CHIPPS ISLAND TIDAL HABITAT RESTORATION PROJECT

DELTA PLAN CERTIFICATION OF CONSISTENCY

SECTION 2 - COVERED ACTION PROFILE

1. SectionD_CoveredAction_Summary

0 PROJECT DESCRIPTION

0.1 Introduction

Consistent with the Delta Plan and all relevant Delta Plan Policies, the California Department of Water Resources (DWR) is planning tidal restoration of a combined 910 acres at Chipps Island (Restoration Project) within the eastern Suisun Marsh (Figure 1-1), one of the six Priority Habitat Restoration Areas that the Delta Plan states that California agencies "must . . . protect" because they "present opportunities to reestablish land-water connections" and "present the most promising restoration opportunities" within the Delta. The Restoration Project is within a priority area in the 2008 United States Fish and Wildlife Service (USFWS) Biological Opinion Delta Smelt Crediting Decision Model (USFWS, 2008).

The Restoration Project will restore tidal connection with interior portions of the marsh plain to promote the exchange of water, nutrients, fish food, and sediment, providing valuable nutrients to sustain the marsh and its valuable habitat for sensitive and special-status species. The goal of the Restoration Project is to benefit native fish species by restoring unrestricted tidal connectivity to the interior of Chipps Island and to create open water and tidal wetland habitats on the site. The Proposed Project includes the following objectives, which are consistent with all Delta Plan Polices and with the Delta Plan as a whole:

- Enhance habitat appropriate for rearing salmonids, Delta Smelt, Longfin Smelt, and other native fish species
- Enhance available productivity for native fish within and adjacent to the restoration site
- Provide connectivity to the marsh plain

Returning the Project Site to natural tidal influence would restore previously inaccessible managed marsh into rearing and/or food production habitat for Delta smelt (Hypomesus transpacificus) (Federally Threatened/California Endangered), longfin smelt (Spirinchus thaleichthys) (Candidate for federal listing/California Threatened), North American Green Sturgeon (Acipenser medirostris) (Federally Threatened), and salmonids including Central Valley DPS steelhead (Oncorhynchus mykiss) (Federally Threatened), Central California coast DPS steelhead (Oncorhynchus mykiss) (Federally Threatened), and multiple ESUs of Chinook Salmon (Oncorhynchus tshawytscha): Sacramento River winter-run Chinook Salmon (Federally Endangered/State Endangered), Central Valley

spring-run Chinook Salmon (Federally Threatened/State Threatened), and Central Valley fall-/late fall-run Chinook Salmon (California species of concern).

The Restoration Project would contribute to meeting the purpose and objectives of the Suisun Marsh Habitat Management, Preservation, and Restoration Plan, referred to as the Suisun Marsh Plan (SMP), and is consistent with the evaluation in the SMP Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

