMP EIS/EIR indicates, is for large-scale projects.</li> </ul> The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
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 a pre-existing nearby well would drop to a level that would not support existing land uses or planned uses for which permits have been granted).	GW-6: Potential for Altered Salinity in Shallow Suisun Marsh Groundwater	LS	None required	—	No description of specific restoration activities.	Restoring tidal connectivity and increasing the acreage of tidal wetland in Suisun Marsh would increase the area exposed to saline and brackish surface water. However, in normal water years, restoration would most likely have little to no effect because of freshwater flushing. In dry periods, when recharge is diminished, there could be infiltration of saline waters into shallow subsurface areas in the marsh.  Wells in Suisun Marsh are not used for potable, municipal, or agricultural supply; even if producing aquifers were affected, there would be little or no effect on the use of well water.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
d.) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface water runoff in a manner that would result in flooding on- or off-site.	FC-1: Increased Potential for Catastrophic Levee Failure and Flooding Resulting from Restoration Activities that Expose Interior Levees to Tidal Action	LS	None required	—	<ul style="list-style-type: none"> <li>• Levee breaches and “other wetland restoration actions”</li> </ul>	As a result of levee breaches and other actions that may be implemented as part of SMP tidal wetland restoration actions, interior levees may become exterior levees, thereby increasing their exposure to tidal action for which they were not intended.	Improvements would be implemented prior to breaches that would expose them to tidal action to ensure that there is no point during which an unimproved interior levee would be exposed to tidal action.	The existing interior levee on the project site would be improved through the construction of a habitat berm (Hultgren-Tillis 2015). This berm would protect Grizzly King and the Grizzly Island Wildlife Area from tidal action (Hultgren-Tillis 2015). No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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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.	FC-2: Changes in Flood Stage and Flow Capacity in Suisun Marsh Channels as a Result of Increased Tidal Prism and Flood Storage Capacity	Beneficial	—	—	No description of specific restoration activities.	Hydraulic modeling suggests that the addition of tidal prism through the breaching of levees and restoration of tidal wetlands would reduce tidal stages in the adjacent channels. The reduction in stage in channels adjacent to restoration areas would most likely be a beneficial change relative to flooding because the channels would have a greater carrying capacity during storm events, and levees within the restoration area would be improved to meet exterior levee standards.	No information incorporated	The Tule Red project site is located within the Suisun Marsh and immediately adjacent to open water (Grizzly Bay); it does not involve the construction of structures. Therefore, there is no potential to expose people or structures to a significant risk of loss, injury, or death involving flooding. In addition, tidal velocities and elevations are expected to be within baseline conditions or those predicted by the SMP EIS/EIR per hydrologic modeling (Appendix D.2, <i>Hydraulic and Geomorphic Basis of Design Report</i> , and NHC pers. comm.). No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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c.) Substantially alter the existing drainage patten of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on-or off-site.	ST-1: Increased Scour in Bays or Channels Upstream and Downstream of Habitat Restoration Areas	LS	None required	—	<ul style="list-style-type: none"> <li>Breaching levees</li> </ul>	<p>Each new levee breach would experience local scour as increased volumes of water pass through the opening on the tidal cycle and during flood events.</p> <p>Some adjacent channels would scour and increase their conveyance areas to supply additional tidal water volumes to the new habitats.</p>	<p><u>Project Design Features:</u></p> <ul style="list-style-type: none"> <li>Breach locations would be selected to minimize scour and channel hydraulic changes.</li> <li>Project proponents will use an accurate tidal hydraulics and salinity model (e.g., the RMA Bay-Delta model or other appropriate model) to simulate the proposed action and ensure that impacts related to scour, sedimentation, salinity, and other hydraulic processes do not exceed those described in the SMP EIS/EIR. This information will be used to adjust designs of restoration projects and other activities to minimize adverse impacts on tidal elevations and velocities, or other site-specific characteristics, in the restoration site and/or in marsh channels adjacent to restoration projects; minimize salinity effects at upstream delta locations; and potentially create benefits related to scour and sedimentation.</li> <li>Site-specific hydraulic simulation modeling and scour analysis would occur.</li> </ul>	<p>Through a process of refined breach location selection, the Tule Red project breach location was selected for the northern part of the existing exterior natural berm would result in the fewest sour and hydrologic changes. Previously, removing both the existing tide gates without a breach had been considered, but this would most likely result in a severely muted tidal cycle, erosion of the existing berm for protecting the Grizzly Island Wildlife Area and the neighboring duck club, and hydraulic impacts on neighboring properties that drain/flood from the dial channels connected to the project site (i.e., dampening of flood/drain levels). As discussed in Impact VEG-1 and Appendix D.2, the Tule Red project is not expected to increase scour downstream. Modeling results predict that in Grizzly Bay (modeled at approximately 1,500 feet out into the bay from the site), velocities are only 0.2 fps (NHC pers. comm.). The 0.2 fps velocity is consistent with existing-condition velocities, indicating the local impacts on velocity do not extend out that far (NHC pers. comm.). The results of the numerical modeling and observations of other tidal marsh sites around Suisun and San Pablo Bay do not indicate that a scour hole is likely to form at the entrance to the project site (NHC pers. comm.). The invert of the tidal channel across the mud flat is typically higher than inside the marsh itself. As the flow moves out of the marsh and onto the mud flat, it is less laterally confined, reducing the unit discharge, velocity, and therefore applied hydraulic shear stress. This reduces the likelihood of a deeper scour hole forming (NHC pers. comm.). Thus, site-specific hydraulic simulation modeling and scour analysis has occurred as prescribed by the SMP. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red.</p>

