Chapter 2
Project Description

The chapter is presented in its entirety from the Draft Environmental Impact Report (DEIR), with revisions to text presented as a strikethrough or underline. Text shown with a strikethrough has been deleted from the DEIR. Text that has been added is presented as single underlined. Deleted figures are shown with a dashed border. Added figures do not have unique formatting.

2.1 Introduction

The State Water Project (SWP) includes water, power, and conveyance systems, conveying an annual average of 2.9 million acre-feet (maf) of water. The principal facilities of the SWP are Oroville Reservoir and related facilities, San Luis Dam and related facilities, facilities in the Sacramento-San Joaquin Delta (Delta), the Suisun Marsh Salinity Control Gates (SMSCG), the California Aqueduct including its terminal reservoirs, and the North and South Bay Aqueducts. The California Department of Water Resources (DWR) holds contracts with 29 public agencies in northern, central, and southern California for water supplies from the SWP. Water stored in the Oroville facilities, along with water available in the Delta (consistent with applicable regulations) is captured in the Delta and conveyed through several facilities to SWP contractors. DWR operates the SWP to provide flood control and water for power generation, agricultural, municipal, industrial, recreational, and environmental purposes.

DWR operates of the SWP consistent with applicable laws, contractual obligations, and agreements, including the California Endangered Species Act (CESA), under which the California Department of Fish and Wildlife (CDFW) issued an Incidental Take Permit (2020 ITP, Permit No. 2081-2019-066-00) to DWR authorizing the incidental take of four CESA-listed fish species as part of DWR's otherwise lawful operation of the SWP. DWR's existing ITP authorizes incidental take of Longfin Smelt (*Spirinchus thaleichthys*), Delta Smelt (*Hypomesus transpacificus*), Sacramento River Winter-run Chinook Salmon Evolutionarily Significant Unit (ESU; *Oncorhynchus tshawytscha*), and Central Valley Spring-run Chinook Salmon ESU (*O. tshawytscha*). DWR is proposing to continue to operate the SWP and is seeking a new ITP to authorize incidental take of these four fish species. In addition, White Sturgeon (*Acipenser transmontanus*), could obtain protection under CESA as a candidate species in 2024 and may become a CESA-listed species in 2025. Therefore, DWR is also seeking to include White Sturgeon in the new ITP to conservatively prepare for the species being protected as a candidate for listing and potentially becoming CESA-listed during the duration of the ITP.

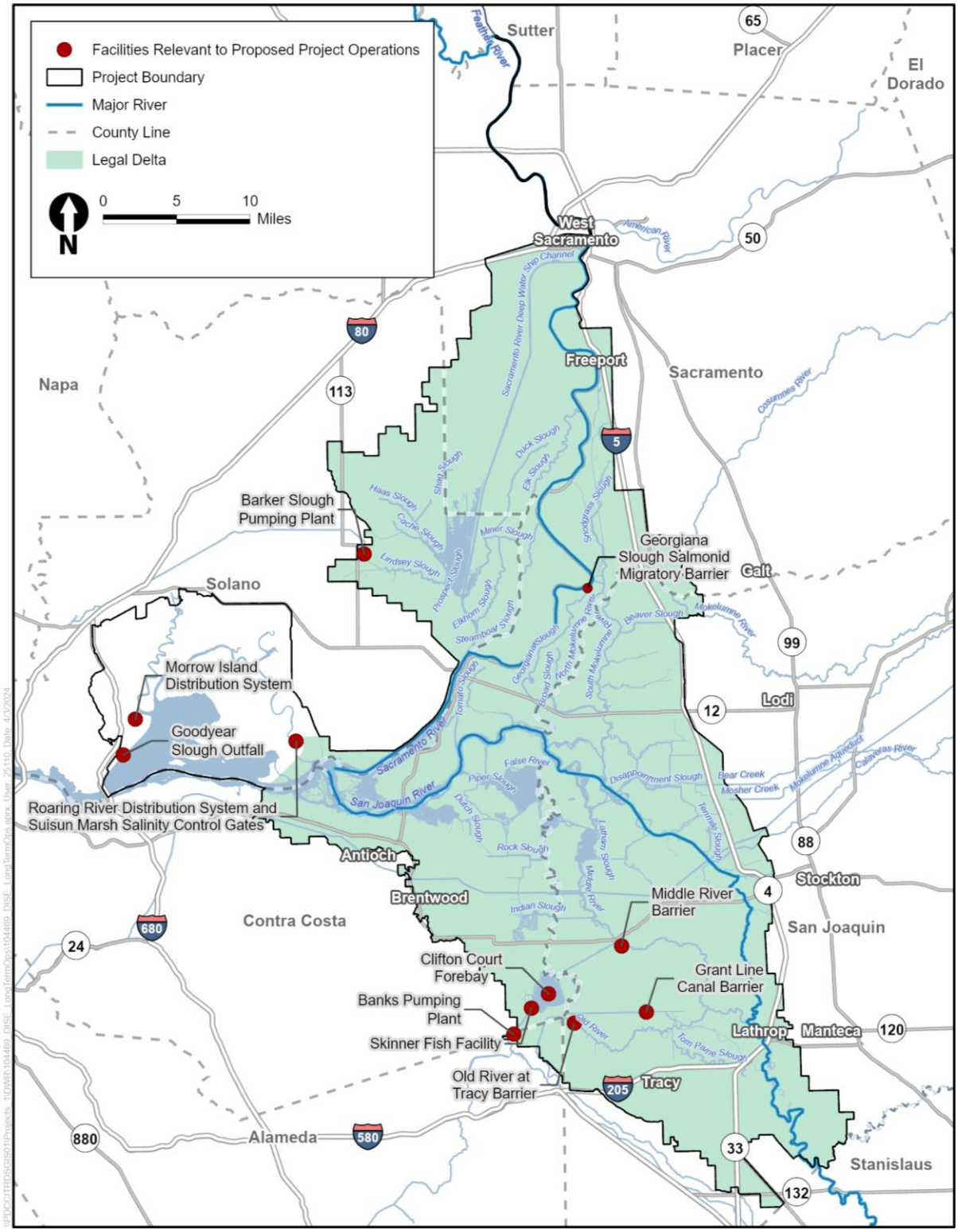
2.1.1 Project Objectives

The underlying purpose of the proposed project is to obtain incidental take authorization from the California Department of Fish and Wildlife (CDFW) pursuant to CESA for five fish species to allow DWR to continue the long-term operation of the SWP consistent with applicable laws, contractual obligations, and agreements. Consistent with this underlying purpose, DWR's project objectives are to store, divert, and convey water in accordance with DWR's existing water rights to deliver water pursuant to water contracts and agreements up to full contract quantities and to optimize water supply and improve operational flexibility while protecting fish and wildlife based on the best available scientific information.

2.1.2 Project Location

The project area is the geographic area potentially affected by the Proposed Project and includes the Sacramento River from the confluence with the Feather River to the Delta, SWP facilities in the Delta, waters of the Delta, SWP facilities in Suisun Marsh and Suisun Bay, and waters of Suisun Marsh and Suisun Bay. The rationale for including these water bodies and facilities in the geographic area potentially affected by the Proposed Project and excluding other areas is provided in Appendix 2D. Figure 2-1 shows the project area and facilities relevant to proposed project operations in the Delta, Suisun Marsh, and Suisun Bay.

DWR operates the SWP in coordination with the Central Valley Project (CVP), under the Coordinated Operations Agreement (COA) between the federal government and the State of California (authorized by Public Law 99 546). The CVP and SWP operate pursuant to water right permits and licenses issued by the State Water Resources Control Board (State Water Board). The CVP and SWP water rights allow appropriation of water by directly using the water, diverting water to storage for later withdrawal, and rediverting water to storage further downstream for later consumptive use. Requirements of the SWP and CVP to either bypass or withdraw water from storage and to help satisfy specific water quality, quantity, and operations criteria in source rivers and within the Delta are among the conditions of their water rights.



Source: Data compiled by ICF in 2022

Figure 2-1. Locations of Facilities Relevant to Proposed Project Operations in the Delta, Suisun Marsh, and Suisun Bay

2.1.3 Description of Existing Facilities Relevant to Proposed Project Operations

The SWP and joint SWP/CVP facilities in the Delta provide for delivery of water supply to areas within and immediately adjacent to the Delta, and to regions south of the Delta. The main SWP Delta features are Suisun Marsh and Bay facilities (including the SMSCG, Roaring River Distribution System [RRDS], Morrow Island Distribution System [MIDS], and Goodyear Slough Outfall [GYSO]), the Harvey O. Banks Pumping Plant (Banks Pumping Plant), the Clifton Court Forebay (CCF), the John E. Skinner Delta Fish Protective Facility (Skinner Fish Facility), and the Barker Slough Pumping Plant (BSPP). The south Delta agricultural barriers, San Luis Reservoir, and Delta Mendota Canal/California Aqueduct Intertie are joint SWP/CVP facilities.

2.1.1.1 Harvey O. Banks Pumping Plant

The Harvey O. Banks Pumping Plant (Banks Pumping Plant), located about 8 miles northwest of Tracy, marks the upstream end of the California Aqueduct. The plant discharges into five pipelines that convey water into a roughly 1-mile-long canal, which in turn conveys water to Bethany Reservoir (California Department of Water Resources and U.S. Bureau of Reclamation 2015). The Banks Pumping Plant consists of 11 pumps—two rated at 375 cubic feet per second (cfs) capacity, five at 1,130 cfs capacity, and four at 1,067 cfs capacity—that provide the initial lift of water 244 feet from the CCF into the California Aqueduct. The rated capacity of the Banks Pumping Plant is 10,300 cfs. The plant maximum daily pumping rate is controlled by a combination of the State Water Board's Decision 1641 (D-1641) and permits issued by the U.S. Army Corps of Engineers (USACE) that regulate the rate of diversion of water into the CCF, as well as restrictions on reverse flows in Old and Middle rivers to protect federal and state Endangered Species Act–listed fish species.

2.1.1.2 John E. Skinner Delta Fish Protective Facility

The Skinner Fish Facility is west of the CCF, about 2 miles (3.22 kilometers [km]) upstream from the Banks Pumping Plant. The Skinner Fish Facility guides fish away from entering the pumps that convey water into the California Aqueduct. Large fish and debris are directed away from the facility by a 388-foot-long (118-meter-long) trash boom. Smaller fish are diverted from the intake channel into bypasses by a series of metal louvers. These smaller fish pass through a secondary system of screens, louvers, and pipes into seven holding tanks, where a subsample is counted and recorded. The salvaged fish are then returned to the Delta in oxygenated tank trucks.

During normal operations, salvaged fish are transported approximately 19 miles (30 km) and released at one of six SWP and CVP release sites near the confluence of the Sacramento and San Joaquin rivers. Until recently, most fish hauls from the Skinner Fish Facility and the CVP Tracy Fish Facility have been released at either the SWP Horseshoe Bend Release Site or the SWP Curtis Landing Release Site on an alternating basis. Since 2020 DWR has re-operated the release site rotation schedule to incorporate four fish release sites including two new sites (Little Baja and Manzo Ranch). In 2022, DWR also entered into an agreement with the Bureau of Reclamation to utilize their release sites at Antioch and Emmaton on a cooperative basis. The SWP Horseshoe Bend Release Site is no longer used.

2.1.1.3 Clifton Court Forebay

The CCF is located near the city of Byron in the South Delta. The Banks Pumping Plant pumps water diverted from the CCF via the intake channel past Skinner Fish Facility. A set of five radial gates are located at the CCF inlet near the confluence of the Grant Line and West Canal. They are operated so that they can be closed during critical periods of the ebb/flood tidal cycle to maintain appropriate water levels for local agricultural water users in the South Delta. The gates are operated on the tidal cycle to reduce approach velocities, prevent scour in adjacent channels, and minimize fluctuations in water elevation in the South Delta by taking water in through the gates at times other than low tide. Banks Pumping Plant pumping rates are constrained operationally by limits on CCF diversions from the Delta.