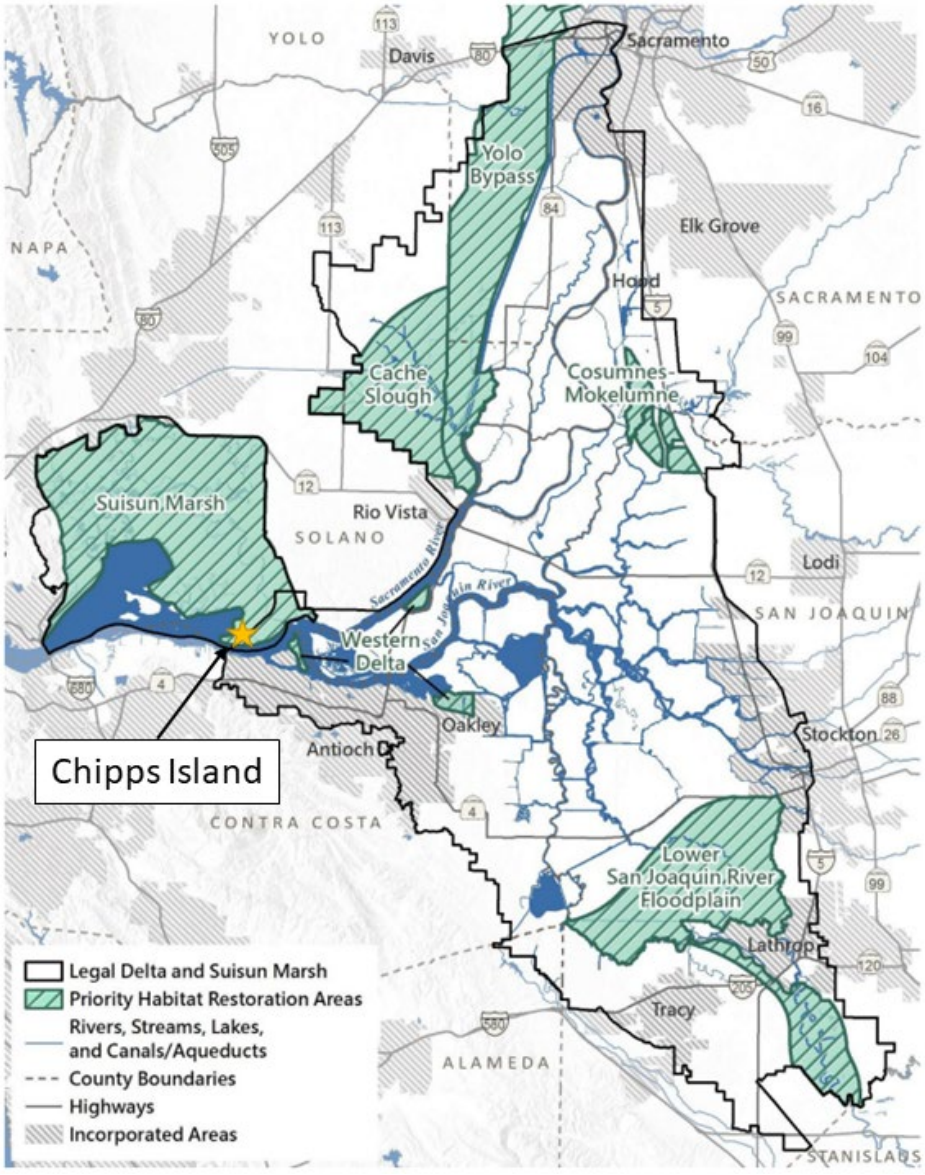

Figure 1-1. Chipps Island location within the Priority Habitat Restoration Areas of the Delta Plan (pp. 4-49; Figure 4-7 of the Delta Plan).

0.2 Project Location

Located in the southeastern edge of Suisun Marsh, in Solano County, California, Chipps Island is within the southeastern portion (Region 4) of the Suisun Marsh Plan (SMP). The Restoration Project is bordered by Honker Bay to the west, the Sacramento River to the south, and Spoonbill Creek to the northeast. The nearest public boat ramp is located at the Pittsburg Marina to the south, and the nearest land to Chipps Island is Van Sickle Island across Spoonbill Creek.

0.3 Project Site Background and Ongoing Site Management

The Restoration Project will transition Chipps Island from an area previously managed for seasonal waterfowl hunting to an area prioritized for wildlife habitat and maintained under a conservation easement. As shown in Figure 1-2, Chipps Island is composed of three separate parcels, historically managed as individual duck clubs: the north parcel (#915 – Chipps Island Shoot and Social Club) with approximately 362-acres of diked waterfowl hunting area with seasonal and permanent non-tidal wetlands; the east parcel (#910 – Dante Farms) with approximately 303-acres of tidal marsh with some tidal connectivity through culverts and openings in the levees; and the west parcel (#914, formerly owned by Metropolitan Water District) with approximately 243-acres of tidal marsh with tidal connectivity though eroded levees. All parts of the island have been used historically for waterfowl hunting and contain permanent sloughs, ponds, and ditches.

Consistent with relevant Delta Plan Policies and permitted management practices of historic duck club uses, DWR has and continues to undertake interim management activities within the managed wetlands and perimeter levees of the north parcel. Activities covered by the existing US Army Corps of Engineering (USACE) Section 404 Regional General Permit 3, Permit Number SPN-2012-00258 (RGP3) include localized repair of eroded levee locations, removal and/or repair of WCSs and bulkheads, clearing of existing interior ditches, treatment and removal of invasive vegetation, and ongoing water management (flooding, draining, and/or circulation).

0.4 Project Goals and Objectives

As noted above, the goal of the Restoration Project is to benefit native fish species by restoring unrestricted tidal connectivity to the interior of Chipps Island and to create open water and tidal wetland habitats on the site. The Restoration Project includes the following objectives, which are consistent with relevant Delta Plan Policies and with the SMP:

- ► Enhance habitat appropriate for rearing salmonids, Delta Smelt, Longfin Smelt, and other native fish species
- ► Enhance available productivity for native fish within and adjacent to the restoration site
- ► Provide connectivity to the marsh plain

In addition, the Restoration Project is consistent with the restoration activities recommended by Chapter 4 of the Delta Plan and analyzed in the SMP and the environmental evaluations in the SMP EIS/EIR. Tables 1-1 and 1-2 summarize the consistency of the Restoration Project with the Delta Plan's Five Core Strategies and the SMP's purpose and objectives, respectively.

Table 1-1. Restoration Project Consistency with the Delta Plan's Five Core Strategies

Delta Plan Core Strategies	Restoration Project
Create more natural, functional flows	The Restoration Project would restore natural tidal connectivity and hydrologic processes to approximately 362 acres of existing managed wetland habitat, including an increase of approximately 23 acres of subtidal habitat. An additional 546 acres of existing muted and tidal wetland would be preserved and enhanced by breaching exterior levees to restore historic tidal connectivity.
Restore ecosystem function	The Restoration Project has been designed to restore ecosystem function across the entire site. Ecosystem functions include the production and export of fish food and habitat for fish and wildlife.
Protect land for restoration and safeguard against land loss	Following restoration, DWR will preserve and protect the Project Site in perpetuity. The Restoration Project is a DWR FRPA Project, therefore, funding for full implementation of the restoration, maintenance and adaptive management activities, and monitoring is guaranteed in perpetuity.
Protect native species and reduce the impact of nonnative invasive species	The Restoration Project would restore approximately 362 acres and preserve