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	ST-2: Deposition of Sediment in the Restored Tidal Wetlands	LS or B	None required	—	<ul style="list-style-type: none"> <li>Breaching exterior levees and dikes</li> </ul>	Suspended sediment from the water column will be deposited as a result of levee and dike breaching, removal of the levee or dike, and restoring tidal function to the managed wetland areas. Natural deposition within the tidal wetlands would restore a range of wetland elevations, providing the expected tidal habitat conditions.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
None.	ST-3: Changes in Regional Sedimentation and Scour Patterns in Suisun Marsh	LS	None required	—	<ul style="list-style-type: none"> <li>Breaching exterior levees and dikes</li> <li>Dredging</li> </ul>	<p>The increased marsh area would effectively increase the tidal prism. An increase in the tidal prism would increase local channel velocities and provide greater low-velocity tidal habitats in the restored wetland areas, which would change overall sedimentation in Suisun Marsh. Some channels may experience local scour attributable to increased velocity as more water travels to the restoration areas.</p> <p>Restoration areas would have greater capacity to trap or accept deposited sediments.</p> <p>Areas that are typically targeted for dredging would most likely remain areas of deposition; therefore, the local supply of sediments for levee maintenance and strengthening is not expected to be reduced.</p>	No information incorporated	Similar to Impact ST-1. In addition, the Tule Red project would not require dredging, and therefore, the analysis associate with dredging activities within the SMP EIS/EIR is not applicable to the Tule Red project. Impacts would be less than significant.
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.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities under the SMP would not create additional sources of runoff or involve stormwater drainage systems.	None.	The Tule Red project would incorporate a SWPPP; it does not involve construction of stormwater drainage systems; therefore, there is no potential for the Tule Red project to exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Impacts would be less than significant.
g.) Place housing within a 100-year flood hazard area, as mapped on a federal flood hazard boundary or flood insurance rate map or other flood hazard delineation map.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities under the SMP do not involve housing.	None.	The Tule Red project would not involve construction of housing; therefore, there is no potential for the Tule Red project to place housing within a 100-year flood hazard area. Impacts would be less than significant.

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h.) Place structures that would impede or redirect floodflows within 100-year flood hazard areas.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities under the SMP do not involve building structures.	None.	The Tule Red project would not involve the construction of structures; therefore, there is no potential for the Tule Red project to place structures that would impede or redirect floodflows within 100-year flood hazard areas. Impacts would be less than significant.
j.) Inundation by seiche, tsunami, or mudflow.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities under the SMP would not increase the potential for: <ul style="list-style-type: none"> <li>• Seiche, given that seiches occur primarily in lakes; the SMP is not located near or on a lake</li> <li>• Mudflow, given mudflows need significant slop and runoff to occur and most of the area of the SMP is flat</li> </ul> Although a tsunami could affect the marsh, the SMP would not increase the potential for being affected by a tsunami, and activities under the SMP (restoration of tidal wetlands and levee maintenance) would allow the marsh to be better protected in case of a tsunami.	None.	The Tule Red project would not involve the construction of structures and would not bring substantial numbers of people to Suisun Marsh; therefore, there is no potential for the Tule Red project to expose people or structures to inundation by seiche, tsunami, or mudflow. Although a tsunami could affect the project site, restoration activities would not increase the potential for being affected by a tsunami, and activities under the SMP (restoration of tidal wetlands and levee maintenance) would allow the marsh to be better protected in case of a tsunami. Impacts would be less than significant.
<b>LAND USE (LAND USE)<sup>1</sup></b>								
b.) Conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local costal program, or zoning ordinance) adopted for the purposes of avoiding or mitigating an environmental effect.	LU-1: Alteration of Existing Land Use Patterns	LS	None required	—	No description of specific restoration activities.	The entire marsh would remain classified as marsh or agricultural land. If agricultural lands are obtained for restoration and converted to marsh, the newly designated use would be consistent with Solano County General Plan policy for agriculture, which states that agricultural land may be redesignated to marsh. Although there could be a shift in site-specific uses, the overall current use of the marsh for recreational activities (hunting, fishing, wildlife viewing, walking, etc.) would not change.	No information incorporated	The Tule Red project meets all the criteria of a covered action, as defined by the Delta Plan and PRC 21056; therefore, it is subject to the policies of the Delta Plan. The criteria are as follows: <ul style="list-style-type: none"> <li>• Will occur, in whole or in part, within the boundaries of the delta or Suisun Marsh (the Tule Red project site is located within Region 4 of Suisun Marsh)</li> <li>• Will be carried out, approved, or funded by a state or local public agency (the Tule Red project proponent is currently SFCWA, but the long-term goal is to transfer the project site to CDFW)</li> </ul>