The typical maximum daily diversion limit from the Delta into the CCF is 13,870 acre-feet (af) per day (6,990 cfs/day) and the maximum averaged diversion limit over any three days is 13,250 af per day (6,680 cfs/day). In addition to these requirements, currently DWR may increase diversions from the Delta into the CCF by one-third of the San Joaquin River flow at Vernalis from mid-December through mid-March when flows at Vernalis exceed 1,000 cfs. These limits are listed in USACE Public Notice 5820A Amended (Oct. 13, 1981).

From July through September, the maximum daily diversion limit from the Delta into the CCF may be increased from 13,870 af per day (6,990 cfs/day) to 14,860 af per day (7,490 cfs/day), and the maximum averaged diversion limit over any three days is increased from 13,250 af per day (6,680 cfs/day) to 14,240 af per day (7,180 cfs/day). These increases are for the purpose of recovering water supply losses incurred earlier in the same year to protect fish species listed under the state and federal Endangered Species Acts.

2.1.1.4 Barker Slough Pumping Plant

The BSPP diverts water from Barker Slough into the North Bay Aqueduct (NBA) for delivery to Napa and Solano counties. The NBA intake is located approximately 10 miles from the mainstem Sacramento River at the end of Barker Slough. In accordance with salmon screening criteria, each of the aqueduct's 10 pump bays are individually screened with a positive barrier fish screen consisting of a series of flat, stainless-steel, wedge-wire panels with a slot width of 3/32 inch. This configuration is designed to exclude and prevent the entrainment of fish measuring approximately 1 inch or larger. The bays tied to the two smaller units have an approach velocity of about 0.2 foot per second (ft/sec). The larger units were designed for a 0.5 ft/sec approach velocity, but actual approach velocity is about 0.44 ft/sec. The screens are routinely cleaned to prevent excessive head loss, minimizing increases in localized approach velocities.

The first two bays have small pump unit (nominally 14 cfs), and seven bays have larger pump units (nominally 28 cfs). The last bay does not have a pump. The maximum pipeline capacity is 175 cfs, but currently the normal pumping rate is between 0 cfs and 130 cfs because the maximum pipeline capacity cannot be reached due to biofilm accumulation in the pipe.

Barker Slough Pumping Plant Fish Screen Cleaning

DWR cleans the BSPP screens once a month using a truck-mounted crane to lift the screens up and a high-pressure hose sprayed from the back side of the screens. Fish screen cleaning, sediment removal, and aquatic weed removal at the BSPP is needed year-round to maintain operation of the BSPP. Raising and cleaning of the fish screens is necessary to prevent excessive head loss and minimize localized approach velocities.

Barker Slough Pumping Plant Sediment Removal

Sediment removal from the trap and concrete apron in front of the facility is necessary to prevent accumulation and clogging of the screens and facility. Sediment removal is conducted from June 1 through October 15 when water temperatures are greater than 25 degrees Celsius (°C) and during the annual NBA shutdown in March. The NBA is annually taken off-line for one to two weeks for routine maintenance and repairs, and the BSPP is non-operational during this period. If sediment removal is conducted when the water temperature is less than 25 °C, a CDFW-approved Designated Biologist is required to be present during the sediment removal. Removal of sediment from within the pump wells would occur as needed, year-round. Sediment will be tested and disposed of at a suitable location or existing landfill.

Barker Slough Pumping Plant Aquatic Weed Removal

Removal of aquatic weeds is necessary to avoid blocking flow and causing water levels to drop in the pump wells behind the screens, triggering automatic shutoffs to protect the pumps from cavitation. The aquatic weed removal system consists of grappling hooks attached by chains to an aluminum frame. A boom truck staged on the platform in front of the BSPP pumps lowers the grappling system into the water to retrieve the accumulated aquatic vegetation. The removed aquatic weeds are transported to two aggregate base spoil sites located near the BSPP. Removal of aquatic weeds from the BSPP fish screens occurs from June 1 through October 15 when water temperatures are greater than 25 °C and aquatic weed production is highest. Floating aquatic vegetation (i.e., water hyacinth), could be removed during spring months if vegetation becomes entrained into Barker Slough and accumulates in front of BSPP fish screens. If aquatic weed removal is necessary during other times of the year, or if the water temperature is less than 25 °C, a CDFW-approved Designated Biologist is required to be present during the activity.

2.1.1.5 Suisun Marsh Operations

The Suisun Marsh Preservation Agreement (SMPA) among DWR, U.S. Bureau of Reclamation (Reclamation), CDFW, and Suisun Resource Conservation District contains provisions for DWR and Reclamation to mitigate the impacts on Suisun Marsh channel water salinity from SWP and CVP operations and other upstream diversions. The SMPA requires DWR and Reclamation to meet salinity standards in accordance with D-1641, sets a timeline for implementing the Plan of Protection, and delineates monitoring and mitigation requirements.

There are two primary physical mechanisms for meeting salinity standards set forth in D-1641 and the SMPA: (1) the implementation and operation of physical facilities in the Marsh and (2) management of Delta outflow (i.e., facility operations are driven largely by salinity levels upstream of Montezuma Slough, and salinity levels are highly sensitive to Delta outflow). Physical facilities (described below) have been operating since the 1980s and have proven to be a highly reliable method for meeting standards.

Physical facilities in the Suisun Marsh and Bay include the SMSCG, the RRDS, the MIDS, and the GYSO. The location and operation of these facilities are described below.

Suisun Marsh Salinity Control Gates

The SMSCG are located on Montezuma Slough about 2 miles downstream from the confluence of the Sacramento and San Joaquin rivers, near Collinsville. The objective of SMSCG operation is to decrease the salinity of the water in Montezuma Slough. The gates control salinity by restricting the flow of higher-salinity water from Grizzly Bay into Montezuma Slough during incoming tides and retaining lower-salinity Sacramento River water from the previous ebb tide. Operation of the gates in this fashion lowers salinity in Suisun Marsh channels and results in a net movement of water from east to west through Suisun Marsh.

The SMSCG are operated during the salinity control season, which spans from October to May. Operational frequency is affected by salinity at D-1641 compliance stations, hydrologic conditions, weather, Delta outflow, tide, fishery considerations, and other factors. The boat lock portion of the gate is now held partially open during SMSCG operation to allow an opportunity for continuous salmon passage but could be closed temporarily to stabilize flows to facilitate safe passage of watercraft through the facility.

Roaring River Distribution System

The RRDS was constructed to provide lower-salinity water to 5,000 acres of private and 3,000 acres of CDFW-managed wetlands on Simmons, Hammond, Van Sickle, Wheeler, and Grizzly islands. The RRDS includes a 40-acre intake pond that supplies water to Roaring River Slough. Water is diverted through a bank of eight 60-inch-diameter culverts equipped with fish screens into the Roaring River intake pond on high tides to raise the water surface elevation in the RRDS above the adjacent managed wetlands. The intake to the RRDS is screened to prevent entrainment of fish larger than approximately 25 millimeters (mm). After the listing of Delta Smelt, RRDS diversion rates have been controlled to maintain a maximum average approach velocity of 0.2 ft/sec at the intake fish screen except during the period from September 14 through October 20, when RRDS diversion rates are controlled to maintain a maximum average approach velocity of 0.7 ft/sec for fall flood-up operations.

Morrow Island Distribution System

The MIDS consists of three unscreened 48-inch intakes that allow DWR and Reclamation to provide fresher water to the landowners for managed wetland activities approved in local management plans. The system was constructed primarily to channel drainage water from the adjacent managed wetlands for discharge into Suisun Slough and Grizzly Bay, which increases circulation and reduces salinity in Goodyear Slough. The MIDS is used year-round, but most intensively from September through June. When managed wetlands are filling and circulating, water is tidally diverted from Goodyear Slough just south of Pierce Harbor.

Goodyear Slough Outfall

The GYSO connects the south end of Goodyear Slough to Suisun Bay. Prior to construction of the outfall, Goodyear Slough was a dead-end slough. The GYSO was designed to increase circulation and reduce salinity in Goodyear Slough to provide higher water quality to the wetland managers who flood their ponds with Goodyear Slough water. GYSO has a series of four passive intakes that drain to Suisun Bay. The outfall is equipped with slide gates on the interior of the outfall structure to allow DWR to close the system for maintenance or repairs. The intakes and outfall of GYSO are unscreened but are equipped with trash racks to prevent damage. Because the GYSO is an open system, any fish that entered the system would be able to leave via the intake or the outfall.

2.1.1.6 Georgiana Slough Migratory Barrier

DWR will install and operate a salmonid migratory barrier at Georgiana Slough annually during the juvenile salmonid migration period to reduce the likelihood of emigrating salmonid entrainment into the central and south Delta. A salmonid migratory barrier at Georgiana Slough is expected to provide a higher probability of survival for emigrating juvenile winter-run and spring-run Chinook Salmon that encounter the Sacramento River-Georgiana Slough junction and reduce entrainment of emigrating juveniles into the central and south Delta. Annual installation of the barrier is covered by a separate Incidental Take Permit (ITP, Permit No. 2081-2021-102-03) and Initial Study and Mitigated Negative Declaration under CEQA (State Clearinghouse Number 2021100009). Operation of the barrier will be covered under DWR's new ITP.

2.1.1.7 Agricultural Barriers

The Agricultural Barriers are designed to help improve water levels, circulation patterns, and water quality in the southern Delta for local agricultural diversions. Operation of the Agricultural Barriers is part of the long-term operation of the SWP and CVP. The Agricultural Barriers are installed at the following locations:

- Middle River near the Victoria Canal, about 0.5 mile south of the confluence of Middle River, Trapper Slough, and the North Canal
- Old River near Tracy, approximately 0.5 mile east of the Delta-Mendota Canal (DMC) intake
- Grant Line Canal, approximately 400 feet east of the Tracy Boulevard Bridge

Rock barriers at Old River near Tracy, Middle River, and the Grant Line Canal are in place no earlier than May 1. These barriers are installed annually based on local conditions and are not necessarily installed on May 1 every year. The rock barriers are notched to allow adult salmon passage by September 15 and are removed from the channels by November 30 each year. The Old River barrier near Tracy has been installed since 1991, the Middle River barrier has been installed since 1987, and the Grant Line Canal barrier has been installed since 1996 (with the exception of 1998). Full closure of the Grant Line Canal Barrier requires National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and CDFW approval and a demonstrated need for the full closure based on actual conditions and hydrodynamic modeling.

This ~~ITP application~~ EIR is focused on the operation of the Agricultural Barriers within the South Delta and does not analyze or address the construction or removal of the rock barriers, which is covered by separate NMFS (WRCO-2022-02869) and USFWS (2023-0004507-S7-001) biological opinions (BiOps) and ITP (ITP Number 2081-2021-079-03).

2.1.1.8 San Luis Reservoir

San Luis Reservoir is an off-stream storage facility located along the California Aqueduct downstream of the Jones and Banks pumping plants. The CVP and SWP share San Luis Reservoir storage roughly 50/50 (CVP has 966 thousand acre-feet [taf] of storage, and SWP has 1,062 taf of storage). San Luis Reservoir is used by both the SWP and CVP to meet deliveries to their contractors during periods when Delta pumping is insufficient to meet demands. San Luis Reservoir is also operated to supply water to the CVP San Felipe Division in San Benito and Santa Clara counties.

San Luis Reservoir operates as a regulator on the CVP/SWP system, accepting any water pumped from the Banks and Jones pumping plants that exceeds contractor demands, then releasing that water back to the aqueduct system when the pumping at the Jones and Banks pumping plants is insufficient to meet demands. The reservoir allows the CVP/SWP to meet peak-season demands that are seldom balanced by Jones and Banks pumping.

