Suisun Marsh
Habitat Management, Preservation, and Restoration Plan

Final
Environmental Impact Statement/ Environmental Impact Report

Executive Summary

SCH#: 2003112039

U.S. Department of the Interior
Bureau of Reclamation

U.S. Fish and Wildlife Service

California Department of Fish and Game

November 2011

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

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

The Mission of the Department of Fish and Game is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

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Executive Summary

Introduction

The Suisun Marsh Habitat Management, Preservation, and Restoration Plan, referred to from here on as the Suisun Marsh Plan (SMP), is being pursued by the Suisun Principal Agencies (or Principals), a group of agencies with primary responsibility for Suisun Marsh management, and is intended 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. It relies on the incorporation of existing science and information developed through adaptive management. The Principals are U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior, Bureau of Reclamation (Reclamation), California Department of Fish and Game (DFG), 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, such as 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 this plan.

Each Principal Agency will use this Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) to adopt particular actions described in the document and will contribute to the overall implementation of the SMP. For purposes of this document, Reclamation and USFWS are the joint National Environmental Policy Act (NEPA) lead agencies, and DFG is the California Environmental Quality Act (CEQA) lead agency. This Executive Summary summarizes the Proposed Project/Preferred Alternative and alternatives, the SMP implementation strategy, environmental commitments, and impacts and mitigation measures. It is based largely on the information provided in Chapters 1 and 2 of the SMP EIS/EIR.

Suisun Marsh Regulatory and Management Background

Suisun Marsh is the largest contiguous brackish water marsh remaining on the west coast of North America and is a critical part of the San Francisco

Bay/Sacramento–San Joaquin River Delta (Bay-Delta) estuary ecosystem. It is home to public waterfowl hunting areas and 158 private duck clubs. The Marsh encompasses more than 10% of California's remaining natural wetlands and serves as the resting and feeding ground for thousands of birds migrating on the Pacific Flyway and resident waterfowl. In addition, the Marsh provides important habitat for more than 221 bird species, 45 mammalian species, 16 different reptile and amphibian species, and more than 40 fish species. Suisun Marsh supports the state's commercial salmon fishery by providing important tidal rearing areas for juvenile fish. Approximately 200 miles of levees in the Marsh contribute to managing salinity in the Sacramento–San Joaquin River Delta (Delta). The Marsh's large open space and proximity to urban areas make it ideally suited for wildlife viewing, hiking, canoeing, and other recreation opportunities. Figure ES-1 shows the location of Suisun Marsh.

The values of the Marsh have been recognized, and several agencies have been involved in its protection since the mid-1970s. In 1974 the Nejedly-Bagley-Z'Berg Suisun Marsh Preservation Act was enacted by the California Legislature to protect the Marsh from urban development. In 1976, the BCDC developed the Suisun Marsh Protection Plan (SMPP), which defined and limited development within the primary and secondary management area for the "future of the wildlife values or the area as threatened by potential residential, commercial, and industrial development." The SMPP states that its focus is on maintaining waterfowl habitat, but it also addresses the importance of tidal wetlands. The SMPP calls for the preservation of Suisun Marsh; preservation of waterfowl habitat; improvement to water distribution and levee systems; and encouraging agriculture that is consistent with wildlife and waterfowl, such as grazing. In 1977, the California Legislature implemented the Suisun Marsh Preservation Act of 1977, which calls for the implementation of the SMPP and designates BCDC as the state agency with jurisdiction over the Marsh; it calls for the SRCD to have the primary local responsibility for water management on privately owned lands in the Marsh.

In 1987, Reclamation, DWR, DFG, and SRCD signed the Suisun Marsh Preservation Agreement (SMPA), which contains provisions for Reclamation and DWR to mitigate the adverse effects on Suisun Marsh channel water salinity from the State Water Project (SWP) and Central Valley Project (CVP) operations and other upstream diversions. It required Reclamation and DWR to meet salinity standards as specified in the then-current State Water Board D-1485, set a timeline for implementing the Plan of Protection for the Suisun Marsh, and delineated monitoring and mitigation requirements.

In 2000, the CALFED Record of Decision (ROD) was signed, which included the Ecosystem Restoration Program (ERP) calling for the restoration of 5,000 to 7,000 acres of tidal wetlands and the enhancement of 40,000 to 50,000 acres of managed wetlands (CALFED Bay-Delta Program 2000a). In 2001, the Principal Agencies directed the formation of a charter group to develop a plan for Suisun Marsh that would balance the needs of CALFED, the SMPA, and other plans by protecting and enhancing existing land uses, existing waterfowl and wildlife values including those associated with the Pacific Flyway, endangered species,

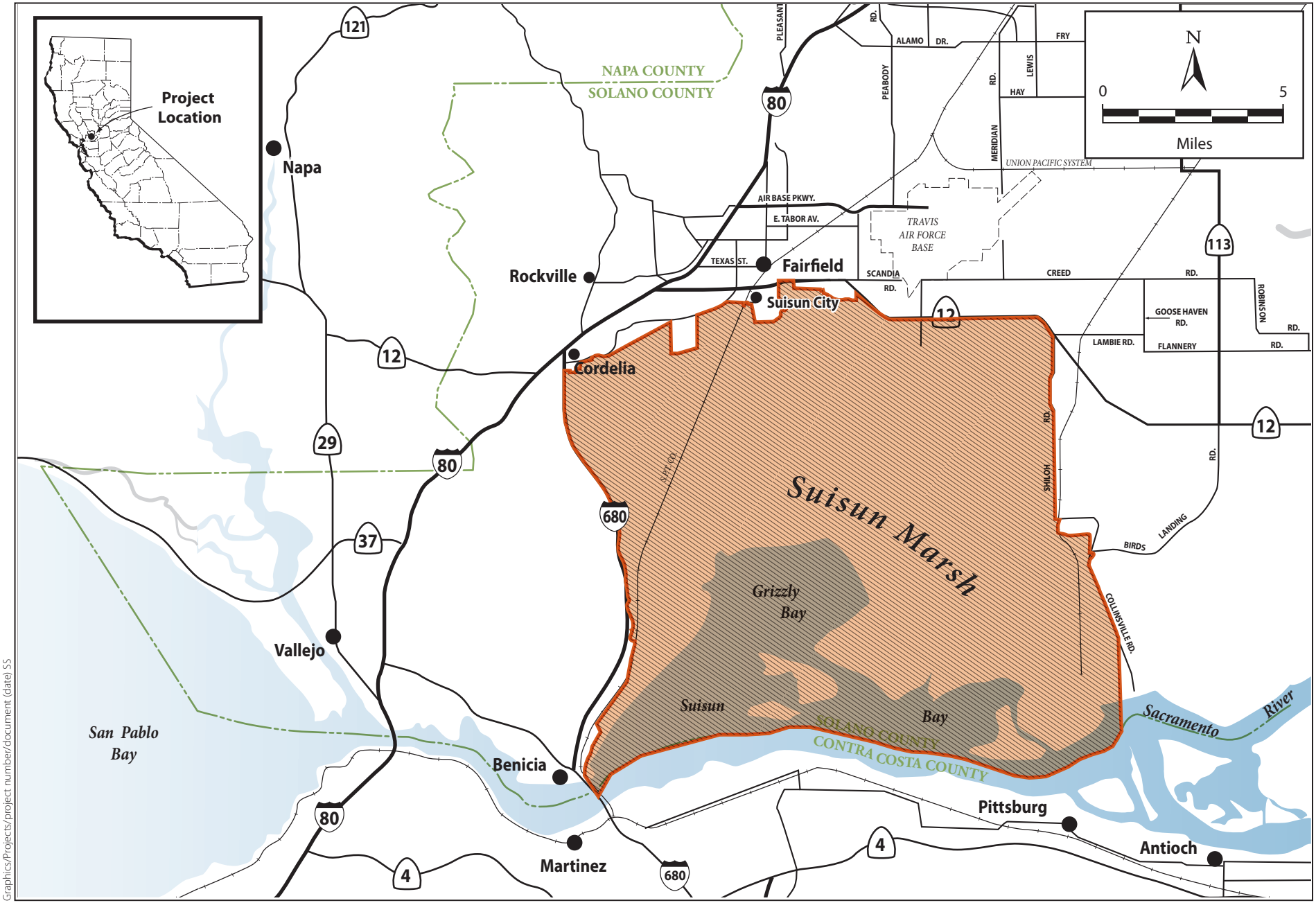

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Figure ES-1
Project Location

and state and federal water project supply quality. In addition to the Principal Agencies, the charter group includes other regulatory agencies such as the Corps, BCDC, and the State and Regional Water Boards.