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								<ul style="list-style-type: none"> <li>• Is covered by one or more provisions of the Delta Plan (the following policies are applicable to the Tule Red project: ER P2, Restore Habitats at Appropriate Elevations; ER P3, Protect Opportunities to Restore Habitat; ER P5, Avoid Introductions of and Habitat Improvements for Invasive Nonnative Species; DP P2, Respect Local Land Use When Siting Water or Flood Facilities or Restoring Habitat)</li> <li>• Will have a significant impact on the achievement of one or both of the co-equal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the delta (will restore 420 acres of existing managed wetlands to tidal habitat).</li> <li>• The Tule Red project is consistent with the Delta Plan and the land use designations for the marsh given that it is a restoration project intended for the benefit of fish species and terrestrial biological species. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.</li> </ul>

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	LU-2: Conflict with Existing Land Use Plans, Policies, and Regulations	NI	—	—	No description of specific restoration activities.	The Solano County General Plan, Suisun Marsh Protection Plan, and the Suisun Marsh Protection Act of 1977 are the primary policies that have jurisdiction and provide land use guidance in the plan area. The plans and act call for the preservation and enhancement of aquatic habitat wherever possible. The SMP is aligned with and intended to further these and other preexisting goals. The Travis Air Force Base Land Use Compatibility Plan includes a restriction on land use in the marsh regarding the height of any structures. The proposed project would not build any new structures beyond duck clubs and other small facilities.	No information incorporated	The Tule Red project is consistent with the Solano County General Plan, the Suisun Marsh Protection Plan, and the Suisun Marsh Protection Act of 1977. The Tule Red project would not construct new structures, and therefore, conditions outlined in the Travis Air Force Base Land Use Compatibility Plan do not apply. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would not occur.
c.) Conflict with any applicable habitat conservation plan or natural community conservation plan.	LU-3: Conflict with Any Applicable Habitat Conservation Plan or Natural Community Conservation Plan	NI	—	—	No description of specific restoration activities.	The SMP would not conflict with the existing Suisun Marsh Protection Plan, and there are no other known conservation plans that affect the project area.	No information incorporated	Same as Impact LU-1. Impacts would be less than significant.
a.) Physically divide an established community.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this Appendix G impact because activities in the SMP would not physically divide an established community because it would continue to support and maintain some of the private land uses within the existing marsh.	None.	The Tule Red project does not involve dividing an established community because no communities exist on the project site. Impacts would not occur.



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<b>NOISE (NOISE) <sup>1</sup></b>								
a.) Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.	NZ-1: Temporary Increases in Ambient Noise during Construction Activities Associated with Restoration	LS	None required	—	No description of specific restoration activities.	Most noise associated with construction activities would be highly localized. Noise from trucks would occur on roads throughout the plan area and on roads used to access specific project sites. Because noise-sensitive land uses are sparsely located throughout the plan area, it is unlikely that noise from these activities would have a substantial impact on any sensitive receptors.	<b>Environmental Commitment:</b> <b>Noise compliance.</b>	Construction activities could occur from sunup to sundown depending on the construction scenario used as described in Tables 3-4a through d. However, there are no residences or sensitive receptors near the project site. Therefore, the noise compliance EC would not need to be implemented as part of the Tule Red project. Impacts would be less than significant.
d.) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity, above levels existing without the project.								
b.) Expose persons to or generate excessive groundborne vibration or groundborne noise levels.	NZ-2: Temporary Exposure of Sensitive Land Uses to Groundborne Vibration or Noise from Construction Activities	LS	None required	—	No description of specific restoration activities.	Noise-sensitive land uses could be exposed to vibration resulting from heavy equipment operation. However, residences are not anticipated to be located within 75 feet of heavy equipment operation.	No information incorporated	Same as Impact NZ-1. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
a.) Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.	NZ-3: Permanent Increases in Ambient Noise	LS	None required	—	No description of specific restoration activities.	Noise generated from individual site-specific projects would occur sporadically over the 30-year implementation period. This could result in slight isolated occurrences of increased noise that, together, would represent an overall permanent (30-year) increase in ambient noise in Suisun Marsh. Because specific projects would occur throughout the plan area over time, it is not expected that overlaps in substantial noise generation would occur in the same areas of the marsh and affect the same sensitive receptors at the same time in a manner that would be considered permanent.	No information incorporated	Similar to Impact NZ-1. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.
c.) Result in a substantial permanent increase in ambient noise levels in the project vicinity, above levels existing without the project.								