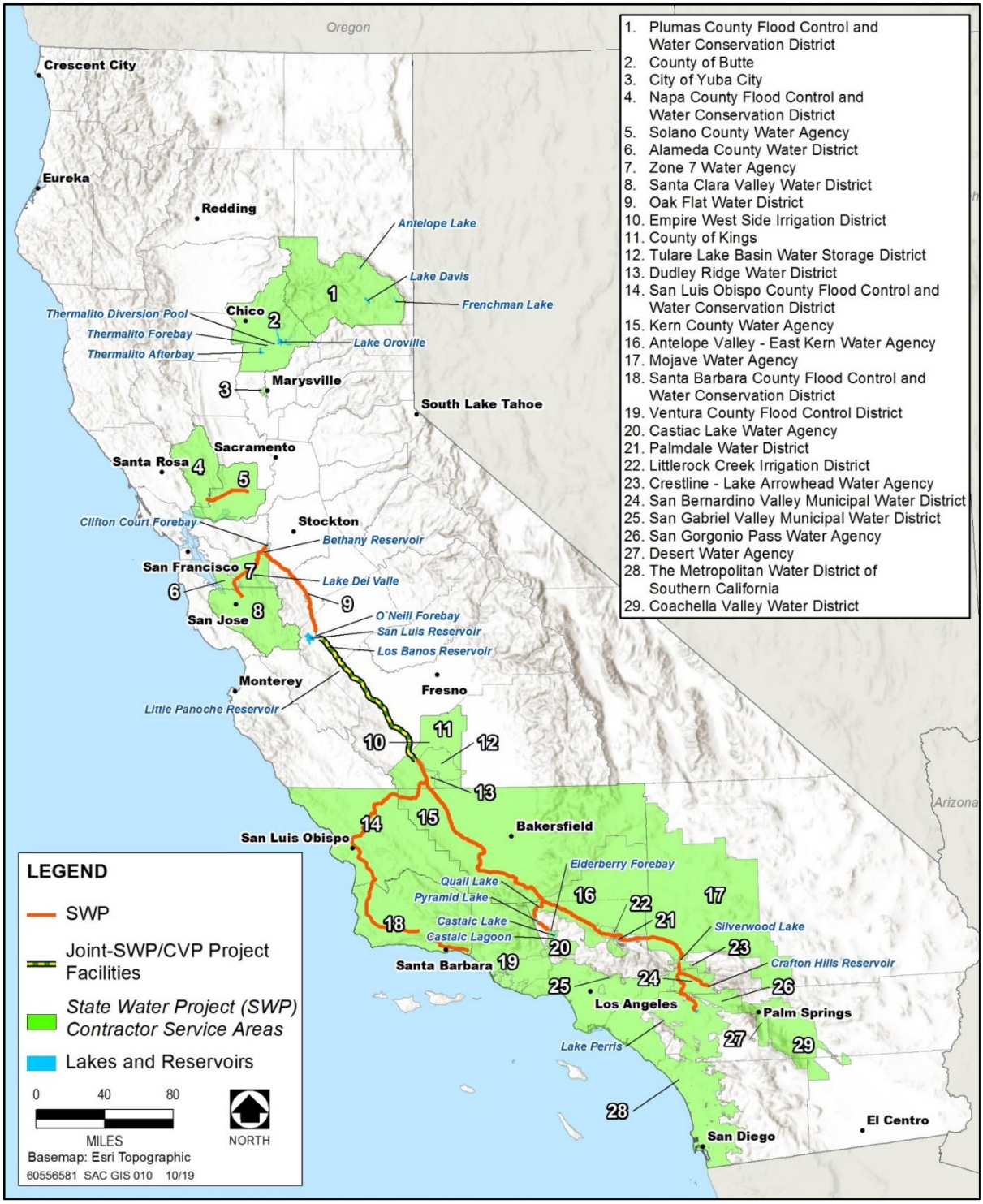
As San Luis Reservoir is drawn down to meet contractor demands, it usually reaches its low point in late August or early September. From September through early October, demand for deliveries declines until it is less than the rate of diversions from the Delta at the Jones and Banks pumping plants. At this point, the additional diverted water is added to San Luis Reservoir, reversing its spring and summer decline and eventually filling the San Luis Reservoir—typically before April of the following year.

2.1.1.9 Delta-Mendota Canal/California Aqueduct Intertie

The Delta-Mendota Canal/California Aqueduct Intertie (DCI) is a Reclamation facility that is co-operated by the CVP and SWP and provides the ability to move water from the DMC to the California Aqueduct. The DCI provides up to 900 cfs gravity flow from the California Aqueduct to the DMC and up to 467 cfs pumping capacity from the DMC to the California Aqueduct. Though the DCI provides the capability to convey water in both directions, the primary use has been pumping water from the DMC to the California Aqueduct. The DCI helps to offset loss of canal capacity due to subsidence on the upper DMC, which has affected the CVP's ability to utilize the full design capacity of the Jones Pumping Plant. The Jones Pumping Plant has for the most part been limited to about 3,600 cfs without the use of the DCI. Due to continued subsidence, the frequency of DCI use has increased.

2.1.4 Description of Existing SWP Water Service Contracts

DWR has signed long-term contracts with 29 water agencies statewide to deliver water supplies developed from the SWP system (Figure 2-2). These contracts are with both municipal and industrial (M&I) water users and agricultural water users. The contracts specify the charges that will be made by the water agency for both (1) water conservation and (2) conveyance of water. The foundation allocation of water to each contractor is based on their respective "Table A" entitlement, which is the maximum amount of water delivered to them by the SWP on an annual basis.



Source: California Department of Water Resources 2019

Figure 2-2. The 29 Water Purveyors Under Contract to Receive SWP Water Deliveries

Under statewide contracts, DWR allocates Table A water as an annual supply made available for scheduled delivery throughout the year. Table A contracts total 4,173 taf, with more than 3 maf for San Joaquin Valley and Southern California water users.

Article 21 of the long-term SWP water supply contracts provides an interruptible water supply made available only when certain conditions exist: (1) the SWP share of San Luis Reservoir is physically full or is projected to be physically full; (2) other SWP reservoirs south of the Delta are at their storage targets or the conveyance capacity to fill these reservoirs is maximized; (3) the Delta is in excess conditions; (4) current Table A demand is being fully met; and (5) Banks Pumping Plant has export capacity beyond that which is needed to meet current Table A and other SWP operational demands.

Table 2-1 shows the maximum contracted annual water supply per water purveyor per DWR's most recent water supply reliability report.

Table 2-1. State Water Contractors

State Water Contractors	Table A Contracted Water Supply (acre-feet)	Purpose of Use
Butte County	27,500	M&I
Plumas County	2,700	M&I
Yuba City	9,600	M&I
Napa County Flood Control and Water Conservation District	29,025	M&I
Solano County Water Agency	47,756	M&I
Alameda County—Zone 7	80,619	M&I
Alameda County Water District	42,000	M&I
Santa Clara Valley Water District	100,000	M&I
Oak Flat Water District	5,700	Agriculture
Kings County	9,305	Agriculture
Dudley Ridge Water District	45,350	Agriculture
Empire West Side Irrigation District	3,000	Agriculture
Kern County Water Agency	982,730	Agriculture/M&I[a]
Tulare Lake Water Storage District	87,471	Agriculture
San Luis Obispo County	25,000	M&I
Santa Barbara County	45,486	M&I
Antelope Valley-East Kern Water Agency	144,844	Agriculture/M&I[b]
Santa Clarita Valley Water Agency	95,200	M&I
Coachella Valley Water District	138,350	M&I
Crestline-Lake Arrowhead Water Agency	5,800	M&I
Desert Water Agency	55,750	M&I
Littlerock Creek Irrigation District	2,300	M&I
Metropolitan Water District of Southern California	1,911,500	M&I
Mojave Water Agency	85,800	M&I
Palmdale Water District	21,300	M&I
San Bernardino Valley Municipal Water District	102,600	M&I
San Gabriel Valley Municipal Water District	28,800	M&I
San Gorgonio Pass Water Agency	17,300	M&I
Ventura County Watershed Protection District	20,000	M&I

Source: California Department of Water Resources 2016
Notes:
[a] Approximately 15% of the Kern County Water Agency Table A Amount is classified as municipal and industrial (M&I) supply.
[b] Approximately 25% of the Antelope Valley-East Kern Water Agency Table A amount is used for agricultural purposes.
M&I = municipal and industrial

2.1.5 SWP Settlement Agreements

DWR has water rights settlement agreements to provide water supplies with entities upstream of Oroville, along the Feather River and Bear River, and in the Delta. These agreements provide diverters with SWP water supplies. The agreements are premised upon the idea that these diverters were entitled to water prior to the construction of the SWP's Oroville Complex. Collectively, these agreements between DWR and more than 60 riparian diverters along the Feather and Bear rivers provide water for diversion. Table 2-2 summarizes the volume under the water rights settlement agreements. In addition to Table 2-2, additional water may be diverted by the Feather River Settlement Contractors agreement, which allows for diversion of SWP water in the fall and winter months consistent with their settlement contracts. DWR operates the SWP in accordance with these contracts with senior water rights holders in the Feather River Service Area (approximately 983 taf) and in the Delta.

Table 2-2. SWP Settlement Agreements

Location	Entity	Amount (Acre-Feet)
North of Oroville	Andrew Valberde	135
North of Oroville	Jane Ramelli	800
North of Oroville	Last Chance Creek WD	12,000
Feather River	Garden Highway Mutual Water	18,000
Feather River	Joint Water Districts Board	620,000
Feather River	South Feather Water & Power	17,555
Feather River	Oswald WD	3,000
Feather River	Plumas Mutual Water	14,000
Feather River	Thermalito Irrigation District	8,200
Feather River	Tudor Mutual Water	5,000
Feather River	Western Canal/PG&E	295,000
Bear River	South Sutter/Camp Far West	4,400
Delta	Byron-Bethany ID	50,000
Delta	East Contra Costa ID	50,000
Delta	Solano Co./Fairfield, Vacaville and Benicia	31,620

Notes:
ID = Irrigation District
PG&E = Pacific Gas and Electric Company
WD = Water District

2.1.6 SWP Allocation and Forecasting

At the beginning of each new water year, significant uncertainty exists regarding hydrologic conditions and water supplies that will be allocated by the SWP to its water contractors. In recognition of this uncertainty, DWR plans the operations of the SWP by projecting monthly on a 12-month look-ahead cycle. The initial allocation for SWP deliveries is made by December 1 of each year with a conservative assumption of future precipitation to avoid over-allocating water before the hydrologic conditions are well defined for the year. The forecasting water supply allocation process that is updated monthly and incorporates known conditions in the Central Valley watershed to date, as well as forecasts of future hydrologic conditions to provide an estimate of SWP water supplies that can be delivered to SWP contractors as the water year progresses.

Another water supply consideration is the contractual ability of SWP contractors to "carry over" allocated but undelivered Table A supplies from the previous year to the next if space is available in San Luis Reservoir. The carryover storage is often used to supplement an individual contractor's current year Table A allocations if conditions are dry. Carryover supplies left in San Luis Reservoir by SWP contractors can result in higher storage levels in San Luis Reservoir. As SWP pumping fills San Luis Reservoir, the contractors are notified to take, or lose, their carryover supplies. Carryover water not taken, after notice is given to remove it, then becomes water available for reallocation to all contractors in a given year.

Article 21 (surplus to Table A) water, which is delivered early in the calendar year, may be reclassified as Table A water later in the year depending on final allocations, hydrology, and contractor requests.

Reclassification does not affect the amount of water carried over in San Luis Reservoir, nor does it alter pumping volumes or schedules.

2.1.7 Daily Operations

After the allocations and forecasting process, DWR and Reclamation coordinate their operations on a daily basis. Some factors DWR and Reclamation consider when coordinating their joint operations include required in-Delta flows, Delta outflow, water quality, schedules for the joint use facilities, pumping and wheeling arrangements, and any facility limitations. Additionally, both the SWP and CVP must meet the flood obligations of individual reservoirs. CVP operations must also consider flows at Wilkins Slough and associated pump intake elevations.