Delta Plan Core Strategies	Restoration Project
	and enhance 546 acres of tidal marsh habitat to benefit native fish, wildlife, and vegetation communities. Additionally, it has been designed to limit non-native and invasive species from further establishing on site and will implement an Invasive Vegetation Management Plan.
Improve institutional coordination to support implementation of ecosystem protection, restoration, and enhancement	The Restoration Project design has been refined through collaboration with multiple agencies, entities, scientists, and technical experts. Project planning was informed by regular meetings with multiple technical experts, including the Adaptive Management Advisory Team to help achieve objectives and implement ecosystem protection, restoration, enhancement, and adaptive management.

Table 1-2. Restoration Project Consistency with Suisun Marsh Plan Purpose and Objectives.

Suisun Marsh Plan Purpose and Objectives	Restoration 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 Restoration Project would restore approximately 362 acres of tidal marsh 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 Restoration Project would maintain the heritage of waterfowl hunting. Tidal areas below the ordinary high-water mark are public access areas.
Levee System Integrity-Maintain and improve the Suisun Marsh levee system integrity to protect property,	The Restoration Project design has been modeled to avoid potentially adverse effects, such as erosion, on

Suisun Marsh Plan Purpose and Objectives	Restoration Project
infrastructure, and wildlife habitats from catastrophic flooding.	the integrity of levees bordering Van Sickle Island along Spoonbill Creek.
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 Restoration Project design has been modeled to ensure no adverse changes in salinity and the protection of water quality.

In addition to achieving the Delta Stewardship Council's goals set forth in Chapter 4 of the Delta Plan and in relevant Delta Plan policies, restoration of Chipps Island would partially fulfill the 8,396-acre tidal restoration obligations of the 2010 Fish Restoration Program Agreement (FRPA), including updated requirements established under Biological Opinions by the NMFS (2019) the USFWS (2019) for Long-Term Operations of the State Water Project (SWP) and the Federal Central Valley Project (CVP). The Restoration Project would also contribute to restoration of 1,196 acres of habitat (800 acres of mesohaline habitat and 396.3 acres of tidal wetland habit) required under the CDFW (2020) Incidental Take Permit No. 2081-2019-066-00 to benefit four state listed species, including spring-run Chinook, winter-run Chinook, Delta smelt, and longfin smelt.

0.5 Description

The Restoration Project would contribute to implementation of the Delta Plan and relevant Delta Plan polices by restoring tidal hydrology to approximately 362 acres as well as preserving and enhancing approximately 546 acres of existing tidal marsh habitat on Chipps Island (Figure 1-2). To maximize achievement of the objectives described above, the Restoration Project has been developed through an iterative and collaborative process between Delta Stewardship Council staff, FRP team members, regional experts, resource agency biologists, the public, and adjacent landowners. Specifically, Delta Stewardship Council staff were engaged during multiple Expert Panel Meetings, as well Suisun Marsh Adaptive Management Advisory (AMAT) team meetings to discuss and incorporate feedback on project planning and design. Restoration planning included development and evaluation of ten conceptual alternatives developed between September 2018 and February 2022 through a combination of best professional judgement informed by existing Delta Regional Ecosystem

Restoration Implementation Plan and Interagency Ecological Program ecosystem conceptual models (DRERIP, IEP), hydrodynamic modeling (RMA 2022), GIS analyses, and preliminary design calculations. The selected alternative, previously referred to as Option 1C in RMA (2022) is shown in Figure 1-2 below.

Figure 1-2. Restoration Project

The Restoration Project would deepen several existing drainage ditches as well as create new channels in a meandering channel form, increasing channel edge habitat and complexity to mimic natural tidal channels in the Project vicinity. All channel excavation in the north parcel would be conducted while it is dewatered or through use of amphibious and low ground pressure (LGP) equipment if dewatering is not feasible. See Table 1-3 for detailed channel specifications. To accelerate development of a dendritic channel network connecting the marsh plain to the primary channels, shallow “starter” channels would be partially excavated in strategic locations. All starter channels would be 15 feet wide and range from 50-175 feet long. To encourage natural channel formation through incision and headward erosion by tidal flows, clearing and grubbing of preferred pathways may be extended from these starter channels into isolated portions of the marsh plain, as shown in Figure 1-4.

Following channel excavation, exterior levees of the north parcel would be breached in multiple locations to reintroduce full tidal exchange to the north parcel (Figure 1-2), including three breaches along Honker Bay to the west, three breaches along Spoonbill Creek to the east, a breach connecting the north and east parcels, as well as a breach connecting the north parcel to the Sacramento River to the south. Breaches would range between 25 to 75 feet at four-foot elevations, with complete breach specifications in Table 1-3. In addition to channel excavation to the interior of the west parcel, three remaining WCS in the east parcel would be removed, with one being plugged and the other two remaining unplugged to increase tidal exchange between the site interior and the surrounding waterways. Two WCS in the north parcel would be removed and remain unplugged to also increase tidal connectivity.