This EIS/EIR describes three alternative 30-year plans and their potential impacts. The adopted alternative will become the SMP. Each Principal Agency's action related to the SMP is shown in Table ES-1. It is important to note that Principal Agencies and other agencies may choose to implement additional restoration and other activities beyond what is described in this SMP.

Table ES-1. Principal Agencies' Actions Related to the Suisun Marsh Plan

Agency	Suisun Marsh Habitat Management, Preservation, and Restoration Plan Action
Reclamation	Implementation of Managed Wetland Activities Implementation of PAI Fund[1]
USFWS	Implementation of Restoration Issuance of Biological Opinion
DFG	Implementation of Restoration Implementation of Managed Wetland Activities Issuance of Incidental Take Permit for non–Fully Protected Species Implementation of PAI Fund
NMFS	Issuance of Biological Opinion; Issuance of Essential Fish Habitat Conservation Recommendations
DWR	Implementation of Restoration Implementation of Managed Wetland Activities Implementation of PAI Fund
SRCD	Implementation of Managed Wetland Activities Implementation of PAI Fund
CALFED	Provide Guidance for Restoration through the Science Program

Reclamation = U.S. Department of the Interior, Bureau of Reclamation.
PAI = Preservation Agreement Implementation.
USFWS = U.S. Fish and Wildlife Service.
DFG = California Department of Fish and Game.
NMFS = National Marine Fisheries Service.
DWR = California Department of Water Resources.
SRCD = Suisun Resource Conservation District.
CALFED = CALFED Bay-Delta Program.

[1] The PAI Fund is included in the Revised SMPA and is proposed to fund certain maintenance activities to support mitigation obligations for the CVP and SWP operations, and is described in Chapter 2.

The Need, Purpose, and Objectives of the Suisun Marsh Plan

Need for the Suisun Marsh Plan

The SMP is a comprehensive plan designed to address the various conflicts regarding use of Marsh resources, with the focus on achieving an acceptable multi-stakeholder approach to the restoration of tidal wetlands and the management of managed 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 SMPA and CALFED. It also is intended to set the regulatory foundation for future actions. The need for the action is based on the following major Marsh resources and functions.

Habitats and Ecological Processes

The conversion of tidal wetlands as a result of diking resulted in a loss of habitat for many species, including those now listed as threatened or endangered. Development in areas surrounding the Marsh has resulted in introduction and spread of nonnative species, fish entrainment issues, and degradation of water quality. Additionally, there have been water quality effects from drainage operations in managed wetlands. While taking appropriate steps to restore the ecological values of historical tidal wetland habitat, efforts will be made to improve management of managed wetlands and to lessen adverse effects from development, nonnative species, and detrimental land use practices in the secondary management areas and adjacent metropolitan areas.

Public and Private Land Use

Managed wetlands, tidal wetlands, and uplands, whether publicly or privately owned, provide important wetlands for migratory waterfowl and other resident and migratory wetland-dependent species and opportunities for hunting, fishing, bird watching, and other recreational activities. There is a need to maintain these opportunities as well as improve public stewardship of the Marsh to ensure that the implementation of restoration and managed wetland activities is understood and valued for both public and private land uses.

Levee System Integrity

Of the more than 200 miles of exterior levees in Suisun Marsh, only about 20 miles along Suisun, Grizzly, and Honker Bays (authorized through AB 360) receive public funding. Additionally, as restoration actions are implemented, some interior levees will be converted to exterior levees and will require

reinforcement and more maintenance, and in some instances significant upgrades. Because of current restrictions preventing dredging from sloughs and constraints on importing materials, landowners in the Marsh have maintained their exterior levees using primarily material from ditch cleaning or pond bottom grading for more than a decade, a practice that increases subsidence and potentially weakens the existing levee foundations. These factors combined have exhausted the supply of levee maintenance material in the managed wetlands and have forced maintenance to be deferred on some exterior levees, increasing the risk of catastrophic flooding.

Water Quality

Multiple factors contribute to the water quality in Suisun Marsh, including upstream diversion, reduced Delta outflow, state and federal water project operations and diversions, drainage practices in managed wetlands, minimal tidal exchange in dead-end sloughs, urban runoff, erosion, agricultural runoff, discharge from the Fairfield Suisun Sewer District treatment plant to Boynton Slough, and remnant contaminants such as mercury. Improvement of water quality and management practices will benefit the ecological processes for all habitats, including managed and tidal wetlands.

Plan Objectives/Purpose

The SMP is intended to address the full range of issues in the Marsh, as described in the Need for Action section above. As such, the SMP purposes/objectives are divided by topic but are linked geographically, ecologically, and socially. The plan purposes/objectives are:

- **Habitats and Ecological Processes—**implement the CALFED Ecosystem Restoration Program Plan (ERPP) restoration target for the Suisun Marsh ecoregion of 5,000 to 7,000 acres of tidal marsh and protection and enhancement of 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 integrity to protect property, infrastructure, and wildlife habitats from catastrophic flooding; and
- **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 SMP requires that these interrelated and interdependent purposes/objectives be implemented to some extent through all SMP actions. For example, the levee

system integrity purpose/objective would ensure that managed wetlands are protected from catastrophic flooding, thus contributing to meeting the portion of the habitats and ecological processes purpose/objective that addresses protection of managed wetlands. Similarly, the restoration of certain properties may help protect and/or improve water quality, and achieving the habitats and ecological processes purpose/objective also would help to achieve the private and public land use purpose/objective. Recognizing these relationships, the SMP is proposed to contribute to meeting each of them in parallel over the 30-year planning period.

Overview of Plan Elements

The SMP is a comprehensive plan designed to address the various conflicts regarding use of Marsh resources, with the focus on achieving an acceptable multi-stakeholder approach to the restoration of tidal wetlands and the management of managed wetlands and their functions. The SMP addresses habitats and ecological process, public and private land use, levee system integrity, and water quality through restoration and managed wetland activities. The plan is intended to guide near-term and future actions related to restoration of tidal wetlands and managed wetland activities. Specific actions that would be implemented in the near term under the SMP include revising the SMPA to implement the PAI Fund and implementation of increased frequency of current and new managed wetland activities.

Alternatives

Three alternatives were evaluated in the EIS/EIR, varying in the number of acres restored and the number of acres subject to managed wetland activities. Table ES-2 summarizes these differences.