During balanced water conditions, when releases from upstream reservoirs plus unregulated flows approximately equal the water supply needed to meet Sacramento Valley in-basin uses plus Delta exports, DWR and Reclamation maintain a daily water accounting of CVP and SWP obligations. This accounting allows for flexible operations and avoids the need to change reservoir releases made several days in advance (due to travel time from the Delta). Therefore, adjustments can be made "after the fact," using actual observed data rather than using predictions of reservoir inflow, storage withdrawals, and in-basin uses. This iterative process of observation and adjustment results in a continuous trueing up of the running COA account. If either the SWP or CVP is "owed" water (i.e., the project that provided more or exported less than its COA-defined share), each may request the other to adjust its operations to reduce or eliminate the accumulated account within a reasonable time.

The COA provides the mechanism for determining SWP and CVP responsibility for meeting in-basin use, but real-time conditions dictate real-time actions. Conditions in the Delta can change rapidly. For example, weather conditions combined with tidal action can quickly affect Delta salinity conditions and, therefore, the Delta outflow required to maintain joint salinity standards under D-1641.

Increasing or decreasing SWP or CVP exports can achieve changes to Delta outflow immediately. Imbalances in meeting each other's initial shared obligations are captured by the COA accounting and balanced out later.

When more reaction time is available, reservoir release changes are used to adjust to changing in-basin conditions and are coordinated with Reclamation. DWR's Lake Oroville releases require about three days to reach the Delta, while water released from Reclamation's Shasta Reservoir requires five days to travel from Keswick Reservoir to the Delta, and Folsom Reservoir water requires one day to travel to the Delta. Each occurrence is evaluated on an individual basis and appropriate action is taken based on multiple factors.

The duration of balanced water conditions varies from year to year. Balanced conditions never occur in some very wet years, while very dry years may have long continuous periods of balanced conditions, and still other years may have several periods of balanced conditions interspersed with excess water conditions. Account balances continue from one balanced water condition through the excess water condition (when releases from upstream reservoirs plus unregulated flows exceed Sacramento Valley in-basin uses plus Delta exports) into the next balanced water condition. When either the SWP or CVP enters into flood control operations, the accounting is zeroed out for that project.

DWR and Reclamation staff meet daily to discuss and coordinate CVP and SWP system operations. Several items are discussed at this daily meeting, including:

- Current reservoir conditions
- Pumping status and current outages (for both the CVP and the SWP and how they are affecting combined operations)
- Upcoming planned outages (CVP and SWP) and what that means for future operations
- Current reservoir releases and what changes may be planned
- Current regulatory requirements and compliance status
- Delta conditions to determine if CVP and SWP pumping make use of all available water

DWR and Reclamation also coordinate with Hydrosystem Controllers and Area Offices to ensure that, if necessary, personnel are available to make the desired changes. Once DWR and Reclamation each decide on a plan for that day and complete all coordination, the respective agencies issue change orders to implement the decisions, if necessary.

DWR and Reclamation are co-located in the Joint Operations Center. The California Data Exchange Center (CDEC), California-Nevada River Forecast Center, and the DWR Flood Management Group are also co-located in the Joint Operations Center. This enables efficient and timely communication, particularly during flood events.

2.1.8 Delta Fish Agreement

The Delta Fish Agreement (DFA) is a 1986 agreement that DWR and CDFW entered to mitigate for the significant impact identified in the Final Environmental Impact Report on the Additional Pumping Units at Harvey O. Banks Delta Pumping Plant. The DFA's stated purpose is to offset direct losses of fish at the Banks Pumping Plant. Since 1986, DWR has funded several mitigation projects and contracts under DFA procedures. The legal environment has evolved significantly since 1986 and SWP operations are now subject to multiple endangered species regulatory requirements, including a CESA ITP and federal Endangered Species Act (ESA) BiOps covering long-term operations of the SWP and CVP. DWR will work with CDFW to update the DFA program in consideration of the existing regulatory landscape and mutually agreed-upon objectives that address present-day challenges.

2.2 Existing Regulations

2.2.1 U.S. Army Corps of Engineers Permits

In Public Notice 5820A (October 1981), USACE limited the volume of daily SWP diversions from the Delta into CCF, stating that such diversions may not exceed 13,870 af and three-day average diversions into the CCF may not exceed 13,250 af. In addition, the SWP can increase diversions into the CCF by one-third of the San Joaquin River flow at Vernalis from mid-December to mid-March when the river's flow at Vernalis exceeds 1,000 cfs (U.S. Army Corps of Engineers 1981).

In August 2013, USACE issued Permit SPK-1999-00715 and raised the daily diversion from 13,870 af to 14,860 af and the three-day average diversion from 13,250 af to 14,240 for calendar years 2013 through 2016 (U.S. Army Corps of Engineers 2013). These increased diversions also required compliance with applicable terms and conditions in the existing BiOps and installation of the South Delta temporary barriers.

In 2017, USACE issued a revised Permit SPK-1999-00715 and raised the daily diversion from 13,870 af to 14,860 af and the three-day average diversion from 13,250 af to 14,240 af. The conditions in this permit applied to SWP operations from 2017 through 2020 (U.S. Army Corps of Engineers 2016). A subsequent modification in September of 2021 extended the permit to apply to SWP operations through September 30,2029 (U.S. Army Corps of Engineers 2021).

In 2023 the project description was amended, and Special Condition 5 was removed. Condition 5 stated that "all three temporary agricultural barriers (Middle River, Old River near Tracy and Grant Line Canal) shall be in place and operating when SWP diversions are increased." (U.S. Army Corps of Engineers 2023). The permit also required compliance with applicable terms and conditions in the existing BiOps and installation of the South Delta temporary barriers.

2.2.2 State Water Resources Control Board Water Rights and D-1641

DWR and Reclamation operate the CVP and the SWP in accordance with the joint obligations under D-1641, which provides protection for fish and wildlife, M&I water quality, agricultural water quality, and Suisun Marsh salinity. D-1641 granted DWR and Reclamation the ability to use or exchange either SWP or CVP diversion capacity capabilities to maximize the beneficial uses of the CVP and SWP. The State Water Board conditioned the use of Joint Point of Diversion capabilities based on staged implementation and conditional requirements for each stage of implementation.

2.2.3 Federal Endangered Species Act

The 2019 USFWS BiOp and 2019 NMFS BiOp, issued pursuant to Section 7 of the ~~federal Endangered Species Act (~~ ESA ~~)~~ , are the current ESA authorizations for the SWP and CVP. Both BiOps allow the SWP and CVP to continue operating without causing jeopardy to listed species or adverse modification to designated critical habitat.

On August 2, 2016, DWR and Reclamation jointly requested the Reinitiation of Consultation on the Coordinated Long-Term Operation of the CVP and SWP following several years of drought and due to new information developed since issuance of the last BiOps in 2008 and 2009. USFWS accepted the reinitiation request on August 3, 2016, and NMFS accepted the reinitiation request on August 17, 2016. Reclamation completed a biological assessment to support consultation under ESA Section 7, which documented the potential impacts of the proposed action on federally listed endangered and threatened species that have the potential to occur in the study area and on critical habitat for these species. The biological assessment also fulfilled consultation requirements for the Magnuson-Stevens Fishery Conservation and Management Act of 1976 for essential fish habitat.

In January 2019, DWR and Reclamation transmitted to USFWS and NMFS a biological assessment for the reinitiation of consultation on CVP and SWP operations through the year 2030. Following further discussions with the fish agencies, DWR and Reclamation transmitted a final Proposed Action to USFWS and NMFS on October 11, 2019. The new USFWS and NMFS BiOps were issued on October 21, 2019, and they included incidental take statements for Delta Smelt, winter-run Chinook Salmon, spring-run Chinook Salmon, Green Sturgeon, and steelhead. These BiOps were formally adopted on February 19, 2020 when Reclamation signed the Record of Decision (ROD).

The 2019 BiOps and 2020 ROD were challenged in federal court. See Pac. Coast Fed'n of Fishermen's Ass'n v. Ross, No. 1:20−cv−00431 (E.D. Cal.); Cal. Natural Resources Agency v. Ross, No. 1:20-cv-00426 (E.D. Cal.). In those cases, the court granted voluntary remand of the 2019 BiOps and the 2020 ROD without vacatur and approved an Interim Operations Plan for CVP and SWP operations in 2022, 2023, and 2024.

In 2021, Reclamation, in coordination with DWR, requested ~~reinitation~~ reinitiation of consultation on the long-term operation of the CVP and SWP with both the USFWS and NMFS to address the review of agency actions required by Executive Order 13990 and to voluntarily reconcile CVP operating criteria with operational requirements of the SWP under CESA. Consultation is ongoing.

2.2.4 California Endangered Species Act

In 2020, CDFW issued an ITP for the ongoing and long-term operation of the SWP's existing facilities in the Delta, which covered four CESA-listed fish species—Delta Smelt, Longfin Smelt, winter-run Chinook Salmon, and spring-run Chinook Salmon.

In light of various ongoing regulatory processes involving SWP operations, including the reinitiation of section 7 consultation under the ESA, DWR is seeking a new ITP from CDFW to replace the 2020 ITP, which expires on March 31, 2020. The new ITP will cover the same four CESA-listed fish species that are subject to incidental take from long-term operation of the SWP, as well as White Sturgeon, which could obtain protection under CESA as a candidate species during 2024 and may become a CESA-listed species in 2025.

2.3 Description of the Proposed Project

The SWP facilities in the Delta are described in Section 2.1.3, "Description of Existing Facilities Relevant to Proposed Project Operations."

The Proposed Project consists of multiple elements that characterize future operations of SWP facilities including modifying operations of Banks Pumping Plant, Skinner Fish Protection Facility, Clifton Court Forebay, Barker Slough Pumping Plant, and Suisun Marsh facilities, modifying ongoing programs being implemented as part of SWP operations, improving specific activities that would enhance protection of special-status fish species, or supporting ongoing studies and research on these special-status species to improve the basis of knowledge and management of these species. Implementation of these elements is intended to continue operation of the SWP and deliver up to the full contracted water amounts while minimizing and fully mitigating the take of listed species, consistent with CESA requirements.

These elements are divided into three categories that consist of (1) proposed SWP operations and actions required to continue safe operation of the SWP facilities to meet existing requirements; (2) proposed environmental protective measures that would offset, reduce, or otherwise mitigate potential environmental impacts on CESA-listed species, and (3) special studies and adaptive management actions that include establishing a governance framework, a compliance and reporting program, specific drought - and dry-year actions, and independent review panels, as well as conducting Periodic Reviews of management measures. Take is being sought for SWP operations and actions that fall into the first category and some of the actions that fall into the second category.

Table 2-3 identifies the operations and actions under the proposed project for which take is sought.