0.6 General Construction Methods and Activities

The Restoration Project (Figure 1-2) consists of a suite of actions to prepare the site for restoration, construct restoration features, and restore tidal action to the site. Restoration would consist of site preparation, excavation of the constructed channel network, filling of borrow pits and abandoned drainage ditches to match the existing marsh plain, planting and revegetation, breaching of interior and exterior levees, as well as long-term site management. Table 1-3 provides estimated material quantities and dimensions for the restoration activities and features of the Restoration Project. The following sections describe the methods and activities associated with the construction and long-term management of the Restoration Project.

Table 1-3. Estimated Material Quantities and Dimensions

No.	Restoration Activities and Restoration Project Features	Units	Quantities
1	Temporary Ramps and Roads		
	Ramps		
	Area	ac	0.03
	Volume of fill	cy	648
	Roads		
	Area	ac	4.89
	Volume of fill	cy	7,888
2	Excavate constructed channel network		
	Area	ac	4.96
	Excavation Volumes		
	Tapered connections at breach locations	cy	2,744
	Channel network	cy	27,435
	Channel 1	cy	7,156
	Channel 2	cy	6,933
	Channel 3	cy	2,133
		cy	333
	Channel 4	cy	2,113
	Channel 5	cy	7,467
	Channel 6	cy	1,300
	Starter channels	cy	615
	Channel Lengths		
	Channel 1	ft	1,150
	Channel 2	ft	1,950
	Channel 3	ft	600
		ft	500
	Channel 4	ft	620
	Channel 5	ft	1,200
	Channel 6	ft	450
	Channel Widths		
	Channel 1	ft	40
	Channel 2	ft	32
	Channel 3	ft	32
		ft	20
	Channel 4	ft	31
	Channel 5	ft	40
	Channel 6	ft	25
	Channel Depths		

No.	Restoration Activities and Restoration Project Features	Units	Quantities
	Channel 1	ft	6
	Channel 2	ft	4
	Channel 3	ft	4
		ft	1
	Channel 4	ft	4
	Channel 5	ft	6
	Channel 6	ft	6
3	Block or fill remnant agricultural ditches		
	Length	ft	1,860
	Area	ac	5.23
	Volume of fill (estimated)	cy	20,156
4	Remove Access Roads and Ramps		
	Area	ac	4.92
	Excavation Volume	cy	8,536
5	Remove Water Control Structures, Remove Shipping Container		
	Quantity	#	4
	Excavation Volume	ac	0.06
	Total volume of debris (hauled to landfill)	cy	2,380
6	Breach Exterior levees		
	No of Breaches	#	7
	Total Area	ac	0.12
	Excavation volume (above MHHW)	cy	1,475
	Excavation volume (below MHHW)	cy	3,824
	Breach width		
	Breach 1	ft	55
	Breach 2	ft	37
	Breach 3	ft	71
	Breach 4	ft	57
	Breach 5	ft	37
	Breach 6	ft	81
	Breach 7	ft	43
	Breach 8	ft	43

Pre-construction site preparation

Site preparation for the Restoration Project includes continued onsite water management, clearing along expected construction areas, structure removal, creation of staging and stockpile areas, and creation of interior access ramps and roads. Figure 1-3 illustrates site preparation elements and Figure 1-4 illustrates clearing areas. Additional site preparation activities are discussed below.

Figure 1-3. Site Preparation. The northern staging and stockpile area will encompass less than five acres and will be located within the larger area indicated on this map.

Figure 1-4. Clearing areas.

Dewatering and water management, for the purpose of creating suitable conditions for Restoration Project construction

Prior to tidal restoration, the interior restoration areas would be drained and/or pumped dry. To the extent feasible, passive dewatering of surface waters would rely on the existing network of drainage ditches and tidal flap-gates installed at existing WCSs. All, or portions of, the existing remnant agricultural drainage network would be cleared of vegetation and rehabilitated to improve site drainage, as needed. Temporary coffer dams created with sheet piles, earthen material, or other temporary fill may be necessary to facilitate dewatering for project construction.

Following passive dewatering during interim site management, active dewatering would be undertaken using drainage pumps installed at low points within the Restoration Project site. Temporary support platforms may be constructed using on-site soils supported by sheet piles, as necessary. As no electrical service remains to Chipps Island, all pumps would be diesel powered, or electrically powered using a diesel generator. Diesel fuel would either be stored at an on-site staging area or on a floating dock or support barge moored adjacent to Chipps Island. Once the pumps are no longer needed, the pump platform(s) would be removed, and any temporary fill material would be re-used on-site. All equipment and temporary sheet piles would be removed and transported off-site following restoration construction.