Table ES-2. Differences in Amount of Tidal Wetlands Restored and Remaining Acres Subject to Managed Wetland Activities among the Alternatives (in acres)

Alternative	Tidal Restoration Target (acres)	Managed Wetlands Subject to Managed Wetland Activities (acres)
No Action Alternative	700	52,112
Alternative A, Proposed Project	5,000–7,000	44,000–46,000
Alternative B	2,000–4,000	46,000–48,000
Alternative C	7,000–9,000	42,000–44,000

The lead agencies have identified Alternative A as the Preferred Alternative because of its consistency with the restoration and enhancement goals of the ERPP, its ability to contribute to recovery of listed species, and acceptability by landowners in the Marsh.

The total amount of existing managed wetlands and uplands that could be affected by tidal restoration and managed wetland activities is 52,112 acres. The Marsh has been divided into four regions for purposes of this analysis (Figure ES-2). The tidal wetland restoration acreages for each alternative are described by region to achieve the total CALFED goal as described above and contribute to the USFWS tidal wetlands restoration goals. The USFWS *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (http://www.fws.gov/sacramento/ea/news_releases/2010_News_Releases/tidal_marsh_recovery.htm) was used as a template in determining the goal of the percentage of restoration acreage per region (U.S. Fish and Wildlife Service 2010). Table ES-3 shows the total acreage that is potentially restorable in each region under the SMP, and how much of each region would be restored under each alternative. The SMP includes the continued implementation of and increased frequency of some managed wetland activities and the implementation of new managed wetland activities on the balance of 52,112 acres that is not restored.

Table ES-3. Total Restorable Acres per Region and Percentage That Will Be Restored under Each Alternative

Alternative/Region	SMP Target for Tidal Wetland Restoration*	Percentage of Existing Managed Wetlands That Will Be Restored to Tidal Wetland under the SMP
Alternative A, Proposed Project	**5,000–7,000**	
Region 1	1,000–1,500	8.4%–12.6%
Region 2	920–1,380	12.6%–18.9%
Region 3	360–540	12.1%–18.1%
Region 4	1,720–2,580	6.0%–9.0%
Alternative B	**2,000–4,000**	
Region 1	500–1,000	4.2%–8.4%
Region 2	460–920	6.3%–12.6%
Region 3	180–360	6.0%–12.1%
Region 4	860–1,720	3.0%–6.0%
Alternative C	**7,000–9,000**	
Region 1	1,500–2,250	12.6%–18.9%
Region 2	1,380–2,070	18.9%–28.5%
Region 3	540–810	18.1%–27.3%
Region 4	2,580–3,870	9.0%–13.5%

USFWS = U.S. Fish and Wildlife Service.

SMP = Suisun Marsh Habitat Management, Preservation, and Restoration Plan.

* The targets were developed for each region based on the different habitat conditions within each region to provide the range of environmental gradients necessary to contribute to the recovery of listed species. These targets complement and are consistent with the Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California. The Adaptive Management Plan will track these targets to ensure restoration benefits for listed species.

Note: Adjustments to the Adaptive Management Plan may result in changes to the targets in each region.

Of the restored areas, a certain portion is expected to become tidal aquatic habitat. The percent cover of tidal aquatic habitat within tidal wetlands areas (Rush Ranch, Lower Joice Island, and Hill Slough) in Suisun Marsh was estimated based on existing tidal wetlands, the Integrated Regional Wetland Monitoring Pilot Project (BREACH), and GIS and site visits. The analysis demonstrated that tidal aquatic habitat accounts for an average of approximately 5 to 15% of the total area of established tidal wetlands. Assuming this relationship holds true for future restored tidal wetlands, Table ES-4 shows the increase of tidal aquatic habitat that would be expected to result when each action alternative is fully implemented and sites develop into fully functioning tidal marshes. The increase in acreage of tidal aquatic habitat shown does not limit the amount of restoration that could occur.

Table ES-4. Increase of Tidal Aquatic Habitat in Suisun Marsh Resulting from Each Alternative

Alternative	Tidal Wetlands Restored	Tidal Aquatic Habitat Increase
Alternative A, Proposed Project	5,000–7,000	250–1050 acres
Alternative B	2,000–4,000	100–600 acres
Alternative C	7,000–9,000	350–1,350 acres

Over the 30-year SMP implementation period, it is expected that the exact habitat amount provided by restored areas will depend on the existing elevation of the site, sedimentation rates and accretion, and sea level rise. The amount of subtidal aquatic habitat is expected to decrease gradually as sediment accretes and emergent tidal vegetation is established at each restoration site. As this happens, the site will be restored to a tidal wetland. However, the rate of accretion and the rate of sea level rise will dictate the end result, and the actual timeframe for such progression depends on the site-specific conditions, but significant geomorphic changes are decadal. Locations with large subsidence and low sediment concentrations may never return to emergent marsh and instead remain as open water. Adaptive management also will be used to improve restoration designs to achieve desired results.

Suisun Marsh Plan Implementation Strategy

The SMP is predicated on the assumption that each Principal Agency will implement or approve activities in the Marsh consistent with the SMP and its own mission and jurisdictional authority. The primary components of the strategy are to:

- implement the environmental commitments and mitigation measures in this EIS/EIR and other required state and federal permit measures to ensure that resources are protected and that restoration and managed wetland goals are met simultaneously,