Table 2-3. Summary of Proposed Project Elements for which Take is Sought

SWP Facility/Action	Proposed Project Operations/Actions for which Take is Sought
Existing Regulatory Requirements	Continue to comply with existing limits and permit requirements to protect water quality for the beneficial uses of fish and wildlife, agriculture and urban uses under State Water Board Water Right Decision 1641 (D-1641) and USACE Permit 2100.
Minimum Export Rate	Establish minimum export rate to protect human health and safety. The combined CVP and SWP export rates at Jones Pumping Plant and Banks Pumping Plant will not be required to drop below 1,500 cfs.
Expansion of the Clifton Court Forebay Increased Winter Diversion Window	Expand to December 1 through March 31 the period when diversions into CCF may be increased by one-third of the San Joaquin River flow at Vernalis when those flows exceed 1,000 cfs.
Old and Middle River Flow Management	Manage OMR reverse flows based on species distribution, modeling, and risk analysis, with provisions for capturing storm flows.
Spring Delta Outflow	Implement Voluntary Agreements to increase Delta outflow through export reductions and supplemental flow purchases.
Delta Smelt Summer-Fall Habitat	DWR and Reclamation will maintain a 30-day average X2 ≤ 80 km from September 1 through October 31. DWR will operate the Suisun Marsh Salinity Control Gate for 30 or 60 days from June through October, depending on water-year type, to improve Delta Smelt habitat.
John E. Skinner Delta Fish Protective Facility	Continue ongoing salvage fish at the Skinner Fish Facility and implement actions to reduce post-salvage predation and improve the accuracy and reliability of data and fish survival.
Delta Smelt Supplementation	Supplement the wild Delta Smelt population with hatchery-reared fish to address the Allee effect in the baseline status of wild Delta Smelt. Supplement up to 500,000 by 2030.
Water Transfers	Water transfers could be contained between July through November, with volumes up to 600 TAF.
Agricultural Barriers	Maintain ongoing annual installation of three South Delta Temporary Agricultural Barriers with goal of maintaining surface water levels and circulation in the South Delta according to existing terms and conditions.
Georgiana Slough Salmonid Migratory Barrier Operations	DWR will update and operate to the Georgiana Slough Salmonid Migratory Barrier Operations Plan (Appendix 2F) and associated operating criteria in collaboration with CDFW, USFWS, and NMFS under the Adaptive Management Program (Appendix 2B) to maximize benefits to migrating winter-run and spring-run Chinook Salmon.
Barker Slough Pumping Plant	Continue operating BSPP to minimize effects on Delta Smelt and Longfin Smelt, and continue implementing sediment removal and aquatic weed management actions as part of normal operations at Barker Slough Pumping Plant.
Clifton Court Forebay Weed Management	Control weeds to reduce impacts on the SWP's physical facilities (clogging screens) and predator abundance.
Suisun Marsh Facilities	Operate the Suisun Marsh Salinity Control Gates, Roaring River Distribution System, Morrow Island Distribution System, and Goodyear Slough Outfall in compliance with D-1641.

DWR is requesting an ITP for the exercise of discretion in operational decision-making, including how to comply with the terms of its existing water supply and settlement contracts (which include maximum deliveries under the terms of these contracts), and other legal obligations. DWR is not requesting an ITP from CDFW for the following actions:

- Flood control
- Oroville Dam and Feather River operations
- Execution of SWP contracts
- Coordinated Operation Agreement
- Any previously identified or potential future habitat restoration actions[1]
- Suisun Marsh Habitat Management Preservation and Restoration
- Suisun Marsh Preservation Agreement
- CVP facilities, operations, and agreements
- Annual Installation of a migratory fish barrier at Georgiana Slough
- Development of the spring-run Chinook Salmon Juvenile Production Estimate
- Longfin Smelt Science Plan
- Longfin Smelt Culture Program
- Central and South Delta Monitoring
- Yolo Notch Survival Studies
- Existing ongoing monitoring programs or modifications to existing ongoing monitoring programs
- Special Studies
- Actions identified in the Drought Toolkit

These facilities and operations activities are or will be covered under separate permits or addressed by other legal authorities.

DWR and Reclamation coordinate operations of their facilities in the Delta, including some of the Proposed Project elements, but DWR has sole responsibility and discretion regarding operation of the SWP facilities. The following sections discuss the elements of the Proposed Project in detail and when the Proposed Project elements are described as being conducted by DWR and Reclamation, it should be noted that DWR maintains sole responsibility for these elements and its share of the actions. Although DWR coordinates with Reclamation, it does not have authority over CVP operations.

[1] CESA coverage for habitat restoration actions will be covered under separate CESA permitting processes.

2.3.1 Seasonal Operations

In the winter and spring, DWR typically exports excess water. Excess water conditions occur when releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley in-basin uses and exports. Actions to minimize entrainment of listed fish into the south Delta and at the Jones and Banks Pumping Plants limit the export of excess water. Exports during the winter and spring reduce the reliance on conveying previously stored water in the summer and fall for south-of-Delta water supply needs. In dry conditions, DWR may need to increase releases from upstream reservoirs beyond what is needed to meet minimum flow requirements to meet water quality or outflow requirements in the Delta.

During the summer, the CVP and SWP convey previously stored water through the Delta for export at the Jones Pumping Plant, Banks Pumping Plant, and other Delta facilities. Delta operations during the summer typically focus on maintaining salinity and meeting Delta outflow objectives while maximizing exports with the available water supply. In addition, the CVP and SWP make upstream reservoir releases for water temperature management and instream flows, which may be available for export after outflow, salinity, and in-Delta needs have been met.

In the fall, operations are adjusted to meet salinity requirements, Delta outflow requirements, and peak demands from Central Valley Plan Improvement Act (CVPIA) wildlife refuges. Upstream and in-Delta demands typically decrease, and accretions within the system typically increase. When water is available and not required for salinity and Delta outflow requirements, late summer and fall provide an opportunity to export water and start filling San Luis Reservoir for the next water year. When conditions are dry, there is little opportunity for exports. Releases from upstream reservoirs generally decrease to conserve water in storage for the next year. On occasion, releases to conserve flood storage or maintain inundation of salmonid redds may occur and result in additional flows into the Delta.

The Banks Pumping Plant pumps water from CCF. The CCF radial gates are closed during critical periods of the ebb and flood tidal cycle for water quality and water levels in the south Delta. During July through September, the maximum daily diversion limit from the Delta into the CCF is increased from 6,990 cfs to 7,490 cfs, and the maximum averaged diversion limit over any three days is increased from 6,680 cfs to 7,180 cfs. Banks Pumping Plant could pump up to 195,000 af for the CVP in accordance with the 2018 COA Addendum.

From mid-December to mid-March (assumed December 15 to March 15) DWR operates to a U.S. Army Corps of Engineers notice that allows for CCF diversions to increase above 6,680 cfs. During this window CCF diversions can increase by one-third of the San Joaquin River flow at Vernalis.

2.3.2 Expansion of the CCF Increased Winter Diversion Window

DWR proposes to expand the period when diversions into CCF may be increased by one-third of the San Joaquin River flow at Vernalis to December 1 through March 31 when those flows exceed 1,000 cfs. DWR will seek concurrence from the USACE that this expansion of the CCF diversion window is consistent with Section 10 of the Rivers and Harbors Act and will not affect navigation in the Sacramento or San Joaquin rivers, or the Delta.

2.3.3 Old and Middle River Flow Management

Old and Middle River (OMR) flow management addresses entrainment of adult Delta Smelt, larval and juvenile Delta Smelt, adult Longfin Smelt, larval and juvenile Longfin Smelt, winter-run Chinook Salmon juveniles, and spring-run Chinook Salmon young-of-year and yearlings. OMR flows provide a surrogate indicator for how export pumping at Banks and Jones pumping plants influence hydrodynamics in the south Delta. An OMR flow index will be used to determine export limitations, as described in the sections below, and will be calculated using the equation provided in Hutton (2008). If an equation is developed that results in a better representation of OMR flows, and Reclamation, DWR, NMFS, USFWS, and CDFW agree, then that equation will replace the current OMR index calculation. DWR would coordinate with CDFW to determine if an ITP amendment would be required to implement a new equation.

2.3.3.1 Chinook Salmon Early Season Migration

Winter-Run Chinook Salmon

To minimize entrainment and salvage of early-migrating natural winter-run Chinook Salmon, DWR and Reclamation will ~~reduce~~ adjust exports to achieve a seven-day average OMR index no more negative than -5,000 cfs for seven consecutive days, to be assessed on the seventh day of the averaging period after initiating operational changes in response to an OMR trigger, when the genetically verified seven-day rolling sum of winter-run Chinook Salmon loss, calculated daily, exceeds the following thresholds (see calculation details in Appendix 2C):

- From November 1 through November 30: 0.0044 percent (e.g., WY 2023) of the Red Bluff juvenile winter-run Chinook Salmon brood year total at the end of the second biweekly period in October.
- From December 1 through December 31: 0.0084 percent (e.g., WY 2023) of the Red Bluff juvenile winter-run Chinook Salmon brood year total estimated at the end of the second biweekly period in November.

If the seven-day rolling sum of winter-run Chinook Salmon loss, calculated daily, is exceeded during a period of reduced exports, DWR and Reclamation will continue to ~~reduce~~ adjust exports to achieve a seven-day average OMR index no more negative than -5,000 cfs ~~until seven days after the most recent exceedance~~. The projects will assess OMR on the seventh day of the averaging period after initiating operational changes in response to the OMR trigger.

DWR initially will restrict exports in response to meeting the thresholds above based on ~~initial~~ length-at-date identification of natural older juvenile Chinook Salmon. If genetic analysis of natural juvenile Chinook Salmon observed in salvage at the SWP or CVP indicates that any given Chinook Salmon is not a genetically confirmed winter-run Chinook Salmon, these fish will not count toward the loss threshold exceedance, and continued export restrictions pursuant to the OMR limit are not required. While a new, more rapid genetic method, SHERLOCK (Baerwald et al. 2023), undergoes field testing, it and the current genetic method, GT-seq (Campbell et al. 2014), will be used to determine the final identification. In the event that SHERLOCK and GT-seq provide different run assignments, the results from the GT-seq method will be used to determine the final run assignment for the purposes of implementing this early season migration action.

Spring-Run Chinook Salmon

Reclamation and DWR, through SaMT, will use real-time monitoring data, relevant tools, and new science gained through ongoing efforts to develop a spring-run juvenile production estimate and life cycle model to inform weekly risk assessments (October through June) for natural-origin juvenile spring-run Chinook Salmon. If the risk assessment identifies a more positive OMR flow requirement is needed to minimize take of natural-origin juvenile spring-run Chinook Salmon, the Water Operations Management Team (WOMT) may consider a more positive OMR flow requirement.

2.3.3.2 Start of OMR Management

The OMR management season starts any time after December 1 if an Adult Longfin Smelt Entrainment Protection Action is implemented, if appropriate (see Section 2.3.3.3, "Real-Time Adjustments"), if a First Flush Action occurs (i.e., immediately following completion of the First Flush Action) or any time after December 20 if the turbidity threshold in the Adult Delta Smelt Entrainment Protection Action is reached. If neither the Adult Longfin Smelt Entrainment Protection Action nor First Flush Action occurs nor the Adult Delta Smelt Entrainment Protection Action is reached, the OMR management season starts automatically on January 1. Once initiated, the OMR index on a 14-day running average will be no more negative than -5,000 cfs until the end of the OMR management season. The projects will assess compliance with the 14-day average OMR beginning on the 14th day of the averaging period after initiating operational changes in response to the initiation of the OMR management season. ~~A reduction in~~ An adjustment to exports to achieve a new OMR index will occur within three days of an action that requires a change in OMR.

First Flush Action: to minimize SWP and CVP influence on the movement of Delta Smelt and potentially other listed fish species into the south Delta, DWR and Reclamation will ~~reduce~~ adjust CVP and SWP exports for 14 consecutive days, anytime between December 1 and the last day of February, to maintain a 14-day average OMR index no more negative than -2,000 cfs within three days of when the following criteria are met:

- Three-day running average of daily flows at Freeport is greater than, or equal to, 25,000 cfs, and
- Three-day running average of daily turbidity at Freeport is greater than, or equal to, 50 Formazin Nephelometric Units (FNU)

The Projects will assess compliance with the 14-day OMR action on the 14th day of the averaging period after initiating operational changes in response to the OMR trigger. These criteria will be evaluated using data from the CDEC Sacramento River at Freeport station. The First Flush Action may only be initiated once each water year. The First Flush Action is exempt from the high-flow offramps as outlined below.

DWR and Reclamation, through WOMT, may prepare an assessment to initiate the First Flush Action early if real-time monitoring of abiotic and biotic factors and salvage prediction models indicates the First Flush Action is likely to be triggered (i.e., within two to three days) and Delta Smelt salvage is possible.