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a.) Expose persons to generate noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.	NZ-4: Exposure of Noise-Sensitive Land Uses to Noise from Material Hauling Operations	LS	None required	—	<ul style="list-style-type: none"> <li>Truck removal</li> <li>Import of levee materials</li> <li>Import of riprap and other construction materials</li> </ul>	Noise from project-related trucking operations is not predicted to exceed 60 dBA $L_{eq}$ within about 100 feet of the trucking activity. It is unlikely that trucking noise would exceed 60 dBA $L_{eq}$ at the outdoor use areas of any residences.	No information incorporated	Same as Impact NZ-1. Impacts would be less than significant.
d.) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity, above levels existing without the project.								
e.) For a project located within an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this Appendix G impact, given that the marsh is not located within an airport land use plan or the vicinity of a private airstrip.	None.	The Tule Red project site is not covered under an airport land use plan or in the vicinity of a private airstrip; therefore, there is no potential for noise from airstrip uses to affect the project site. Impacts would not occur.
f.) For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.								

CEQA Guidelines Appendix G Impact	SMP EIS/EIR Impact	SMP EIS/EIR: Significance before Mitigation	SMP EIS/EIR: Mitigation Measures (MMs)	SMP EIS/EIR: Significance after MMs	SMP EIS/EIR Description of Restoration Activities Evaluated	SMP EIS/EIR Impact Analysis Summary	SMP Assumptions or Environmental Commitments (ECs) Identified in Impact Analysis or Chapter 2 of the SMP EIS/EIR	Tule Red Project <sup>1</sup>
<b>RECREATION (RECREATIONAL RESOURCES)<sup>1</sup></b>								
<p>a.) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.</p> <p>b.) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.</p>	[No impact headers, just a discussion]	[No determination] <sup>12</sup>	None required	—	No description of specific restoration activities.	<ul style="list-style-type: none"> <li>• Recreation areas that could be affected by restoration activities include Belden’s Landing, Peytonia Slough Ecological Preserve, Hill Slough Wildlife Area, Grizzly Island Wildlife Area, Rush Ranch, and some private duck clubs.</li> <li>• Most land-based activities would be unaffected by actions related to implementing the SMP or its alternatives. Non-motorized recreational boating (e.g., kayaking and canoeing) would be most affected if velocity changes were substantial in sloughs where breaching occurs.</li> <li>• Restoration activities that affect the waterside of exterior levees could temporarily disrupt recreational boating, personal watercraft use, and fishing in the area. In-channel or near-channel work may require that a portion of the channel be temporarily blocked to reduce the risk of boating hazards.</li> <li>• The conversion to tidal wetlands may alter use patterns in these areas by dabbling ducks, which are favored by local marsh hunters and clubs. This waterfowl guild includes mallard, gadwall, northern shoveler, northern pintail, green-winged teal, and Canada goose. Additionally, the shift from managed to tidal wetlands as a result of the club owners willful sale of their property may reduce the total number of private hunters allowed in the marsh on busy days, such as opening day of the</li> </ul>	<p><b><u>Environmental Commitments: Traffic and Navigation Control Plan and Emergency Access Plan, and Recreation Best Management Practices, including:</u></b></p> <ul style="list-style-type: none"> <li>• Construction and restoration activities will occur in a manner that allows boating access through half the channel cross section at all times</li> <li>• Construction will not occur during major summer holiday periods</li> <li>• Warning signs and buoys will be posted at, upstream of, and downstream of all construction equipment, sites, and activities</li> <li>• Adequate warning will be provided regarding activities and equipment in construction sites</li> </ul>	No recreational or recreational boating facilities are associated with the project. Therefore, the ECs would not need to be implemented as part of the Tule Red project. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

<sup>12</sup> The SMP does not propose construction or a change related to existing recreation facilities that can be evaluated in terms of impacts or significance under CEQA, but it does affect certain recreational opportunities. The discussion in this section is therefore strictly a National Environmental Policy Act (NEPA) analysis regarding potential effects on recreation resources, access, and social effects such as recreational uses.