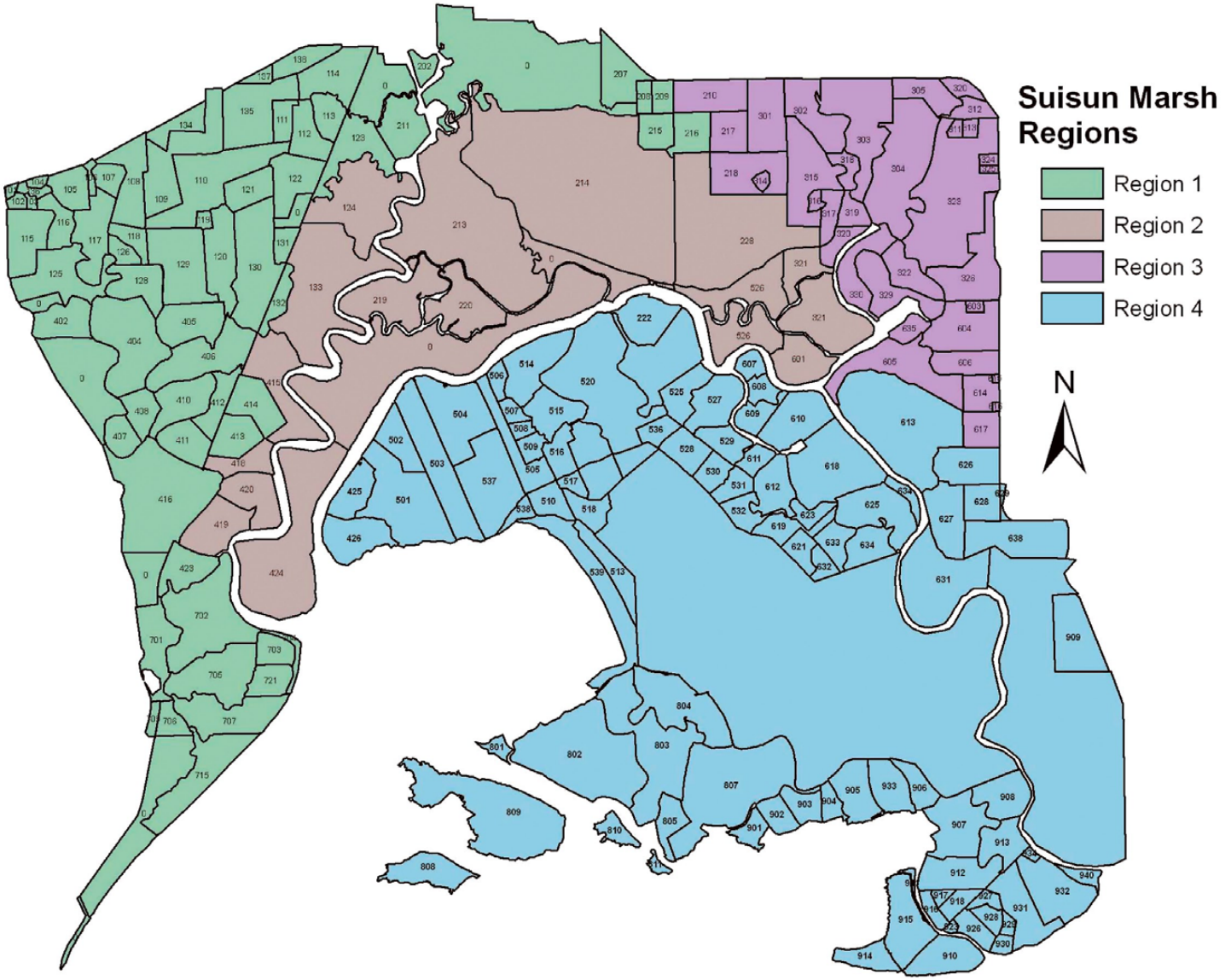

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Figure ES-2
Suisun Marsh Regions

- implement adaptive management to ensure impacts described in this EIS/EIR are not exceeded and to improve the ecological effectiveness of restoration over the period of implementation of the SMP, and
- prepare annual reports on the status of SMP restoration and managed wetland activities.

To ensure that the restoration and managed wetland goals both are achieved within the 30-year time frame, the Charter Agencies have developed a strategy to implement the SMP. The SMP would contribute to recovery of many species in the Marsh, and for this EIS/EIR, implementation of the entirety of the Proposed Project, including both the restoration activities and managed wetland activities, is an integral part of the analysis. Based on the analysis in this EIS/EIR, implementation of the Proposed Project and environmental commitments would provide sufficient tidal restoration and resource protection of fish and wildlife resources to both offset potential impacts on those resources and contribute to recovery of listed species. As such, both restoration and managed wetland activities would proceed simultaneously, and implementation will be planned to carefully monitor and mitigate the effects of SMP activities. SRCD, DFG, Reclamation, and DWR would implement the Managed Wetland Activities. Any of the Principals could implement restoration.

The managed wetland activities would be implemented only if at least one third of the total restoration activities would be implemented in each of the 10-year increments. Therefore, it is expected that under the Proposed Project, for example, 1,600–2,300 acres in the Marsh would be restored by year 10, an additional 1,600–2,300 acres would be restored by year 20, and the full 5,000–7,000 acres would be restored by year 30. This would ensure that all actions would be implemented in a timeframe similar to that of the impacts and that restoration efforts would contribute toward recovery throughout the plan implementation period. If these 10-year incremental SMP restoration goals are met, both the managed wetland activities and tidal restoration would continue to ensure that the SMP goals would be met. Options for addressing conditions in which these incremental goals are not met are described below. Under this strategy, the restoration and managed wetland goals would be achieved concurrently. How the restoration acres would be applied for purposes of other regulatory permitting requirements (i.e., recovery vs. mitigation) would be specified through each permit as applicable.

To track the progress of restoration and managed wetland activities, the SMPA agencies (Reclamation, SRCD, DWR, and DFG) would submit implementation status reports annually to DFG, NMFS, and USFWS and other regulatory agencies that would describe the implemented restoration and managed wetland activities. Additional activities, including monitoring, application of adaptive management, results of adaptive management, and any activities that are being planned, would be submitted no less frequently than every other year.

Anticipated Near-Term Restoration Actions

The Hill Slough parcel in the Marsh is currently owned by the Principals and would likely be restored upon implementation of the SMP. The parcel comprises approximately 950 acres and would contribute to the total restoration acres for whichever alternative is selected. Although many of the potential impacts of restoration of this site are included in this EIS/EIR, a separate notice of determination and/or record of decision will be made if and when a decision to restore this area is made.

Impacts and Mitigation Measures

For the most part, the SMP components would be implemented in a way that helps mitigate impacts before or as they occur. However, four significant and unavoidable impacts were identified related to disturbance to cultural resources. Table ES-5, at the end of this summary, summarizes the impacts identified in the EIS/EIR.

Environmental Commitments

As part of the plan implementation, individual project proponents will incorporate certain environmental commitments and BMPs into specific projects to avoid or minimize potential impacts as applicable. Project proponents and the appropriate agencies also will coordinate planning, engineering, and design phases of the project. The environmental commitments are divided between Restoration Activities and Managed Wetland Activities. For restoration activities, project proponents are defined as any state, federal or local agency, landowner, or implementing body of a restoration action. For managed wetland activities, the SMPA Agencies (SRCD, DFG, DWR, and/or Reclamation) are the project proponents and will be responsible for implementing the environmental commitments, depending on the activity.

Restoration Activities

- implementation of BMPs, avoidance and minimization measures, and BO terms and conditions;
- implementation of stormwater pollution prevention plan and erosion and sediment control plan;
- compliance with Solano County's noise ordinance;
- implementation of traffic and navigation control plan and emergency access plan;
- implementation of Mosquito Abatement BMPs;

- implementation of hazardous materials management plan;
- implementation of air quality BMPs;
- cultural resources Native American graves protection;
- environmental awareness worker training;
- construction period restrictions;
- special-status wildlife protection through surveys, buffers, and monitoring;
- implementation of construction period restrictions; and
- nonnative plant control.

Managed Wetland Activities

- continuation of existing BMPs and BO terms and conditions,
- construction period restrictions,
- dredging practices to minimize impacts on the aquatic environment,
- implementation of hazardous materials management plan,
- cultural resources Native American graves protection, and
- environmental awareness worker training.

Public Involvement and Next Steps

Development of the SMP has been a multi-agency, collaborative process in an effort to design a plan to balance the various resources in the Marsh. Throughout the process, Principal Agencies (DFG, Reclamation, USFWS, NMFS, SRCD, DWR, and CALFED) have cooperated to develop the various components of the plan. Additionally, landowners in the Marsh and other agencies that have a jurisdictional or other stake in the outcome of the SMP have been engaged. These agencies include the Corps, BCDC, State Water Board, RWQCB, and Solano County.

Reclamation and FWS jointly filed an NOI on November 10, 2003, and DFG filed an NOP on November 7, 2003. Both the NOI and the NOP invited the public and agencies to provide comments during the scoping period. Three scoping meetings were held, one each on November 25, 2003 in Fairfield, CA; December 4, 2003 in Benicia, California; and December 10, 2003 in Fairfield, California. The November 25 meeting was during business hours, while the other two began at 6 p.m. In total, over 150 people attended these meetings. The scoping report provides additional information about the scoping procedures and outcomes. All of these issues and concerns were considered in the development of the plan, alternatives, and/or analysis of resource impacts.

This Public Draft EIS/EIR was available for review and comment for 60 days (October 29, 2010 through December 28, 2010) following filing of the Notice of Availability (NOA) of the EIS with the EPA and the Notice of Completion (NOC) of the EIR with the California State Clearinghouse.