Debris and old infrastructure removal

DWR would remove and properly dispose of any man-made items, remnant infrastructure, or debris that would negatively affect the restoration sites (Figure 1-3). Debris would be dismantled on site to the extent feasible, removed, and transported to appropriately licensed waste facilities by barge and/or truck. If temporary access by construction equipment in areas supporting tidal marsh vegetation is required, marsh mats would be employed to limit damage to marsh vegetation.

Creation of temporary staging areas

The Restoration Project would create temporary staging areas for storage of materials and equipment and stockpiling required for construction (Figure 1-3). Because of challenging site access, multiple staging areas would be established in upland areas and in dewatered portions of Chipps Island and an additional staging and stockpile area would be established on the adjacent Van Sickle Island. Additional staging areas may also be established on barges set along the exterior levee. One staging and stockpile area would be located on the northern end of the island, the second on the eastern levee along Spoonbill Creek near the end of the railroad berm, and a third on the southern end of the railroad berm. An abandoned shipping container located at the southern staging area and an abandoned structure located along the staging area on Spoonbill Creek would be removed during site preparation activities.

Temporary access ramps and/or roads would be created using a combination of import and on-site materials to facilitate equipment entering and exiting Chipps Island (via Spoonbill Creek) and allow access to low elevation areas in the interior of the island. For example, portions of the northern staging area and areas within existing interior ditches may be used as a temporary soil source for creating elevated areas above MHHW as well as for the construction of temporary roads and ramps. Portions of the 3.3-mile North Parcel levee will be used as a haul route for material and equipment transportation (Figure 1-3).

Staging areas would incorporate appropriate BMPs for erosion control, including reseeding. Prior to breaching, staging areas, temporary buildings, access ramps and/or roads would be removed. Excess soil would be used to fill any remaining borrow areas along the marsh plain, placed along the existing levee berms, or at designated stockpile locations at upland elevations. Excess soils may be used to repair the staging area, access roads, and adjacent upland levee on Van Sickle Island should any damage occur from project activities to existing or better condition.

Clearing, invasive plant species removal, and native plant species restoration

Prior to ground disturbing activities, vegetation in the Restoration Project area that is unable to be removed under the interim management would be cleared (Figure 1-4). Invasive vegetation, with a focus on *Phragmites australis*, would be treated in accordance with a proposed invasive vegetation management plan IVMP (Appendix B), including herbicide recommendations by a pest control advisor (PCA).

Vegetation clearing would occur within a 25 ft buffer surrounding any areas with planned ground disturbance. Areas targeted for excavation that contain mono-specific stands of native emergent aquatic vegetation (*Schoenoplectus spp. and Typha spp.*) vegetation may serve as source material for replanting. As feasible, salvaged native vegetation would be relocated to designated nursery areas within low-lying areas within Chipps Island when feasible, with irrigation supplied by water tanks or natural hydrology.

To limit the return of invasive plant species and to promote the success of revegetated native wetland plants, DWR would continue vegetation management in accordance with a proposed invasive vegetation management plan (IVMP) provided in Appendix B, the adaptive management and monitoring plan, and the environmental commitments for the Restoration Project (Appendix A).

Excavate constructed channel network

Following site preparation, a network of tidal channels would be constructed by widening portions of the existing agricultural ditches, excavation of new channels, as well as excavation of shallow “starter” channels to enhance tidal connectivity and encourage natural formation of low order channels within the marsh plain (Figure 1-2). Soil moisture conditions and distances from staging areas would determine use of amphibious excavators, LGP or standard excavators.

The excavated channels would be constructed at approximately 2.5:1 side slope, with channel widths of approximately 40-45 ft at the marsh plain elevation (approximately 4 to 5 ft NAVD88), and channel bottom inverts generally excavated to subtidal elevations (approx. -2 ft NAVD88). Any excavated materials not used for construction of temporary ramps and staging areas or as fill materials within remnant agricultural ditches, would be side-casted within adjacent areas at intertidal elevations (5 to 6 ft NAVD88), placed along the existing levee berms, or at designated stockpile locations at upland elevations. In addition, a wood piling for water quality monitoring will be installed in Channels 2 or 3 prior to levee breaching.

Block or fill remnant agricultural ditches and borrow pits

To the extent feasible, existing agricultural drainage channels would be maintained to facilitate site drainage during construction as well as during daily low tides following restoration. Remnant agricultural ditches and borrow pits that may become tidally disconnected (i.e., ponded) during low tide would be filled with excavated on-site materials and graded to the elevation of the existing marsh plain (approx. 4 to 5 ft NAVD88) (Figure 1-2).

Planting and revegetation

Native wetland vegetation may be planted along the excavated channel network, within filled drainage ditches, and other areas providing open-water edge habitat following breaching of the exterior levees. To the extent feasible, areas for replanting of wetland vegetation would use native wetland vegetation materials salvaged from the Project Site. *Schoenoplectus* spp. and *Typha* spp. may be planted in cleared areas where higher wind fetch and erosion might occur.

Following construction, areas used for temporary nurseries would be returned to previously existing conditions. Hydro-seeding of native herbaceous species may be used for erosion control of bare soil along levee slopes. In addition, planting of native vegetation appropriate to high marsh and/or upland elevations may be conducted along levee roads and staging areas disturbed during construction. Specific locations and extents of revegetation zones, plant species composition, planting methods, and any initial irrigation requirements would be determined during final design.