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						<p>hunting season, because of the reduction in the number of acres of managed wetlands. It is expected, however, that existing and newly restored public lands and the remaining duck clubs would provide plenty of hunting opportunities during most days of the year.</p> <ul style="list-style-type: none"> <li>Hunting and other recreational activities would still occur on public lands, and public opportunities may increase as a result of the tidal restoration.</li> <li>Fishing opportunities may increase with the increase in tidal wetland and open-water habitats with navigable waters.</li> <li>The plan would result in a net increase in navigable areas, thereby increasing potential boating opportunities in the marsh.</li> </ul>		

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<b>TRANSPORTATION AND TRAFFIC (TRANSPORTATION AND NAVIGATION)<sup>1</sup></b>								
<p>a.) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including, but not limited to, intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit.</p> <p>b.) Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures, or other standards established by the county congestion management agency, for designated roads or highways.</p>	<p>TN-1: Temporary Addition of Vehicles to Roadway System and Alteration of Patterns of Vehicular Circulation during Construction Activities</p>	<p>LS</p>	<p>None required</p>	<p>—</p>	<ul style="list-style-type: none"> <li>• Construction activities</li> <li>• Importation of fill and other materials</li> </ul>	<ul style="list-style-type: none"> <li>• Construction-related impacts could result from trips made by workers while traveling to or from a project site and trucks that deliver construction equipment.</li> <li>• During critical construction periods, public access would be restricted or controlled. Materials may be brought to a project area by barge and/or by truck. Short-term construction traffic would include work crews and trucks that deliver equipment and materials. The substantial amounts of fill that are hauled to project areas by trucks, as well as construction-related equipment and workers' vehicles, could result in adverse impacts on transportation, including rail and public transit, depending on the number of trucks, total truck trips, and the roadways used.</li> </ul>	<p><b><u>Environmental Commitment:</u></b> <b>Traffic and Navigation Control Plan and Emergency Access Plan</b></p>	<p>The Tule Red project would not require the import or export of fill materials. Therefore, the SMP EIS/EIR analysis that applies to those activities would not be applicable. As such, this EC would not need to be implemented. Impacts would be less than significant.</p>

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d.) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	TN-2: Temporary Increases in Road Hazards during Construction Activities	LS	None required	—	No description of specific restoration activities.	<ul style="list-style-type: none"> <li>The majority of the proposed project would be constructed away from existing major road networks and areas of residential or urban development. As such, the likelihood of accidents involving construction equipment and potentially dangerous situations for the general public is low.</li> <li>Hazards increase when roads are narrow or have characteristics that make maneuvering difficult, large equipment and/or equipment that is difficult to maneuver is transported, or the roadways include those that are used by the general public to access various areas of the marsh.</li> </ul>	<p><b>Project Design Feature:</b> Restoration design planning will take into account access to the site, but potential road hazards may remain.</p> <p><b>Environmental Commitment:</b> <b>Traffic and Navigation Control Plan and Emergency Access Plan</b></p>	The Tule Red project would involve limited work on the exterior natural berm adjacent to Grizzly Bay for approximately 2 weeks within a 2-month period. This work would have a limited extent (70 to 120 feet in length) for a limited duration (less than 2 weeks); therefore, it has little potential to result in a navigation hazard for boaters in Grizzly Bay. In addition, the bay is large enough for ships and boats to navigate away from any localized increase in velocities around the breach area. Finally, the exterior natural berm is not currently used for emergency access. Therefore, the EC cited in Section 5.6 of the SMP EIS/EIR, as well as Appendix F of the SMP EIS/EIR, is not applicable. Impacts would be less than significant.
None.	TN-3: Damage to Roadway Surfaces from Construction Activities	LS	None required	—	<ul style="list-style-type: none"> <li>Transport of construction material</li> </ul>	Implementing the proposed project would require the transport of construction equipment and material, including, but not limited to, long-reach excavators, excavators, dozers, box scrapers, tractors, pipes, riprap, etc. Some roads within the marsh may not be designed to accommodate such traffic; therefore, there is potential for damage to roads by construction activities, construction vehicles, and the transport of equipment.	<p><b>Environmental Commitment:</b> <b>Traffic and Navigation Control Plan and Emergency Access Plan</b></p>	Same as Impact TN-2. Impacts would be less than significant.
c.) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.	TN-5: Impacts on Land Use Attributable to Restoration Activities within Travis Air Force Base Zone	LS	None required	—	No description of specific restoration activities.	Suisun Marsh restoration would occur in Zone D of the Travis Air Force Base zoning areas. Zone D land use is restricted only by the height of the features that would be built. None of the proposed SMP activities are expected to result in major structures that would be considered tall enough to conflict with Zone D land use.	No information incorporated	The Tule Red project would not construct buildings. No additional ECs or MMs are needed for Tule Red. The impact analysis in the SMP EIS/EIR is appropriate for Tule Red, and impacts would be less than significant.