DWR and Reclamation recognize that readings at individual turbidity sensors or localized groups of turbidity sensors can generate spurious results in real time. To avoid triggering an OMR flow action during a sensor error or a localized turbidity spike that might be caused by local flows or a wind-driven event, DWR and Reclamation will consider and review data from other locations. In the event that the three-day running average of daily turbidity at Freeport is 50 FNU (or greater), and DWR and Reclamation believe that a First Flush Action is not warranted based on additional data sources, DWR and Reclamation will provide the additional data to the SMT and request they convene to confirm criteria will be met because of increased precipitation rather than sensor error or localized turbidity spike. If it is determined through WOMT that there is sensor error or a localized turbidity spike, DWR and Reclamation will take no additional action and provide the supporting information to USFWS and CDFW within 24 hours.

An adjustment to exports to achieve a new OMR index will occur within three days of an action that requires a change in OMR. The projects will evaluate compliance with any OMR action beginning on the last day of the OMR action's averaging period after initiating operational changes in response to the OMR trigger.

Once an OMR action is triggered, combined project exports will not be increased, except as scheduled prior to the trigger with notice to WOMT, in a manner that would make projected OMR more negative. Export adjustments to meet the conditions of the trigger will be done using the normal scheduling procedure. Combined projected exports, export scheduling, and OMR will be discussed at WOMT each week. The intent is that combined project exports will not increase the risk to protected fish species after an OMR trigger is met.

2.3.3.3 Real-Time Adjustments

DWR and Reclamation will manage exports to maintain a more positive OMR index than -5,000 cfs on a 14-day average under the following conditions:

Adult Delta Smelt Entrainment Protection Action (Turbidity Bridge)

The purpose of this action is to minimize adult Delta Smelt entrainment risk by reducing exports during periods when turbidity is elevated in the south Delta resulting in habitat conditions that support movement of Delta Smelt from the lower San Joaquin River into the south Delta and toward the export facilities (Smith et al. 2021). If, after a First Flush Action or after December 20, whichever occurs first, daily average turbidity remains or becomes elevated to 12 FNU or higher at each of three turbidity sensors in the OMR corridor creating a continuous bridge of turbidity from the lower San Joaquin River to the CVP and SWP export facilities, DWR and Reclamation will ~~manage~~ adjust exports to achieve a five-day average of the OMR index that is no more negative than -3,500 cfs, until the daily average turbidity in at least one of the three turbidity sensors is less than 12 FNU for two consecutive days, thereby indicating a break in the continuous bridge of turbidity. The three turbidity sensors are Old River at Franks Tract near Terminous (OSJ), Holland Cut (HOL), and Old River at Bacon Island (OBI).

If the three turbidity sensors remain over 12 FNU at the end of a High Flow Off-Ramp or any time after five consecutive days, then Reclamation and DWR, through the ~~Water Operations Management Team (WOMT)~~ WOMT, may prepare an assessment to determine if another Adult Delta Smelt Entrainment Protection Action is warranted based on continued entrainment risk following the period of elevated flows and whether Delta Smelt distribution has shifted downstream, as informed by available quantitative tools and real-time data.

The Adult Delta Smelt Entrainment Protection Action ends when the three-day continuous average water temperatures at Jersey Point or Rio Vista reach 53.6 degrees Fahrenheit (°F) (12 °C).

When the daily average San Joaquin River flows at Vernalis are greater than 10,000 cfs, the Adult Delta Smelt Entrainment Protection Action (Turbidity Bridge) is offramped. While offramped, the OMR index will be managed to no more negative than –5,000 cfs on a 14-day average. The Adult Delta Smelt Entrainment Protection Action (Turbidity Bridge) would be immediately reinstated when the daily average San Joaquin River flows at Vernalis drop below 8,000 cfs.

Adult Longfin Smelt Entrainment Protection Action

If cumulative water year salvage of Longfin Smelt with fork length ≥ 60 mm at the CVP and SWP facilities exceeds the salvage threshold, where:

$$Salvage\ threshold = \left(\frac{San\ Francisco\ Bay\ Study\ Longfin\ smelt\ index}{20}\right) + 1$$

$$Salvage\ threshold = \frac{Age\ 1+\ Longfin\ Smelt\ index}{20} + 1$$

Where:

- The ~~San Francisco Bay Study~~ Age 1+ Longfin ~~smelt~~ Smelt index is calculated using age 1+ fish captured in the mid water trawl from the full San Francisco Bay Study sampling area (California Department of Fish and Game 1999). The index is additive for the months of August, September, October, November, and December. If December data are not available at the start of this action period, then the August to November threshold will be used until the December data are available.

Then:

- From December 1 to the start of the OMR management season, DWR and Reclamation shall ~~operate~~ adjust exports to achieve an OMR index no more negative than -5,000 cfs on a seven-day average for seven consecutive days, and then, if appropriate, initiate the start of OMR management season. During the seven-day period, WOMT may convene and determine if initiation of OMR management season is warranted. If WOMT determines initiating OMR management season is not warranted, the OMR management season does not begin at the conclusion of the seven-day period. If salvage of Longfin Smelt ≥ 60 mm continues following the seven-day period where the OMR index is no more negative than -5,000 cfs, then DWR and Reclamation, through WOMT, may prepare an assessment to determine if additional Longfin Smelt entrainment protection action is warranted based on continued entrainment risk, as informed by available quantitative tools and real-time data. WOMT may determine if OMR management should be initiated. If WOMT does not meet, then protections will be initiated.
- From the start of the OMR management season to the end of February, DWR and Reclamation ~~shall operate~~ shall adjust exports to achieve an OMR index no more negative than -3,500 cfs on a seven-day average for seven consecutive days. If salvage of Longfin Smelt ≥ 60 mm continues following the seven-day period where the OMR index is no more negative than -3,500 cfs, then Reclamation and DWR, through WOMT, may prepare an assessment to determine if additional Longfin Smelt Entrainment Protection Action is warranted based on continued entrainment risk, as informed by available quantitative tools and real-time data.

Larval and Juvenile Delta Smelt Protection Action

Larval and juvenile Delta Smelt protections start upon the end of the Adult Delta Smelt Entrainment Protection Action. DWR and Reclamation will ~~operate~~ adjust south Delta exports to achieve a seven-day average of the OMR index no more negative than -5,000 cfs when the average Secchi disk depth in the most recent survey is greater than 1 meter. The Secchi disk depth will be calculated as the average measurement from all sampled stations on the San Joaquin River upstream of Jersey Point and stations south of the lower San Joaquin River. If the average Secchi disk depth in the most recent survey is less than 1 meter, then DWR and Reclamation will ~~operate~~ adjust exports to achieve an OMR index no more negative than -3,500 cfs until the average Secchi depth has increased to more than 1 meter. The SWP and CVP will operate to whichever of these OMR thresholds is appropriate given the latest Secchi disk depth data until the end of OMR management season.

Larval and Juvenile Longfin Smelt Protection Action

From January 1 through the end of OMR management season (see below), if:

- The seven-day average Qwest[2] is < +1,500 cfs, and;
- Larval and juvenile Longfin Smelt catch in the most recent Smelt Larval Survey (SLS) or 20-mm survey at stations 809 and 812 exceeds the catch threshold set by the ~~San Francisco Bay Study~~ Age 1+ Longfin Smelt index (see Table 2-4 for catch thresholds).

DWR and Reclamation will ~~restrict the~~ adjust exports to achieve a seven-day average OMR index ~~to~~ no more negative than -3,500 cfs for seven days. ~~DWR and Reclamation, through WOMT, may prepare an assessment to determine if the seven-day action can be adjusted or off-ramped based on larval and juvenile Longfin Smelt entrainment risk, as informed by available quantitative tools and real-time data.~~ Upon initiation of the action, DWR and Reclamation may conduct a risk assessment to evaluate risk of continued salvage and entrainment for discussion in WOMT at the end of seven days. This OMR action may be offramped based on this risk assessment following discussion in WOMT. If ~~off-ramped~~ offramped, the action can later be retriggered if conditions warrant.

If the water year cumulative juvenile Longfin Smelt salvage at the CVP and SWP facilities exceeds 50 percent of the average annual salvage observed from 2009 through the water year preceding the current water year, then DWR and Reclamation shall ~~operate to~~ adjust exports to achieve a seven-day average of the OMR index of -3,500 cfs for 14 days. If the water year cumulative juvenile Longfin Smelt salvage at the CVP and SWP facilities during this period exceeds 75 percent of the average annual salvage observed from 2009 through the water year preceding the current water year, then DWR and Reclamation shall ~~operate to~~ adjust exports to achieve a seven-day average of the OMR index of -2,500 cfs for 14 days. If salvage of larval and juvenile Longfin Smelt continues following the 14-day period where the OMR index is no more negative than -2,500 cfs, then WOMT may request advice from the SMT on an appropriate OMR index through the remainder of the larval and juvenile Longfin Smelt entrainment protection period. Consideration of the inclusion of Longfin Smelt abundance metrics in these salvage triggers will be addressed under Adaptive Management.

[2] Calculated using the Dayflow QWest equation.

Table 2-4. ~~San Francisco Bay Study~~ Age 1+ Longfin Smelt Index Catch Threshold

~~San Francisco Bay Study~~ Age 1+ Longfin Smelt Index	Catch Threshold at 809 & 812
0-149	10
150-299	20
300-499	30
500-999	40
≥1000	50

High-Flow Offramps for Larval and Juvenile Delta Smelt and Longfin Smelt

When the daily average Sacramento River flows at Rio Vista are greater than 55,000 cfs, or the daily average San Joaquin River flows at Vernalis are greater than 8,000 cfs, then the Larval and Juvenile Delta Smelt and Longfin Smelt Protection Actions are offramped. While offramped, the OMR index will be managed to no more negative than -5,000 cfs on a 14-day average. The Larval and Juvenile Delta Smelt and Longfin Smelt Protection Actions would be immediately reinstated when the daily average Sacramento River flows at Rio Vista drop below 40,000 cfs or the daily average San Joaquin River flows at Vernalis drop below 5,000 cfs. Rio Vista flows are calculated from the Dayflow equation and reported in the daily DWR Delta Hydrologic Conditions Report.

Winter-Run Chinook Salmon Annual Loss Threshold

DWR and Reclamation will adjust exports to manage the OMR index to avoid exceeding the following annual loss thresholds:

- Natural-origin winter-run Chinook Salmon (loss = 0.5 percent of Juvenile Production Estimate [JPE])
- Hatchery-origin winter-run Chinook Salmon (loss = 0.12 percent of JPE)

JPEs and annual loss thresholds will be calculated for natural-origin winter-run Chinook Salmon and for hatchery-origin winter-run Chinook Salmon from Livingston Stone National Fish Hatchery (LSNFH) released into the Sacramento River near Redding and LSNFH hatchery origin winter-run Chinook Salmon releases into Battle Creek. The JPE for natural and hatchery-origin winter-run Chinook Salmon will be calculated by the JPE Subteam annually, consistent with Appendix 2C, and will be described in the yearly recommendation letter produced by the JPE Subteam and transmitted to NMFS and CDFW. NMFS and CDFW will issue an Annual JPE Letter with the JPE Subteam recommendation included from CDFW as an enclosure to the letter. Hatchery releases of winter-run Chinook Salmon will be tracked individually, and cumulative loss, confirmed by coded wire tag (CWT), will be summed across release groups with the same JPE and annual loss threshold.

Annual loss of natural and hatchery-origin winter-run Chinook Salmon at the CVP and SWP salvage facilities will be counted for each brood year, starting July 1 of the calendar year through June 30 of the following calendar year. If cumulative loss of either natural or hatchery-origin winter-run Chinook Salmon in a brood year exceeds 50 percent of the annual loss thresholds, then DWR and Reclamation will ~~restrict~~ adjust south Delta exports to ~~maintain~~ achieve a seven-day average of the OMR index no more negative than -3,500 cfs for seven consecutive days. Once the cumulative loss is exceeded, each winter-run Chinook Salmon observed in salvage would trigger another operation to an OMR index limit of -3,500 cfs for seven days.