To protect and promote the success of replanted native wetland vegetation, DWR would continue vegetation management in accordance with a proposed invasive vegetation management plan provided in Appendix B, the adaptive management and monitoring plan, and the environmental commitments for the Restoration Project (Appendix A).

Remove access road and ramps

Following completion of site excavation and planting, temporary access ramps, roads, and temporary staging areas would be removed and regraded to design elevations. Any land-side excavation connecting breach locations to the excavated channel network would be completed prior to removal of access roads and ramps. Excess materials would either be side casted at intertidal elevations (5-6 ft NAVD88) or transported to upland and stockpile locations.

Removal of water control structures and sunken shipping container

The Restoration Project would remove any remaining WCSs on Chipps Island timed to limit in-water work (e.g., interior WCSs removed first) as well as avoiding stranding equipment or fragmenting site access along levee roads. All parts of the WCSs would be removed with heavy machinery (e.g., excavator). WCS parts may include culverts, flashboard risers, flap/screw gates, bulkheads, and/or a wheel to control flow.

Removal of WCSs that cannot be accomplished from the land side would be done from the water side and timed to coincide or follow planned breaches during applicable in-water work windows. Removal of water control structures may require temporary access by construction equipment in areas supporting tidal marsh vegetation. When that access is required, marsh mats would be employed to limit damage to marsh vegetation.

The Restoration Project also will remove a sunken shipping container in Spoonbill Creek prior to excavation of a levee breach at this location. Removal may require a barge, and access by underwater divers to cut open the container, with sediment removed around and within the container by suction dredging and discharged to the site interior for settling. Dredging will only be done in approved in-water work windows (August 1 to November 30) and will include deployment of a silt curtain in Spoonbill Creek to minimize turbidity. Once the shipping container is empty and can be accessed safely, the container will be cut into sections for removal by crane and disposed at a local landfill.

Breach exterior levees

Excavators will be used to construct exterior breaches with widths of approximately 40–60 ft, side slopes of 2:1, and invert elevations to match the connecting excavated channels. The material excavated from the levee would be handled in one or more of

the following ways: (1) placed within the site interior near the levee breach at intertidal elevations (approx. 5–6 ft NAVD88), (2) spread on the top or interior side slopes of the levee as reinforcement, or (3) placed at upland stockpile locations.

In-water work (i.e., exterior levee breaching) would be performed from 3 hours before to 3 hours after low tide to the extent feasible to minimize impacts on fish and water quality. To allow levee breaching to continue throughout a tidal cycle, a silt curtain may be placed across the opening to reduce sedimentation and siltation into the surrounding waterways.

Stockpile stabilization and ongoing vegetation management

After completion of restoration activities, any excess material from excavation or grading would be sidecast in mounds to create bathymetric diversity at intertidal elevations or placed on the disturbed upland levee tops and other upland staging areas for future levee maintenance. After Project completion, any upland stockpile locations, if used, would be seeded, mulched, and stabilized in accordance with applicable BMPs to minimize the potential for erosion.

To successfully limit new colonization by undesirable plant species during and following restoration construction, DWR would continue vegetation management in accordance with a proposed IVMP provided in Appendix B, the adaptive management and monitoring plan, and the environmental commitments for the Restoration Project (Appendix A).

0.7 Construction Schedule, Equipment, and Labor Force

As shown in Table 1-4, Restoration Project construction is expected to be completed between January 1, 2024, and November 30, 2025, but specific construction schedules may change based on unforeseen circumstances. During waterfowl hunting season, construction may be further restricted to accommodate for safety concerns related to waterfowl hunting on nearby Van Sickle Island and surrounding waterways.

Table 1-4. Construction schedule. Construction schedule is an estimate with years subject to change.

Construction Phase	Timing	Construction Activity
Site Preparation	2024	• Dewatering and water management of north parcel • Remove abandoned infrastructure and debris • Develop temporary roads, ramps, and staging areas • Clearing and grubbing, management of invasive species • Develop nursery area for salvaged wetland plant species
Restoration Construction Activities	2024–2025	• Continue dewatering as needed • Excavate constructed channel network • Fill remnant ditches • Planting and revegetation • Remove access roads and ramps • Restore staging and stockpile areas
In-water work	2024–2025, within appropriate work windows	• Remove water control structures • Remove sunken shipping container and other in-water debris • Breach exterior levees

Construction activities listed in Table 1-4 would take place within work windows approved by NMFS, USFWS, and CDFW. Site clearing, excavation and other work interior to the north parcel may be spatially or temporally restricted based on the results of pre-construction surveys and biological monitors if nesting birds or other terrestrial special-status species are identified. Work schedules would comply with the requirements of the Migratory Bird Treaty Act (MBTA) and other applicable legislation as described in the SMP. Clearing in habitats used by salt marsh harvest mouse (vegetation above 8 inches) would only occur between one hour after sunrise and one hour before sunset.