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None.	TN-6: Temporary Reduction in Boat Access during Construction Activities	LS	None required	—	<ul style="list-style-type: none"> <li>In-channel work</li> </ul>	<p>In-channel work may require the reduction of some channel area available for boating and other navigation. It is expected that in-channel work related to levee breaching for restoration, specifically dredging or levee repair, would be conducted sporadically throughout the marsh over the 30-year period, would be temporary, and would not result in permanent reductions in navigable areas.</p> <p>The only major navigational channel is located in Suisun Bay, and plan activities are not expected to affect this area.</p>	<p><b>Environmental Commitment:</b>  <b>Traffic and Navigation Control Plan and Emergency Access Plan</b></p>	Same as Impact TN-2. Impacts would be less than significant.
None.	TN-7: Decrease in Rail Line Integrity and Disruption to Rail Service	LS	None required	—	<ul style="list-style-type: none"> <li>Levee breaches and other restoration activities</li> </ul>	<p>Restoration or other activities could affect the integrity of levees that hold the rail line for the Union Pacific Railroad by causing increased inundation and erosion, depending on the specific location and type of SMP activities implemented.</p> <p>Work occurring within a particular right-of-way, as determined by the railroads, may result in delays or other temporary disruptions to rail service, depending on the type of activities implemented.</p>	<p><b>Project design features:</b></p> <ul style="list-style-type: none"> <li>Breaches will be designed to avoid levees where rail lines are situated</li> <li>Restoration activities will be designed to protect rail lines</li> </ul> <p><b>Environmental Commitment:</b>  <b>Traffic and Navigation Control Plan and Emergency Access Plan</b></p>	There are no rail lines within the Tule Red project site. Same as Impact TN-2. Impacts would be less than significant.
None.	TN-8: Short-Term Reduction in Navigable Areas Resulting from Increased Velocities after Restoration Activities	LS	None required	—	<ul style="list-style-type: none"> <li>Levee breaches</li> </ul>	<p>Levee breaches associated with restoration activities could result in changes in velocities adjacent to the breach location. Increased velocities in these areas are expected to be temporary and localized to the immediate breach site location but could interfere with navigation by temporarily creating areas within the marsh that are unsafe or not navigable.</p>	<p><b>Environmental Commitment:</b>  <b>Traffic and Navigation Control Plan and Emergency Access Plan</b></p>	Same as Impact TN-2. Impacts would be less than significant.
None.	TN-9: Temporary Reduction in Boat Access during Dredging Activities	LS	None required	—	Dredging	<p>Dredging could result in temporary reductions in boat access in isolated areas throughout the marsh.</p>	<p><b>Environmental Commitment:</b>  <b>Traffic and Navigation Control Plan and Emergency Access Plan</b></p>	Implementation of the Tule Red project would not entail dredging activities; as such, the EC identified in Section 5-6 of the SMP EIS/EIR is not applicable. Impacts would be less than significant.

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None.	TN-10: Increases in Navigable Areas of Suisun Marsh	Beneficial	—	—	No description of specific restoration activities.	Restoration would lead to an increase in navigable areas, depending on which areas are restored, the beginning elevations, sedimentation rates, and sea level rise.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
a.) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including, but not limited to, intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit.	TN-11: Operations and Maintenance Increase in Traffic	LS	None required	—	No description of specific restoration activities.	Upon completion of construction of restoration, minimal traffic would be generated.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
b.) Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways.								
f.) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise decrease the performance or safety of such facilities.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities under the SMP would not conflict with public transit or bicycle or pedestrian facilities within the marsh.	None.	The Tule Red project does not involve public transportation or substantial changes to roads used by public transit; therefore, there is no potential for the Tule Red project to conflict with adopted policies, plans, or programs regarding public transit or bicycle or pedestrian facilities or otherwise decrease the performance or safety of such facilities. Impacts would not occur.