This Final EIS/EIR includes responses to public and agency comments (Chapter 14) and changes in the text. All of the comments received are also included in Chapter 14 of this Final EIS/EIR. A total of 17 comment letters were received. Alternative A was identified as the Preferred Alternative and DFG, USFWS, and Reclamation will issue a Notice of Determination (NOD)/Record of Decision (ROD), respectively, for the decision regarding which alternative will become the SMP to be implemented.

Expected Outcomes

Besides the NEPA and CEQA compliance efforts for the SMP, the Principals expect to obtain other environmental permits as outlined in Table ES-1. Together with the completion of the CEQA and NEPA process, these permits will allow Principal and other agencies to implement restoration in the Marsh and allow the SMPA agencies to implement managed wetland activities.

Table ES-5. Summary of Impacts and Mitigation Measures

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
WATER SUPPLY AND MANAGEMENT				
Restoration Impacts				
WTR-1: Reduction in Water Availability for Riparian Water Diversions to Managed Wetlands Upstream or Downstream of Restoration Areas	A, B, C	Less than significant	None required	–
WTR-2: Increased Tidal Velocities from Breaching of Managed Wetlands Levees	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
WTR-3: Improved Water Supply as a Result of Improved Flooding and Draining of Managed Wetlands	A, B, C	Beneficial	–	–
WTR-4: Increased Tidal Flows and Improved Water Supply as a Result of Dredging	A, B, C	Beneficial	–	–
WATER QUALITY				
Restoration Impacts				
WQ-1: Increased Salinity in Suisun Marsh Channels from Increased Tidal Flows from Suisun Bay (Grizzly Bay) as a Result of Restoration	A, B, C	Less than significant	None required	–
WQ-2: Changes to Salinity of Water Available for Managed Wetlands from October to May	A, B, C	Less than significant	None required	–
WQ-3: Increased Salinity at Delta Diversions and Exports	A, B, C	Less than significant	None required	–
WQ-4: Possible Changes to Methylmercury Production and Export as a Result of Tidal Restoration	A, B, C	Less than significant	None required	–
WQ-5: Improved Dissolved Oxygen Concentrations in Tidal Channels from Reduced Drainage of High Sulfide Water from Managed Wetlands	A, B, C	Beneficial	None required	–
WQ-6: Temporary Changes in Water Quality during Construction Activities	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Managed Wetland Activities Impacts				
WQ-7: Temporary Degradation of Water Quality during Implementation of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WQ-8: Temporary Degradation of Water Quality during Dredging, Including Possible Increases in Mercury Concentrations	A, B, C	Less than significant	None required	–
GEOLOGY AND GROUNDWATER				
Restoration Impacts				
GEO-1: Potential to Create Unstable Cut or Fill Slopes	A, B, C	Less than significant	None required	–
GEO-2: Potential for Accelerated Soil Erosion	A, B, C	Beneficial or Less than significant	None required	–
GEO-3: Potential Loss of Topsoil Resources	A, B, C	Less than significant	None required	–
GEO-4: Reduction in Availability of Non-Fuel Mineral Resources	A, B, C	Less than significant	None required	–
GEO-5: Reduction in Availability of Natural Gas Resources	A, B, C	Less than significant	None required	–
GW-6: Potential for Altered Salinity in Shallow Suisun Marsh Groundwater	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
GEO-1: Potential to Create Unstable Cut or Fill Slopes	A, B, C	Less than significant	None required	–
GEO-2: Potential for Accelerated Soil Erosion	A, B, C	Beneficial or Less than significant	None required	–
GEO-5: Reduction in Availability of Natural Gas Resources	A, B, C	No impact	–	–
GEO-7: Potential for Damage to Structures as a Result of Surface Fault Rupture, Groundshaking and/or Seismically Induced Ground Failure (Liquefaction)	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
GEO-8: Potential for Damage to Structures as a Result of Landslides, Including Seismically Induced Landslides	A, B, C	Less than significant	None required	–
FLOOD CONTROL AND LEVEE STABILITY				
Restoration Impacts				
FC-1: Increased Potential for Catastrophic Levee Failure and Flooding Resulting from Restoration Activities That Expose Interior Levees to Tidal Action	A, B, C	Less than significant	None required	–
FC-2: Changes in Flood Stage and Flow Capacity in Suisun Marsh Channels as a Result of Increased Tidal Prism and Flood Storage Capacity	A, B, C	Beneficial	–	–
FC-3: Temporary Decrease in Levee Stability Resulting from Construction Activities	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
FC-4: Reduction in Potential for Catastrophic Levee Failure and Flooding Resulting from Improvements in Exterior Levee Maintenance	A, B, C	Beneficial	–	–
SEDIMENT TRANSPORT				
Restoration Impacts				
ST-1: Increased Scour in Bays or Channels Upstream and Downstream of Habitat Restoration Areas	A, B, C	Less than significant	None required	–
ST-2: Deposition of Sediment in the Restored Tidal Wetlands	A, B, C	Beneficial or Less than significant	None required	–
ST-3: Changes in Regional Sedimentation and Scour Patterns in Suisun Marsh	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
ST-4: Increase in Erosion Adjacent to Dredging Sites	A, B, C	Less than significant	None required	–
ST-5: Increase in Deposition at Dredging Sites	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
TRANSPORTATION AND NAVIGATION				
Restoration Impacts				
TN-1: Temporary Addition of Vehicles to Roadway System and Alteration of Patterns of Vehicular Circulation during Construction Activities	A, B, C	Less than significant	None required	–
TN-2: Temporary Increases in Road Hazards during Construction Activities	A, B, C	Less than significant	None required	–
TN-3: Damage to Roadway Surfaces from Construction Activities	A, B, C	Less than significant	None required	–
TN-4: Impacts to Air Traffic Attributable to Restoration Activities	A, B, C	Less than significant	None required	–
TN-5: Impacts on Land Use Attributable to Restoration Activities within Travis Air Force Base Zone	A, B, C	Less than significant	None required	–
TN-6: Temporary Reduction in Boat Access during Construction Activities	A, B, C	Less than significant	None required	–
TN-7: Decrease in Rail Line Integrity and Disruption to Rail Service	A, B, C	Less than significant	None required	–
TN-8: Short-Term Reduction in Navigable Areas Resulting from Increased Velocities after Restoration Activities	A, B, C	Less than significant	None required	–
TN-9: Temporary Reduction in Boat Access during Dredging Activities	A, B, C	Less than significant	None required	–
TN-10: Increases in Navigable Areas of Suisun Marsh	A, B, C	Beneficial	–	–
TN-11: Operations and Maintenance Increase in Traffic	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
TN-1: Temporary Addition of Vehicles to Roadway System and Alteration of Patterns of Vehicular Circulation during Construction Activities	A, B, C	Less than significant	None required	–
TN-2: Temporary Increases in Road Hazards during Construction Activities	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
TN-3: Damage to Roadway Surfaces from Construction Activities	A, B, C	Less than significant	None required	–
TN-4: Impacts to Air Traffic Attributable to Restoration Activities	A, B, C	Less than significant	None required	–
TN-5: Impacts on Land Use Attributable to Restoration Activities within Travis Air Force Base Zone	A, B, C	Less than significant	None required	–
TN-6: Temporary Reduction in Boat Access during Construction Activities	A, B, C	Less than significant	None required	–
TN-7: Decrease in Rail Line Integrity and Disruption to Rail Service	A, B, C	Less than significant	None required	–
TN-9: Temporary Reduction in Boat Access during Dredging Activities	A, B, C	Less than significant	None required	–
TN-11: Operations and Maintenance Increase in Traffic	A, B, C	Less than significant	None required	–
AIR QUALITY				
AQ-1: Generation of Construction-Related Emissions in Excess of Draft BAAQMD Standards Associated with Restoration	A, B, C	Significant	AQ-MM-1: Limit Construction Activity during Restoration AQ-MM-2: Reduce Construction NO_X Emissions AQ-MM-3: Implement All Appropriate BAAQMD Mitigation Measures	Less than significant
AQ-2: Generation of Construction-Related Emissions in Excess of Draft BAAQMD Standards Associated with Current Management Activities	A, B, C	Significant	AQ-MM-2: Reduce Construction NO_X Emissions AQ-MM-3: Implement All Appropriate BAAQMD Mitigation Measures	Less than significant
AQ-3: Generation of Construction-Related Emissions in Excess of Draft BAAQMD Standards Associated with New Management Activities	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
AQ-4: Generation of Construction-Related Emissions in Excess of Draft BAAQMD Standards Associated with Restoration and Management Activities Combined	A, B, C	Significant	AQ-MM-1: Limit Construction Activity during Restoration AQ-MM-2: Reduce Construction NO_X Emissions AQ-MM-3: Implement All Appropriate BAAQMD Mitigation Measures AQ-MM-4: Limit Construction Activity during Restoration and Management	Less than significant
AQ-5: Construction-Related Diesel Health Risk Associated with Restoration	A, B, C	Less than significant	None required	–
AQ-6: Construction-Related Diesel Health Risk Associated with Current Management Activities	A, B, C	Less than significant	None required	–
AQ-7: Construction-Related Diesel Health Risk Associated with New Management Activities	A, B, C	Less than significant	None required	–
AQ-8: Construction-Related Diesel Health Risk Associated with Restoration and Management Activity Combined	A, B, C	Less than significant	None required	–
AQ-9: Increase in Construction Emissions in Excess of Federal *de Minimis* Thresholds	A, B, C	Less than significant	None required	–
AQ-10: Increase in Construction-Related Odor	A, B, C	Less than significant	None required	–
NOISE				
Restoration Impacts				
NZ-1: Temporary Increases in Ambient Noise during Construction Activities Associated with Restoration	A, B, C	Less than significant	None required	–
NZ-2: Temporary Exposure of Sensitive Land Uses to Groundborne Vibration or Noise from Construction Activities	A, B, C	Less than significant	None required	–
NZ-3: Permanent Increases in Ambient Noise	A, B, C	Less than significant	None required	–
NZ-4: Exposure of Noise-Sensitive Land Uses to Noise from Material Hauling Operations	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Managed Wetland Activities Impacts				
NZ-2: Temporary Exposure of Sensitive Land Uses to Groundborne Vibration or Noise from Construction Activities	A, B, C	Less than significant	None required	–
NZ-3: Permanent Increases in Ambient Noise	A, B, C	Less than significant	None required	–
NZ-4: Exposure of Noise-Sensitive Land Uses to Noise from Material Hauling Operations	A, B, C	Less than significant	None required	–
NZ-5: Temporary Increases in Ambient Noise during Construction Activities Associated with Management Activities	A, B, C	Less than significant	None required	–
NZ-6: Exposure of Noise-Sensitive Land Uses to Noise from Portable Pump Operations	A, B, C	Significant	NZ-MM-1: Limit Noise from Pump Operations	Less than significant
CLIMATE CHANGE				
CC-1: Construction-Related Changes in Greenhouse Gas Emissions	A, B, C	Less than significant	None required	–
CC-2: Permanent Changes in Greenhouse Gas Sources and Sinks	A, B, C	Beneficial	None required	–
CC-3: Degradation of Wetland Habitat and Ecosystem Health as a Result of Inundation Associated With Sea Level Rise	No Action Alternative	–	–	
CC-3: Degradation of Wetland Habitat and Ecosystem Health as a Result of Inundation Associated With Sea Level Rise	A, B, C	Beneficial	None required	–
FISH				
Restoration Impacts				
FISH-1: Construction-Related Temporary Impairment of Fish Survival, Growth, and Reproduction by Accidental Spills or Runoff of Contaminants (Heavy Metals)	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
FISH-2: Construction-Related Temporary Reduction of Special-Status Fish Rearing Habitat Quality or Quantity through Increased Input and Mobilization of Sediment	A, B, C	Less than significant	None required	–
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	A, B, C	Less than significant	None required	–
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	A, B, C	Less than significant	None required	–
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	A, B, C	Less than significant	None required	–
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	A, B, C	Less than significant	None required	–
FISH-7: Short-Term Impairment of Sacramento Splittail Passage and Reduced Availability of Rearing Habitat Resulting from Changes in Velocity Attributable to Restoration Activities	A, B, C	Less than significant	None required	–
FISH-8: Short-Term Impairment of Longfin Smelt Passage and Reduced Availability of Rearing Habitat Resulting from Changes in Velocity Attributable to Restoration Activities	A, B, C	Less than significant	None required	–
FISH-9: Temporary Reduction of Delta Smelt Habitat Quantity or Quality through Removal and Destruction of Cover Attributable to Restoration Activities	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
FISH-10: Temporary Reduction of Chinook Salmon Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-11: Temporary Reduction of Steelhead Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-12: Temporary Reduction of Green Sturgeon Habitat Quantity or Quality as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-13: Temporary Reduction of Sacramento Splittail Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-14: Temporary Reduction of Longfin Smelt Habitat Quantity or Quality through Removal and Destruction of Cover as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-15: Improved Fish Habitat Due to Increased Dissolved Oxygen Concentrations in Tidal Channels Attributable to Restoration Activities	A, B, C	Beneficial	None required	–