Construction within tidally influenced areas will be limited to in water work windows (September 1–November 30) if dewatering is not feasible. Pre-project surveys for

California clapper rails and California black rails may allow work in wetland areas to begin by August 1st if springtime surveys do not indicate rails are present. All construction efforts in the east and west parcels would occur within the typical in-water work window. For open water habitats on the exterior of Chipps Island or interior areas that allow fish ingress and egress from the surrounding waterways, the applicable in-water work window for construction would be September 1st to November 30th of each year.

Table 1-5 summarizes the anticipated construction sequence, labor force, and equipment required for the Project. Construction would generally occur for 8 to 10 hours a day, 5 days a week. Temporary construction staffing would consist of approximately 4 to 12 personnel depending on the type of construction activity. Contractors will be transported to Chipps Island by watercraft from Pittsburg Marina or neighboring Van Sickle Island. Restoration of the project site would require many different equipment types as well as the potential use of amphibious and/or LGP equipment suitable for marsh operation. Conditions in the field at the time of construction would influence the type of equipment that would best be suited for the work and ultimately chosen by the construction contractor. Equipment would be delivered to the site by barge and maneuvered using tug/push boat. A floating barge would be used as an additional equipment storage and staging area. All contractors working on-site would be properly trained and certified for construction activities, including a Worker Environmental Awareness Program (WEAP) that includes training on identification of special-status plants and animals that may be encountered during construction, site specific best management practices (BMPs), and other requirements included in construction permits (e.g., SWPPP).

Table 1-5. Restoration activity timing, duration, equipment, and labor force estimates

Activity	Timing/Duration	Labor	Equipment
1. Pre-construction site preparation [1,2] Continue clearing existing agricultural ditches, dewatering, and levee repair.	June 1–Nov 30, 2024 and/or 2025: 10–30 days	Avg: 6 Max: 8	1: barge with crane 1: tug/push boat 1: floating dock 1–2: work boats 1–2: support vehicles, ATV 1–2: LGP/amphibious excavators 1–5: pumps 1–5: portable generators
Debris and old infrastructure removal	Mar 1–Nov 30, 2024 and 2025: 10–20 days	Avg: 6 Max: 8	1: barge with crane 1: tug/push boat 1: floating dock

Activity	Timing/Duration	Labor	Equipment
			1–2: work boats 1–2: support vehicles, ATV 1–2: rubber-tired backhoes 1–2: LGP/amphibious excavators 1–2: tracked mini-dumps
Temporary staging areas, roads, and ramps	Mar 1–Nov 30, 2024 and/or 2025: 10–20 days	Avg: 6 Max: 8	1: barge with crane 1: tug/push boat 1: floating dock 1-2: work boats 1–2: support vehicles, ATV 1–2: rubber-tired backhoes 1–2: LGP bulldozer 1–2: LGP/amphibious excavators
Clearing, wetland plant salvage and invasive species control	Apr 15–Nov 30, 2024 and/or 2025: 10–30 days	Avg: 4 Max: 6	1: barge with crane 1: tug/push boat 1: floating dock 1-2: work boats 1–2: support vehicles, ATV 1–2: LGP tractor with mower/disc 1–2: rubber-tired backhoes 1–2: tracked mini-dumps
2. Excavate constructed channel network [1]	Apr 15–Nov 30, 2024 or 2025: 20–60 days	Avg: 6 Max: 12	1-2: work boats 1–2: support vehicles, ATV 1–2: LGP/amphibious excavators 1–2: LGP bulldozer 1–2: tracked mini-dumps
3. Block or fill remnant agricultural ditches[1,2]	Apr 15–Nov 30, 2024 or 2025: 20–60 days	Avg: 6 Max: 10	1-2: work boats 1–2: support vehicles, ATV 1–2: LGP/amphibious excavators 1–2: rubber-tired backhoes 1–2: tracked mini-dumps
4. Planting and revegetation[1,2]	2024 or 2025: 10–30 days	Avg: 4 Max: 6	1-2: work boats 1–2: support vehicles, ATV 1–2: rubber-tired backhoes

Activity	Timing/Duration	Labor	Equipment
			1–2: tracked mini-dumps
5. Remove access roads and ramps[1,2]	Sep 1–Nov 30, 2024 and/or 2025: 5–20 days	Avg: 6 Max: 8	1-2: work boats 1–2: LGP excavators 1–2: LGP bulldozer 1–2: tracked mini-dumps
6. Remove water control structures, remove remnant pilings and in-water debris remove sunken shipping container [3]	Sep 1–Nov 30, 2024 and/or 2025: 5–20 days	Avg: 6 Max: 8	1: barge with crane 1: tug/push boat 1–2: work boats 1–2: long reach excavators
7. Breach exterior levees [3]	Sep 1–Nov 30, 2024 or 2025: 5–20 days	Avg: 6 Max: 8	1: barge with crane 1: tug/push boat 1–2: work boats 1–2: Long reach excavators
8. Stockpile stabilization[1,2]	Sep 1– Nov 30, 2024 and/or 2025: 10–20 days	Avg. 6 Max: 8	1: barge with crane 1: tug/push boat 1–2: work boats 1–2: LGP bulldozers 1–2: tracked mini-dumps 1–2: support vehicles, ATV

Notes:

1 Work may occur during the nesting bird season (February 15 through August 15), but additional mitigation measures may apply depending on species, such as clearance surveys, buffer zones around active nests or equipment type allowed.