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<b>UTILITIES AND SERVICE SYSTEMS AND PUBLIC SERVICES (UTILITIES AND PUBLIC SERVICES) <sup>1</sup></b>								
None.	UTL-1: Damage to Pipelines and/or Disruption of Electrical, Gas, or Other Energy Services during Construction or Restoration Activities	S	<p><u>UTL-MM-1: Relocate Overhead Power Lines or Other Utilities that Could Be Affected by Construction</u></p> <p><u>UTL-MM-2: Avoid Ground-Disturbing Activities within Pipeline Right-of-Way</u></p>	LS	No description of specific restoration activities.	<ul style="list-style-type: none"> <li>Construction of the proposed restoration would have no impact on water conveyance or treatment facilities, stormwater drainage facilities, or communication facilities.</li> <li>Restoration activities may occur on properties with overhead lines, underground pipelines, or wells. Ground-disturbing and other activities have the potential to damage these facilities or otherwise cause outages.</li> </ul>	<b>Environmental Commitment: Standard Design Features and Construction Practices, specifically: Stop work immediately if a conflict with a utility facility occurs and contacting the affected utility to (1) notify it of the conflict, (2) aid in coordinating repairs to the utility, and (3) coordinate to avoid additional conflicts in the field.</b>	Same as Impact HAZ-3. There are no overhead power lines or underground pipelines on the project site. Therefore, the MMs identified in the SMP EIS/EIR are not applicable to the Tule Red project. The EC related to Standard Design Features and Construction Practices would be incorporated into the proposed project. Impacts would not occur.
None.	UTL-2: Damage to Utility Facilities or Disruption to Service as a Result of Restoration	S	<p><u>UTL-MM-3: Relocate or Upgrade Utility Facilities that Could Be Damaged by Inundation</u></p> <p><u>UTL-MM-4: Test and Repair or Replace Pipelines that Have the Potential for Failure</u></p>	LS	No description of specific restoration activities.	<p>Areas restored to tidal wetlands would change the general nature of properties from seasonally flooded to tidally inundated year-round. This has the potential to affect facilities that were installed prior to inundation that were not designed to exist in a tidally inundated environment.</p> <p>Inundation could change how owners/operators of utility facilities that were installed prior to inundation respond to emergencies such as leaks and ruptures. Because many of the pipelines in the marsh are older than their design life, the potential exists for these pipes to leak or rupture.</p>	No information incorporated	Same as Impact HAZ-3. There are no overhead power lines or underground pipelines on the project site. Therefore, the MMs identified in the SMP EIS/EIR are not applicable to the Tule Red project. Impacts would not occur.

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Utilities and Service Systems f.) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.	UTL-3: Reduction in Capacity of Local Solid Waste Landfills	LS	None required	—	No description of specific restoration activities.	Construction related to the proposed restoration is not expected to generate substantial amounts of solid waste. Materials removed from levees would be reused on-site as part of the restoration. Dredged material would be used for levee reinforcement, and the small amount of waste generated during construction over the 30-year plan implementation period is not expected to decrease the lifespan of landfills substantially in the plan vicinity.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
Utilities and Service Systems g.) Comply with federal, state, and local statutes and regulations related to solid waste.								
Public Services a.) Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for public services (i.e., fire protection and police protection).	UTL-4: Increase in Emergency Service Response Times	LS	None required	—	No description of specific restoration activities.	The proposed restoration would result in a temporary increase in the number of construction vehicles traveling on local roadways. These construction vehicles are not expected to cause a substantial reduction in response times for emergency service providers because there would be a minimal number of construction vehicles, activities would occur throughout the marsh, and roads in the marsh generally operate at a high level of service.  Emergency access via the water would not be disrupted because in-water work would not result in channel inaccessibility or other delays.	No information incorporated	The impact analysis in the SMP EIS/EIR is appropriate for Tule Red. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.

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Public Services a.) Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for public services (i.e., schools, parks, other facilities).	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because, typically, changes to service ratios associated with parks, schools and other community services (e.g., libraries) are related to large changes in population. The activities under the SMP do not involve any changes that would result in substantial population growth within the marsh or the surrounding areas.	None.	The Tule Red project does not involve constructing or operating public facilities or inducing significant population growth in the marsh area; therefore, it has no potential to result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for public services (i.e., schools, parks, other facilities). Impacts would not occur.
Utilities and Service Systems a.) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.  e.) Result in a determination by the wastewater treatment provider that serves or may serve the project site that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate these specific Appendix G impacts because no wastewater infrastructure is located in unincorporated Solano County. Wastewater needs in these locations are met by septic systems that have been installed by individual landowners. These systems are not connected to sewer lines but, rather, are self-contained systems that are permitted and inspected by Solano County. Furthermore, activities under the SMP would not require wastewater systems.	None.	The Tule Red project would not require the use of wastewater facilities because it is a tidal habitat restoration project; therefore, it has no potential to exceed the wastewater treatment requirements of the applicable Regional Water Quality Control Board or require the use of existing capacity from wastewater system(s). Impacts would not occur.