If the cumulative loss of either natural or hatchery-origin winter-run Chinook Salmon in a brood year exceeds 75 percent of the annual loss thresholds, then DWR and Reclamation will restrict south Delta exports to maintain a seven-day average OMR index no more negative than the -2,500 cfs for seven consecutive days when the Winter-Run Chinook Salmon Machine Learning Model and associated OMR Conversion Tool predict that the change to -2,500 cfs will shift the model output to a classification of absence with a minimum probability of absence prediction of 0.559 for 1 of 30 sub-models for any of the seven most recent prediction days. These prediction values are calculated based on length-at-date and will be updated once genetic analysis is fully adopted. Once the cumulative loss is exceeded, each winter-run Chinook Salmon observed in salvage would trigger another operation to an OMR index limit of -2,500 cfs for seven consecutive days when the Winter-Run Chinook Salmon Machine Learning Model and associated OMR Conversion Tool predict that the change to -2,500 cfs will shift the model output to a classification of absence with a minimum probability of absence prediction of 0.559 for 1 of 30 sub-models for any of the seven most recent prediction days.

If the cumulative loss of either natural or hatchery-origin winter-run Chinook Salmon in a brood year exceeds 100 percent of the annual loss thresholds, then DWR and Reclamation will immediately convene the Salmon Monitoring Team to review recent fish distribution information and operations and provide advice regarding future planned SWP and CVP operations to minimize subsequent loss during that year. The Salmon Monitoring Team will report the results of this review and advice to the Water Operations Management Team. Operational decisions will be made following the process described in Section 2.3.22, "Governance." If either annual loss threshold is exceeded, DWR and Reclamation will also convene an independent panel to review SWP and CVP operations and the annual loss thresholds prior to November 1. The purpose of the independent panel is to review the actions and decisions contributing to the loss trajectory that led to an exceedance of an annual loss threshold, and make recommendations on modifications to SWP and CVP operations, or additional actions to be conducted to stay within the annual loss thresholds in subsequent years.

DWR and Reclamation, initially, will ~~restrict~~ adjust exports in response to meeting the above thresholds based on the initial length-at-date identification of natural-origin older juvenile Chinook Salmon and the thresholds described above. If genetic analysis of natural-origin older juvenile Chinook Salmon observed in salvage at the SWP or CVP subsequently indicates that any given Chinook Salmon is not genetically identified as a winter-run Chinook Salmon, these fish will not count towards the loss threshold exceedance, and continued export restrictions pursuant to the OMR index limit are not required. While the new method, SHERLOCK, undergoes field testing, both it and the current GT-seq method will be used to determine the final identification. In the event that SHERLOCK and GT-seq provide different run assignments, the results from the GT-seq method will be used to determine the final run assignment.

Winter-Run Chinook Salmon Weekly Distributed Loss Threshold

To minimize the potential for a disproportionate impact of entrainment on any single week of natural-origin winter-run Chinook Salmon present in the Delta, DWR and Reclamation will manage the OMR index based on a weekly distributed loss threshold. There is no weekly distributed loss for hatchery-origin winter-run Chinook Salmon because they generally move through the Delta quickly.

The weekly loss threshold is a product of the weekly percentage of natural-origin winter-run Chinook Salmon present in the Delta, scaled to 100 percent (Table 2-5, Column E), and 50 percent of the natural-origin winter-run Chinook Salmon annual loss threshold.

If the weekly distributed loss threshold is exceeded on any single day by the seven-day rolling sum of winter-run Chinook Salmon loss, then DWR and Reclamation will ~~reduce~~ adjust exports to achieve a seven-day average OMR index no more negative than -3,500 cfs for seven consecutive days.

The averaging period for the OMR index will begin within three days of a criterion being exceeded.

If a JPE is not available at the start of OMR management, then the Red Bluff Diversion Dam brood year total from the most recent bi-weekly period will be used and applied, as described for early season management. If a fish is not genetically identifiable or if genetic identification is pending, then the length-at-date identification will be used to classify the race of the juvenile Chinook Salmon in salvage.

Weekly thresholds will be based on historical distribution (Table 2-5, Column E) of genetically identified winter-run Chinook Salmon from 2017 through 2021 and will change every week (e.g., January 1–7, January 8–15). Each week, DWR and Reclamation, through SaMT, will compare weekly Delta entry and exit information to determine if the present data are distributed similarly to the historical distribution data. DWR and Reclamation, through SaMT, may adjust subsequent weekly loss thresholds based on year-specific conditions. At the conclusion of the OMR management season, DWR and Reclamation will review and may adjust the historical distribution table, through SaMT, for the following year.

DWR and Reclamation, initially, will ~~restrict~~ adjust exports in response to meeting the above thresholds based on the initial length-at-date identification of natural-origin older juvenile Chinook Salmon and the thresholds described above. If genetic analysis of natural-origin older juvenile Chinook Salmon observed in salvage at the SWP or CVP subsequently indicates that any given Chinook Salmon is not genetically identified as a winter-run Chinook Salmon, these fish will not count towards the loss threshold exceedance, and continued export restrictions pursuant to the OMR index limit are not required. While the new method, SHERLOCK, undergoes field testing, both it and the current GT-seq method will be used to determine the final identification. In the event that SHERLOCK and GT-seq provide different run assignments, the results from the GT-seq method will be used to determine the final run assignment.

Table 2-5. Historical (Water Years 2017–2021) Presence of Winter-Run Chinook Salmon Entering the Delta (Column B), Exiting the Delta (Column C), in the Delta (Column D = Column B–Column C) and in the Delta Scaled to 100% (Column E)

Week (Starting January 1) (A)	Historical Cumulative entering the Delta (Sherwood Harbor) (B)	Historical Cumulative exiting the Delta (Chipps Island) (C)	Historical Present in the Delta (D)	Historical Present in the Delta (Scaled to 100%) (E)
1/1–1/7	2.47%	1.65%	0.82%	0.32%
1/8–1/14	2.47%	1.65%	0.82%	0.32%
1/15–1/21	4.94%	1.65%	3.29%	1.30%
1/22–1/28	4.94%	1.65%	3.29%	1.30%
1/29–2/4	19.75%	2.20%	17.55%	6.91%
2/5–2/11	38.27%	4.95%	33.32%	13.13%
2/12–2/18	43.21%	5.49%	37.72%	14.86%
2/19–2/25	46.91%	9.89%	37.02%	14.59%
2/26–3/4*	50.62%	18.13%	32.49%	12.80%
3/5–3/11	55.56%	30.77%	24.79%	9.77%
3/12–3/18	77.78%	38.46%	39.32%	15.49%
3/19–3/25	85.19%	64.84%	20.35%	8.02%
3/26–4/1	93.83%	90.11%	3.72%	1.47%
4/2–4/8	98.77%	99.45%	0.00%	0.00%
4/9–4/15	100.00%	100.00%	0.00%	0.00%
4/16–4/22	100.00%	100.00%	0.00%	0.00%
4/23– End of winter-run OMR Season	100.00%	100.00%	0.00%	0.00%

Notes: Data from genetically identified winter-run Chinook Salmon entering the Delta (Sherwood Harbor Trawl) and exiting the Delta (Chipps Island Trawl) are used to estimate the percentage of winter-run Chinook Salmon present in the Delta each week. Presence prior to January 1 each year is included in the first week of presence.

*The week of 2/26–3/4 includes eight days during leap years.

Steelhead Annual Threshold

In each year, DWR and Reclamation will manage exports to reduce loss at the CVP and SWP salvage facilities. To support survival and decrease entrainment loss, DWR and Reclamation will manage the OMR index to avoid exceeding the following annual loss threshold at CVP and SWP salvage facilities through the weekly distributed loss threshold described below.

Unclipped juvenile California Central Valley (CCV) steelhead loss = 3,000

Annual loss of unclipped juvenile CCV steelhead at the CVP and SWP salvage facilities will be counted cumulatively for each brood year, starting July 1 of the calendar year through June 30 of the following calendar year. Loss will be calculated for the south Delta export facilities using CDFW's steelhead loss multiplier until a loss method for steelhead is approved by CDFW and NMFS. This loss threshold will be used until a new loss threshold is developed through the steelhead JPE Special Study proposed in Reclamation's Biological Assessment for the long-term operation of the CVP and SWP.

Steelhead Weekly Distributed Loss Threshold

To minimize the potential for a disproportionate impact of entrainment of steelhead present in the Delta in any single week, DWR and Reclamation will manage OMR based on a weekly distributed loss threshold. The weekly loss threshold is the annual loss threshold distributed over the period of observed steelhead salvage between January 1 and June 30 using the seven-day weekly periods identified in the weekly distributed loss table for winter-run Chinook Salmon (Table 2-5), extended through June 30. DWR and Reclamation will reduce exports to achieve a seven-day average OMR index no more negative than -3,500 cfs for seven consecutive days when the seven-day rolling sum of steelhead salvage, calculated daily, exceeds the weekly loss threshold of 120 fish.

Spring-Run Chinook Salmon and Surrogate Thresholds

To provide additional minimization protection for emigrating natural juvenile spring-run Chinook salmon from the Sacramento River and tributaries, including the Feather and Yuba rivers, into the channels of the central Delta, south Delta, and into SWP and CVP south Delta pumping facilities, DWR and Reclamation will restrict exports based on the presence of hatchery produced spring-run and associated yearling late-fall-run and young-of-year fall-run Chinook Salmon surrogate groups at the CVP and SWP salvage facilities. DWR and Reclamation, in coordination with CDFW, NMFS, and USFWS through the SaMT, will select spring-run Chinook Salmon yearling and young-of-year surrogate groups. Yearling spring-run Chinook Salmon surrogates will be selected from late-fall-run Chinook Salmon in-river release groups from the Coleman National Fish Hatchery. Spring-run Chinook Salmon young-of-year and associated surrogate groups will be selected from fall-, and spring-run Chinook Salmon in-river release groups from the Feather River Fish Hatchery and Coleman National Fish Hatchery.

From November 1 through the end of the OMR flow management period of each water year, if a cumulative loss threshold is exceeded, Reclamation and DWR will ~~reduce~~ adjust south Delta exports to achieve a 7-day average OMR index of no more negative than -5,000 cfs for seven consecutive days in November and December, and no more negative than -3,500 cfs for seven consecutive days beginning January 1 (or whenever the OMR management begins) through the end of OMR flow management season, or June 30, whichever occurs first. The cumulative loss trigger for coded wire tagged (CWT) spring-run Chinook Salmon surrogate groups at the CVP and SWP salvage facilities is greater than 0.25 percent for each release group:

- Yearling spring-run Chinook Salmon surrogates: WOMT, with input from SaMT, will select three in-river releases of late-fall-run Chinook Salmon from Coleman National Fish Hatchery from November through February to use as yearling spring-run Chinook Salmon surrogates. Input from SaMT could include a proposal with several alternatives. If three in-river releases appropriately distributed from November through February are not achievable in a given year because of hatchery limitations, then an alternative plan will be developed to ensure the adequate characterization of natural yearling spring-run Chinook Salmon can still be achieved that year.
- Young-of-year spring-run Chinook Salmon surrogates: WOMT, with input from SaMT, will select six in-river releases comprised of spring-run and fall-run Chinook Salmon from the Feather River Fish Hatchery and fall-run Chinook Salmon from the Coleman National Fish Hatchery from March through May to use as young-of-year spring-run Chinook Salmon surrogates. Input from SaMT could include a proposal with several alternatives. If six in-river releases appropriately distributed from March through May are not achievable in a given year because of hatchery

limitations, then an alternative plan will be developed to ensure the adequate characterization of natural origin young-of-year spring-run Chinook Salmon can still be achieved that year.

The surrogate methods are intended to be an interim measure that will be replaced with a measure as described in Section 2.3.19.1, "Spring-Run Chinook Salmon Juvenile Production Estimate and Life Cycle Model."