FISH-16: Salinity–Related Reduction of Delta Smelt Survival, Growth, Movement, or Reproduction Attributable to Restoration Activities	A, B, C	Less than significant	None required	–
FISH-17: Salinity–Related Reduction of Chinook Salmon Survival, Growth, or Movement as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-18: Salinity–Related Reduction of Steelhead Survival, Growth, or Movement as a Result of Restoration Activities	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
FISH-19: Salinity–Related Reduction of Green Sturgeon Survival, Growth, or Movement as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-20: Salinity–Related Reduction of Sacramento Splittail Survival, Growth, Movement, or Reproduction as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-21: Salinity–Related Reduction of Longfin Smelt Survival, Growth, Movement, or Reproduction as a Result of Restoration Activities	A, B, C	Less than significant	None required	–
FISH-22: Disturbance, Injury, or Mortality of Individual Fish Resulting from Work Adjacent to Bodies of Water	A, B, C	Less than significant	None required	–
FISH-23: Change in Fish Species Composition Attributable to Changes in Salinity or Water Quality from Managed or Natural Wetland Modifications	A, B, C	Less than significant	None required	–
FISH-24: Change in Benthic Macroinvertebrate Composition Attributable to Changes in Channel Morphology and Hydraulics as a Result of Tidal Restoration	A, B, C	Less than significant	None required	–
FISH-25: Change in Primary Productivity as a Result of Tidal Restoration	A, B, C	Beneficial	–	–
Managed Wetland Activities Impacts				
FISH-26: Construction-Related Temporary Impairment of Fish Survival, Growth, and Reproduction by Accidental Spills or Runoff of Contaminants (Heavy Metals)	A, B, C	Less than significant	None required	–
FISH-27: Construction-Related Temporary Reduction of Fish Rearing Habitat Quality or Quantity through Increased Input and Mobilization of Sediment	A, B, C	Less than significant	None required	–
FISH-28: Construction-Related Mortality of Fish from Stranding	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
FISH-29: Temporary Reduction of Delta Smelt, Chinook Salmon and Steelhead Habitat Quantity or Quality Attributable to Management Activities	A, B, C	Less than significant	None required	–
FISH-30: Temporary Reduction of Green Sturgeon Habitat Quantity or Quality as a Result of Management Activities	A, B, C	Less than significant	None required	–
FISH-31: Temporary Reduction of Sacramento Splittail Habitat Quantity or Quality as a Result of Management Activities	A, B, C	Less than significant	None required	–
FISH-32: Temporary Reduction of Longfin Smelt Habitat Quantity or Quality as a Result of Management Activities	A, B, C	Less than significant	None required	–
FISH-33: Reduction in Benthic Macroinvertebrate Abundance as a Result of Dredging	A, B, C	Less than significant	None required	–
FISH-34: Disturbance, Injury, or Mortality of Delta Smelt Resulting from Dredging	A, B, C	Less than significant	None required	–
FISH-35: Disturbance, Injury, or Mortality of Chinook Salmon Resulting from Dredging	A, B, C	Less than significant	None required	–
FISH-36: Disturbance, Injury, or Mortality of Steelhead Resulting from Dredging	A, B, C	Less than significant	None required	–
FISH-37: Disturbance, Injury, or Mortality of Green Sturgeon Resulting from Dredging	A, B, C	Less than significant	None required	–
FISH-38: Disturbance, Injury, or Mortality of Sacramento Splittail Resulting from Dredging	A, B, C	Less than significant	None required	–
FISH-39: Disturbance, Injury, or Mortality of Longfin Smelt Resulting from Dredging	A, B, C	Less than significant	None required	–
FISH-40: Reduction of Fish Habitat Quantity or Quality Resulting from Installation of New Riprap on Levees	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
VEGETATION AND WETLANDS				
Restoration Impacts				
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	A, B, C	Less than significant	None required	–
VEG-2: Loss or Degradation of Tidal Wetlands Adjacent to Restoration Sites as a Result of Levee Breaching/Grading	A, B, C	Less than significant	None required	–
VEG-3: Loss of Managed Wetlands as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
VEG-4: Loss of Upland Plant Communities and Associated Seasonal Wetland Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
VEG-5: Spread of Noxious Weeds as a Result of Restoration Construction	A, B, C	Less than significant	None required	–
VEG-6: Loss of Special-Status Plants or Suitable Habitat as Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
VEG-7: Degradation of Native Plant Species and Spread of Invasive Plant Species as a Result of Increased Public Access	A, B, C	Less than significant	None required	–
VEG-8: Loss or Degradation of Tidal Native Plant Species and Spread of Invasive Plant Species as a Result of Tidal Muting	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
VEG-9: Loss of Special-Status Plants or Suitable Habitat as Result of Exterior Levee Activities	A, B, C	Less than significant	None required	–
VEG-10: Loss or Degradation of Wetland Communities and Special-Status Plant Species in Slough Channels as a Result of Channel Dredging	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
VEG-1: Loss or Degradation of Rare Natural Communities and Special-Status Plant Species as a Result of New Fish Screen Facilities	A, B, C	Less than significant	None required	–
VEG-12: Loss or Disturbance of Managed Wetlands as a Result of Activities within Managed Wetlands	A, B, C	Less than significant	None required	–
VEG-13: Loss or Disturbance of Tidal Wetlands or Other Waters of the United States and Special-Status Plant Species as a Result of Placement of New Riprap and Alternative Bank Protection Methods	A, B, C	No impact	–	–
VEG-14: Loss or Disturbance of Wetlands and Special-Status Plant Species as a Result of DWR/Reclamation Facility Maintenance Activities	A, B, C	Less than significant	None required	–
VEG-15: Introduction or Spread of Noxious Weeds as Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILDLIFE				
Restoration Impacts				
WILD-1: Loss or Disturbance of Salt Marsh Harvest Mouse Suitable Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-2: Loss or Disturbance of California Clapper Rail Suitable Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-3: Loss or Disturbance of California Black Rail Suitable Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-4: Loss or Disturbance of Suisun Shrew Suitable Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-5: Loss or Disturbance of California Least Tern Suitable Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
WILD-6: Loss of Suisun Song Sparrow and Salt Marsh Common Yellowthroat Suitable Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-7: Loss or Disturbance of Raptor Nest Sites or Foraging Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-8: Loss or Disturbance of Western Pond Turtle as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-9: Loss or Disturbance of Tricolored Blackbird as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
WILD-10: Effects on Southern Resident Killer Whales as a Result of Changes in Salmon Populations	A, B, C	Less than significant	None required	–
WILD-11: Loss or Disturbance of Waterfowl and Shorebird Habitat as a Result of Tidal Wetland Restoration	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
WILD-12: Loss or Disturbance of Salt Marsh Harvest Mouse Suitable Habitat as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-13: Loss or Disturbance of California Clapper Rail Suitable Habitat as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-14: Loss or Disturbance of California Black Rail Suitable Habitat as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-15: Loss or Disturbance of Suisun Shrew Suitable Habitat as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
WILD-16: Loss or Disturbance of California Least Tern Suitable Habitat as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-17: Loss or Disturbance of Suisun Song Sparrow and Salt Marsh Common Yellowthroat Suitable Habitat as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-18: Loss or Disturbance of Raptor Nest Sites or Foraging Habitat as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-19: Loss or Disturbance of Western Pond Turtle as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-20: Loss or Disturbance of Tricolored Blackbird as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-21: Effects on Southern Resident Killer Whales as a Result of Changes in Salmon Populations as a Result of Managed Wetland Activities	A, B, C	Less than significant	None required	–
WILD-22: Changes in Waterfowl Nesting and Wintering Habitat as a Result of Marsh Management Activities	A, B, C	Beneficial	–	–
WILD-23: Changes in Shorebird Nesting and Wintering Habitat as a Result of Marsh Management Activities	A, B, C	Beneficial	–	–
LAND AND WATER USE				
Restoration Impacts				
LU-1: Alteration of Existing Land Use Patterns	A, B, C	Less than significant	None required	–
LU-2: Conflict with Existing Land Use Plans, Policies, and Regulations	A, B, C	No impact	–	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
LU-3: Conflict with Any Applicable Habitat Conservation Plan or Natural Community Conservation Plan	A, B, C	No impact	–	–
Managed Wetland Activities Impacts				
LU-1: Alteration of Existing Land Use Patterns	A, B, C	Less than significant	None required	–
LU-2: Conflict with Existing Land Use Plans, Policies, and Regulations	A, B, C	No impact	–	–
LU-3: Conflict with Any Applicable Habitat Conservation Plan or Natural Community Conservation Plan	A, B, C	No impact	–	–
SOCIAL AND ECONOMIC CONDITIONS				
Restoration Impacts				
SOC-1: Change in Employment and Income Resulting from Construction, Restoration, and Other Expenditures	A, B, C	Beneficial	–	–
SOC-2: Changes in Employment and Income Resulting from Changes in Managed Wetland–Related Recreation Opportunities and Use	A, B, C	Beneficial	–	–
SOC-3: Changes in Property Tax Revenues as a Result of Purchasing and Restoring Private Lands	A, B, C	Less than significant	–	–
Managed Wetland Activities Impacts				
SOC-1: Change in Employment and Income Resulting from Construction Restoration, and Other Expenditures	A, B, C	Beneficial	–	–
SOC-2: Changes in Employment and Income Resulting from Changes in Managed Wetland–Related Recreation Opportunities and Use	A, B, C	Beneficial	–	–
SOC-4: Changes in Employment and Income Resulting from Increased Expenditures for Wetland Management Activities	A, B, C	Less than significant	–	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
UTILITIES AND PUBLIC SERVICES				
Restoration Impacts				
UTL-1: Damage to Pipelines and/or Disruption of Electrical, Gas, or Other Energy Services during Construction or Restoration Activities	A, B, C	Significant	UTL-MM-1: Relocate Overhead Powerlines or other Utilities that Could be Affected by Construction UTL-MM-2: Avoid Ground-Disturbing Activities within Pipeline Right-of-Way	Less than significant
UTL-2: Damage to Utility Facilities or Disruption to Service as a Result of Restoration	A, B, C	Significant	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	Less than significant
UTL-3: Reduction in Capacity of Local Solid Waste Landfills	A, B, C	Less than significant	None required	–
UTL-4: Increase in Emergency Service Response Times	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
UTL-3: Reduction in Capacity of Local Solid Waste Landfills	A, B, C	Less than significant	None required	–
UTL-4: Increase in Emergency Service Response Times	A, B, C	Less than significant	None required	–
UTL-5: Damage to Pipelines and/or Disruption of Electrical, Gas, or Other Energy Services during Dredging	A, B, C	Significant	UTL-MM-2: Avoid Ground-Disturbing Activities within Pipeline Right-of-Way	Less than significant
POWER PRODUCTION AND ENERGY				
Restoration Impacts				
POW-1: Substantial Temporary Increase in Energy Use during Construction and Restoration Activities	A, B, C	Less than significant	None required.	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Managed Wetland Activities Impacts				
POW-2: Substantial Temporary Increase in Energy Use during Managed Wetland Activities	A, B, C	Less than significant	None required.	–
VISUAL/AESTHETIC RESOURCES				
Restoration Impacts				
VIS-1: Temporary Changes in Views Caused by Construction Activities	A, B, C	Less than significant	None required	–
VIS-2: Temporary Changes in Views Caused by Habitat Reestablishment Period	A, B, C	Less than significant	None required	–
VIS-3: Changes in Views to and from Suisun Marsh	A, B, C	Less than significant	None required	–
VIS-4: Damage to Scenic Resources along Scenic Highway	A, B, C	No impact	–	–
VIS-5: Create a New Source of Light and Glare That Affects Views in the Area	A, B, C	Less than significant	None required	–
VIS-6: Conflict with Policies or Goals Related to Visual Resources	A, B, C	No impact	–	–
Managed Wetland Activities Impacts				
VIS-1: Temporary Changes in Views Caused by Construction Activities	A, B, C	Less than significant	None required	–
VIS-3: Changes in Views to and from Suisun Marsh	A, B, C	Less than significant	None required	–
VIS-4: Damage to Scenic Resources along Scenic Highway	A, B, C	No impact	–	–
VIS-5: Create a New Source of Light and Glare That Affects Views in the Area	A, B, C	Less than significant	None required	–