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Utilities and Service Systems b.) Require or result in the construction of new water or wastewater treatment facilities, or the expansion of existing facilities, the construction of which could cause significant environmental effects.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities under the SMP would not require the construction of new water or wastewater facilities or the expansion of such facilities.	None.	The Tule Red project would not require the construction of new water or wastewater facilities because it is a tidal habitat restoration project; therefore, it has no potential to require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects. Impacts would not occur.
Utilities and Service Systems c.) Require the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	None	—	—	—	Entire SMP EIS/EIR.	The marsh is dependent on levees for flood and high-tide protection of land, structures, and key infrastructure; these levees would be maintained and upgraded through implementation of the plan. Any environmental impacts associated with levee maintenance, as described under the SMP, would be disclosed in the impacts described throughout the entire SMP document.	None.	The existing interior levee would be upgraded to an exterior levee as part of the Tule Red project, which would include a habitat berm of varying slopes. No additional ECs or MMs are needed for Tule Red. Impacts would be less than significant.
Utilities and Service Systems d.) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed	None	—	—	—	None.	The SMP EIS/EIR did not evaluate this specific Appendix G impact because activities under the SMP would not require water supplies beyond those that are already in the marsh (e.g., those existing water supplies that provide surface water to existing managed wetlands).	None.	The Tule Red project would not require a water supply because it is a tidal habitat restoration project; therefore, it has no potential to need new or expanded water entitlements. Impacts would be less than significant.

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<b>POPULATION AND HOUSING (NONE)<sup>1</sup></b>								
a.) Induce substantial population growth in an area, either directly or indirectly.	None	—	—	—	None.	The SMP EIS/EIR did not evaluate these specific Appendix G impacts because activities under the SMP would not result in direct or indirect population growth, the construction of homes, or the displacement of people. Activities under the SMP would manage existing managed wetlands and restore tidal habitat. Neither of these activities involves population growth or housing.	None.	The Tule Red project would not substantially increase population, the need for housing, or the need for replacement housing because it is a tidal habitat restoration project and does not involve the construction of housing. Therefore, it has no potential to induce substantial population growth in an area, displace substantial numbers of existing homes, or displace substantial numbers of people. Impacts would not occur.
b.) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.								
c.) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.								

Table Notes:

<sup>1</sup> Unless otherwise noted, the Tule Red Restoration Project (proposed project) would incorporate all applicable ECs and/or BMPs described in Appendix F, *Mitigation Monitoring and Reporting Program*, and Chapter 2, *Habitat Management, Preservation, and Restoration Plan*, of the SMP EIS/EIR.

<sup>2</sup> First resource identified is the resource identified in the initial study checklist of Appendix G of the State CEQA Guidelines; resources in parenthesis indicate resources evaluated in the SMP EIS/EIR.

<sup>3</sup> ECs identified in the SMP EIS/EIR (2011) are bolded.

<sup>4</sup> “No information incorporated” means the SMP EIS/EIR impact analysis did not refer to specific ECs or specific assumptions related to restoration.

<sup>5</sup> Where specific SMP restoration activities in the impact analysis are not noted, assume the following (from Chapter 2):

- Site Preparation
  - Grade and prepare to recreate flows and hydraulic conditions
  - Fill ditches in with dirt, brush boxes, or other material, may include digging starter channels
  - Establish vegetation communities prior to inundation
  - Implement moist soil management
  - Maintain levees and water control structures
- Upgrade or Construct New Exterior Levees
  - Upgrade existing interior levees w/brush boxes or other biotech wave dissipaters, or construct new exterior levees
  - Construct habitat levees, depending on cost and availability of fill, by widening existing interior levees, or construct new interior levees or islands
  - Construct habitat levees from available resources, including dredged channel material and excavated material
- Breaching Levees
  - Breach edges may require scour protection with rock, geotextiles, or piles, or long reaches of the levee may be graded down to lower elevations
  - Breach location, number, and size will be chosen to maximize ecological benefits and minimize upstream tidal muting, tidal elevation changes, slough channel scour, and hydraulic changes

<sup>6</sup> MMs identified in the SMP EIS/EIR (2011) are underlined.

NI = No impact

LS = Less than significant impact

B = Beneficial

S = Significant

SU = Significant and Unavoidable



## **4.1 Westervelt**

Rob Capriola	Conservation Planner (Project Manager)
Hal Holland	Senior Conservation Planner
Kim Erickson	Associate Conservation Planner (Project Coordinator)
Matt Gause	Senior Ecologist

## **4.2 SFCWA**

Byron Buck	Executive Director
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## **4.3 ICF**

Nicole Williams	Project Manager
Lesa Erecius	Project Coordinator/Environmental Analyst
Shannon Hatcher	Senior Air Quality Specialist
Darrin Trageser	Air Quality Specialist
Harry Oaks	Senior Wildlife Biologist
Rachel Gardiner	Wildlife and Vegetation Biologist
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