2 Chipps Island is considered Salt Marsh Harvest Mouse Habitat, mitigation measures to avoid and minimize impacts to the species will be defined.

3 In water work allowed between August 1st and November 30th if springtime California clapper rail surveys show no rails are present, otherwise in water work limited to September 1st to November 30th.

0.8 Post-Construction Conditions

On completion of the Restoration Project, the interior portions of the north parcel would be reconnected with tidal waters from the surrounding waterways, creating new tidal wetland habitat. Estimated habitat acreage and wetland-type conversions resulting from the Restoration Project (Table 1-6) were calculated based on a digital elevation model

used in the preparation of the DWR (2019) wetland delineation as modified based upon the Restoration Project design elevations, and the following rationale regarding tidal marsh development.

Table 1-6. Changes in Habitat and Natural Community types between existing and post restoration conditions

Habitat Classification	Existing (acres)[1]	Change (acres)	Post Restoration (acres)[2]
Open Water, muted tidal	18.8	-18.8	0.0
Open Water, tidal	45.3	23.3	68.6
Tidal Wetland	491.3	276.6	767.9
Managed Wetland	285.5	-285.5	0.0
Developed/Barren	0.1	-0.1	0.0
Upland/Grassland	13.4	4.6	18.0
Total	**854.4**		**854.4**

[1] Estimates from DWR (2019)

[2] Estimates from preliminary design, and may vary during final design and as-built conditions

Under as-built conditions, the retained natural communities would initially be limited to emergent wetland vegetation remaining within intertidal habitats as well as upland/grassland habitats located along the levees and railroad berm. With the exception of areas that were actively replanted with salvaged vegetation, areas at intertidal elevations that were cleared for construction would be primarily tidal mudflat habitat, with tidal perennial aquatic (open-water) habitat limited to subtidal elevations corresponding to the excavated channel network and breaches. Within the first few years following construction, upland/grassland and tidal freshwater emergent wetland habitats on the restored site are anticipated to colonize and expand from the as-built condition. As emergent marsh vegetation establishes over time, tidal mudflats at intertidal elevations as well as open-water habitats at shallow subtidal elevations are expected to decrease from the as-built condition, with a corresponding increase in tidal freshwater emergent wetland habitat at intertidal and shallow subtidal elevations.

Based upon colonization of emergent marsh at intertidal elevations, the Restoration Project is expected to result in creation of approximately 300 acres of tidal wetland habitat and open tidal waters from areas that currently are managed (muted tidal) wetlands (Table 1-6). Approximately 490 acres of existing tidal marsh and channels on the east and west parcels would also be enhanced by increased connectivity with the north parcel as well as improved connectivity of the interior marsh plain with the surrounding waterways (Figure 1-2).

0.9 Environmental Commitments and Mitigation Measures

Applicable and appropriate environmental commitments from the SMP EIS/EIR would be incorporated into the Restoration Project; summarized in Chapter 2 of the SMP EIS/EIR. Additionally, mitigation measures from the Appendix F of the SMP EIS/EIR would be applied, as necessary, to minimize potential adverse effects of the Restoration Project. The full text of the measures and ECs are included in Appendix A.

1 LITERATURE CITED

CDFW (California Department of Fish and Wildlife). 2009. Longfin Smelt Incidental Take Permit No. 2081-2009-001-03 for State Water Project Operations.

CDFW. 2020. California Endangered Species Act Incidental Take Permit No. 2081-2019-066-00. Long-Term Operation of the State Water Project in the Sacramento San Joaquin Delta. Sacramento, CA: California Department of Fish and Game, Ecosystem Conservation Division.

Meyer, J., J. Costello, M. Mikkelsen, and N. Scher 2013 Suisun Marsh Habitat Management, Preservation, and Restoration Plan: Cultural Resource Contextual Report. Archaeological Resources, Volume I. Far Western Anthropological Research Group, Inc.

NMFS (National Marine Fisheries Service). 2019. Biological Opinion on the Long-term Operation of the Central Valley Project and State Water Project. October 21. National Marine Fisheries Service, West Coast Region.

Punnett Brothers. 1907 Chart of the Sacramento and San Joaquin Rivers: Showing all Landings to Sacramento and Stockton and Roads Leading to Them. General Chart. Punnett Brothers, San Francisco.

RMA (Resource Management Associates, Inc.). 2022. Chipps Island Tidal Habitat Restoration: Hydrodynamic, Particle Track and Salinity Modeling. Technical Memorandum. RMA, Davis, CA.

USFWS. 2019. Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project. USFWS Pacific Southwest Region. Sacramento, California.