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
VIS-6: Conflict with Policies or Goals Related to Visual Resources	A, B, C	No impact	–	–
CULTURAL RESOURCES				
Restoration Impacts				
CUL-1: Damage to Montezuma Slough Rural Historic Landscape and Mein's Landing as a Result of Ground-Disturbing Activities along Montezuma Slough	A, B, C	Significant	CUL-MM-1: Document and Evaluate the Montezuma Slough Rural Historic Landscape, Assess Impacts, and Implement Mitigation Measures to Lessen Impacts	Significant and unavoidable
CUL-2: Damage to or Destruction of Other Known Cultural Resources as a Result of Ground-Disturbing Activities in Lowland and Marsh Areas	A, B, C	Significant	CUL-MM-2: Evaluate Previously Recorded Cultural Resources and Fence NRHP- and CRHR-Eligible Resources prior to Ground-Disturbing Activities	Less than significant
CUL-3: Damage to Known Cultural Resources as a Result of Inundation	A, B, C	Significant	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	Significant and unavoidable
CUL-4: Inadvertent Damage to or Destruction of As-Yet-Unidentified Cultural Resources as a Result of Ground-Disturbing Activities in Restoration Areas	A, B, C	Significant	CUL-MM-5: Conduct Cultural Resource Inventories and Evaluations and Resolve Any Adverse Effects	Significant and unavoidable
CUL-5: Damage to or Destruction of Human Remains as a Result of Ground-Disturbing Activities	A, B, C	Less than significant	None required	–
Managed Wetland Activities Impacts				
CUL-6: Damage to or Destruction of Shipwrecks or Other Submerged Resources as a Result of Channel Dredging	A, B, C	Significant	CUL-MM-6: Stop Ground-Disturbing Activities, Evaluate the Significance of the Discovery, and Implement Mitigation Measures as Appropriate	Less than significant

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
CUL-7: Damage to or Destruction of Known Cultural Resources Resulting from Managed Wetland Activities	A, B, C	Significant	CUL-MM-7: Complete NHPA Section 106 Consultation and Prepare and Implement Context Study; Evaluate Previously Recorded Cultural Resources and Fence NRHP- and CRHR-Eligible Cultural Resources prior to Ground-Disturbing Activities	Less than significant
CUL-8: Damage to or Destruction of As-Yet-Unidentified Cultural Resources in Uninspected Areas as a Result of Other Ground-Disturbing Managed Wetland Activities	A, B, C	Significant	CUL-MM-8: Complete NHPA Section 106 Consultation and Prepare and Implement Context Study; Conduct Cultural Resources Inventories and Evaluations and Resolve Any Adverse Effects	Significant and unavoidable
PUBLIC HEALTH AND ENVIRONMENTAL HAZARDS				
Restoration Impacts				
HAZ-1: Increased Risk of Mosquito-Borne Diseases	A, B, C	Less than significant	None required	–
HAZ-2: Exposure to or Release of Hazardous Materials during Construction	A, B, C	Less than significant	None required	–
HAZ-3: Release of Hazardous Materials into Surrounding Water Bodies during Construction	A, B, C	Less than significant	None required	–
HAZ-4: In-Channel Construction-Related Increase in Emergency Response Times	A, B, C	Less than significant	None required	–
HAZ-5: Increased Human and Environmental Exposure to Mercury	A, B, C	Less than significant	None required	–
HAZ-6: Reduction in Potential for Catastrophic Flooding	A, B, C	Beneficial	–	–
HAZ-7: Increased Human and Environmental Exposure to Natural Gas and Petroleum	A, B, C	Significant	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	Less than significant

Impact	Alternative	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Managed Wetland Activities Impacts				
HAZ-2: Exposure to or Release of Hazardous Materials during Construction	A, B, C	Less than significant	None required	–
HAZ-4: In-Channel Construction-Related Increase in Emergency Response Times	A, B, C	Less than significant	None required	–
HAZ-5: Increased Human and Environmental Exposure to Mercury	A, B, C	Less than significant	None required	–
HAZ-6: Reduction in Potential for Catastrophic Flooding	A, B, C	Beneficial	–	–
ENVIRONMENTAL JUSTICE				
Restoration Impact				
EJ-1: Disproportionate Impact of Management of Suisun Marsh on Minority and/or Low-Income Communities	A, B, C	No impact	–	–
Managed Wetland Activities Impact				
EJ-1: Disproportionate Impact of Management of Suisun Marsh on Minority and/or Low-Income Communities	A, B, C	No impact	–	–
INDIAN TRUST ASSETS				
No Impacts				