2.3.3.4 Storm Flex

During the OMR management season, DWR and Reclamation, through WOMT, may prepare an assessment to evaluate operating to ~~an~~ a daily average of the OMR index no more negative than -6,250 cfs between the start of OMR management season and the Larval and Juvenile Delta Smelt Protection Action onramp or the last day of February, whichever occurs first, to capture peak flows during storm-related events when:

1. The Delta is in excess conditions as defined in the 1986 COA, as amended in 2018; and
2. QWEST[3] is greater than +1,500 cfs; and
3. X2 is < 81 km; and
4. The daily average turbidity at OSJ, HOL, and OBI sensors are < 12 FNU at each station; and
5. A Measurable precipitation event has occurred in the Central Valley; and
6. Reclamation and DWR determine that the net Delta outflow index indicates a higher level of outflow available for diversion due to peak storm flows; and
7. None of the additional real-time OMR protections are controlling SWP and CVP operations; and
8. Cumulative loss of the SWP and CVP export facilities of yearling Coleman National Fish Hatchery late-fall-run Chinook Salmon (yearling spring-run Chinook Salmon surrogate) is less than 0.5 percent within any of the release groups.

If the criteria above are met, WOMT will decide whether to request that DWR and Reclamation use estimates of the real-time distribution of listed-species from the SMT and SaMT, as well as particle tracking modeling and prediction tool output to assess potential listed-species entrainment risk differences using OMR inputs of -5,000 and -6,250 cfs. If the assessment indicates that no additional real-time OMR protections for the upcoming week are likely to be triggered, DWR and Reclamation will bring a request back to WOMT for approval to operate to an OMR index no more negative than -6,250 cfs and will update the assessment no less than weekly.

If conditions indicate an additional real-time OMR protection condition is likely to be triggered, DWR and Reclamation will ~~reduce~~ adjust south Delta exports to achieve a 14-day average OMR index no more negative than -5,000 cfs, unless a further reduction in exports is required. If an entrainment protection condition is triggered, DWR and Reclamation will cease storm-flex operations and implement the entrainment protection condition. Storm-flex decisions will be re-evaluated weekly by WOMT.

[3] Calculated using the Dayflow QWest equation.

2.3.3.5 End of OMR Management Season

OMR management season for Delta Smelt and Longfin Smelt will conclude when the water temperature at CCF (CDEC station CLC) is 77.0 °F (25 °C) or higher for three consecutive days, or on June 30, whichever occurs first.

DWR and Reclamation will conclude OMR management for salmonids on June 30 or when the following conditions have occurred, whichever occurs first:

- Daily mean water temperature at Mossdale has exceeded 72.0 °F (22.2 °C) for seven non-consecutive days (does not have to be consecutive) in June; and
- Daily mean water temperature at Prisoner's Point has exceeded 72.0 °F (22.2 °C) for seven non-consecutive days (does not have to be consecutive) in June.

2.3.3.6 End of Year Evaluation

Each year, DWR and Reclamation, in coordination with the SMT, will conduct an annual assessment of OMR protection measures for Delta Smelt and Longfin Smelt, which will include an evaluation of salvage, management actions, and physical conditions in a seasonal report. This seasonal report may support improvements, if necessary, to the OMR Guidance Document, and may also guide operations in the future[4].

Each year, DWR and Reclamation, in coordination with the Salmon Monitoring Team (SaMT), will conduct an annual assessment of OMR protection measures for winter-run Chinook Salmon, spring-run Chinook Salmon, and steelhead, which will include an evaluation of salvage, management actions, and physical conditions in a seasonal report. This seasonal report may support improvements, if necessary, to the OMR Guidance Document, and may also guide operations in the future.[4]

The seasonal report is anticipated to be used to fulfill reporting requirements in the ITP issued by CDFW and will support evaluation of the OMR-related components of the Adaptive Management Program described in Section 2.3.18, "Adaptive Management," Section 2.3.19, "Special Studies," and Appendix 2B. The OMR Guidance Document could be updated, and OMR operations could be altered based on recommendations of the Adaptive Management Teams and Adaptive Management Steering Committee. Changes to OMR operations could require an amendment to the ITP issued by CDFW.

[4] This seasonal report will fulfill commitments under the ROD that will be signed by Reclamation on the Consultation on the Coordinated Long-Term Operation of the CVP and SWP to produce a seasonal report each year. Additionally, this seasonal report will be used to support the development of Reclamation's Annual Report on the Long-Term Operation of the Central Valley Project and State Water Project. Finally, this seasonal report will inform any Four-Year Review Panels adopted under the ROD. The purpose of the independent review will be to evaluate the efficacy of actions undertaken to reduce the adverse effects on listed species.

2.3.4 White Sturgeon Protection Measures

DWR proposes to convene a sturgeon technical team and develop a series of studies (e.g., enhanced monitoring and life cycle model development) to better understand factors that influence White Sturgeon movement into the south Delta and SWP Clifton Court Forebay. The studies could evaluate the timing of emigration, emigration routes into the Delta, residence time in the Clifton Court Forebay, responses to a non-physical barrier, and other relevant studies. Under the adaptive management program, DWR and CDFW will utilize data from these studies to consider potential take reduction measures for implementation by 2027.

In the interim, DWR and CDFW will develop information that will form the basis of an operational assessment in the event of elevated entrainment risk that may lead to the implementation of a measure to reduce take at the SWP. Along with the development of information that will form the basis of an assessment, DWR and CDFW will develop information for what constitutes elevated entrainment risk, taking into account historical salvage, catch from the LTO monitoring programs, hydrologic conditions, and relative SWP and CVP salvage. DWR and CDFW will coordinate on the elevated entrainment risk and potential measures to reduce take before presenting the issue to WOMT for assessment. Any measure identified through this assessment must be capable of successful implementation, roughly proportional in extent to the impact of the SWP's take of White Sturgeon and supported by evidence.

In addition, the Yolo Notch Improvement project reduces stranding and poaching of adult White Sturgeon at the Fremont Weir. Operational reduction measures implemented for other species also may provide reduced entrainment risk for White Sturgeon.

2.3.5 Spring Delta Outflow

Spring Delta outflows are part of this Project, as well as the Voluntary Agreements. The Project incorporates components of the Healthy Rivers and Landscapes Program (formerly Voluntary Agreements [5]) to implement Spring Delta Outflow as set forth below in Section 2.3.5.1, "Voluntary Agreement Implementation." To the extent Project operations will be carried out before Voluntary Agreement implementation following approval by necessary entities, the Project incorporates an alternate approach to Spring Delta Outflow as described in Section 2.3.5.2, "Early Voluntary Agreement Implementation."

2.3.5.1 Voluntary Agreement Implementation

Voluntary Agreement measures that result in Delta Outflow, including during the spring period, will be achieved by a combination of SWP export reductions, water purchases made possible through the collection of diversion fees from SWP contractors, and third-party actions such as reductions in diversions by other water users throughout the watershed. As a component of Voluntary Agreement implementation, DWR will provide for Delta outflow under this proposed project through SWP export reductions and collection of diversion fees from SWP contractors to purchase water for Delta outflow per the terms of the Voluntary Agreements. DWR actions will generate water for Delta outflow volumes as follows for the benefit of native fish populations, including listed species, as set forth in Table 2-6. DWR will not be required to restrict exports at the Banks Pumping Plant below its minimum health and safety exports of 600 cfs to meet the flow volumes.

[5] The Voluntary Agreements are now referred to as the Healthy Rivers and Landscapes Program and the names are used interchangeably throughout this EIR.

Table 2-6. Water Made Available by the SWP Under the Voluntary Agreements During Each Water Year Type[1,2]

	Critical Water Years	Dry Water Years	Below Normal Water Years	Above Normal Water Years	Wet Water Years
SWP Forgone Exports[3]	0	62.5	62.5	87.5	0
Flow Purchases Acquired Through SWP Diversion Fees (implemented through forgone exports)[4]	0	30	30	30	
Flow Purchases Acquired Through SWP Diversion Fees (implemented through tributary inflow from the fallowing program[5] or to the extent flows are realized through market price purchases, from market price purchases[6])	0	50	50	50	0
Total Outflow Volumes	**0**	**142.5**	**142.5**	**167.5**	**0**

Notes:

[1] Water Year Types are based on the Sacramento River 40-30-30 Index

[2] Water volumes are reported in Thousands of Acre Feet (TAF)

[3] The numbers for "SWP Forgone Exports" are half of the volumes identified as "CVP/SWP Export Reduction" set forth in the Term Sheet, Appendix 1. Flow Tables. This flow volume will be met through cuts to SWP export of unstored water.

[4] The numbers for "Flow Purchases Acquired Through SWP Diversion Fees (implemented through forgone exports)" are the "SWP SOD" portion of the "PWA Water Purchase Program – Fixed Price" set forth in the Term Sheet, Appendix 1. Flow Tables.

[5] The numbers for "Flow Purchases Acquired Through SWP Diversion Fees (implemented through tributary inflow from the fallowing program . . .") are a portion of the volumes to be made available through fallowing identified as "Sacramento River Basin – Sacramento" and "Sacramento River Basin – Feather" set forth in the Term Sheet, Appendix 1. Flow Tables. This portion of the volumes to be made available through the fallowing program will be funded through financial commitments from the SWP contractors.

[6] The reference to "market price purchase program" refers to the "PWA Water Purchase Program – Market Price" set forth in the Term Sheet, Appendix 1. Flow Tables. The market price purchase program is expected to make 45 TAF of flows available for Delta outflow in Below Normal and Above Normal water year types, with half of the volume to be funded through purchases through SWP delivery fees (22.5 TAF in relevant year types). Flows made available through the market price purchase program would only be counted toward Delta outflow as a part of this Project to the extent that such flows are realized in any given year. The remainder of Flow Purchases Acquired Through SWP Diversion Fees (set forth in the above table) would be made available through tributary inflow from the fallowing program.

Delta outflow from DWR actions described above would be prioritized during the period of March 1 through May 31. DWR and CDFW will agree on appropriate accounting mechanisms, consistent with Voluntary Agreement implementation, before implementation of these actions.

Consistent with Voluntary Agreement Governance Enforcement Program and relevant Voluntary Agreement Implementing Agreements, DWR will confer with CDFW annually to develop a plan for deploying the Delta outflow volumes, including the mechanisms and timing for Delta outflow according to DWR's action above (Table 2-6). The outcome of this annual planning process will be reported to the Systemwide Governance Committee as part of larger annual planning and reporting for implementation of Voluntary Agreements. CDFW and DWR will begin meeting no later than January 15 of each year. DWR will submit a draft plan, accounting for the uncertainty of hydrologic conditions, to CDFW by March 1st for approval. As part of a specific component of the plan identifying DWR's annual action, the plan will identify the anticipated hydrology and operational SWP foregone exports and additional flows that will be implemented to achieve the total outflow

volumes identified above for the forecasted water year type. The plan will identify deployment to occur during the March 1 – May 31 period. The plan will be subject to revision, with CDFW approval to account for updated hydrologic conditions.

2.3.5.2 Early Voluntary Agreement Implementation

Early implementation Spring Delta outflow actions will be achieved through either one of the following:

1. Implementation of Condition of Approval 8.17 of DWR's 2020 Incidental Take Permit (2020 ITP), which states, in relevant part:

   "Permittee shall reduce exports from April 1 to May 31 each year to achieve the SWP proportional share (Condition of Approval 8.10) of export reductions established by the ratio of Vernalis flow (cfs) to combined CVP and SWP exports, scaled by water year type, to provide incidental spring outflow. In a critically dry year, the ratio of Vernalis flow to CVP and SWP combined exports shall be 1 to 1. In a dry year, the ratio of Vernalis flow to CVP and SWP combined exports shall be 2 to 1. In a below normal year, the ratio of Vernalis flow to CVP and SWP combined exports shall be 3 to 1. In an above normal or wet year, the ratio of Vernalis flow to CVP and SWP combined exports shall be 4 to 1. In wet years SWP export curtailments required by this Condition of Approval for spring outflow in April and May is limited to 150 TAF. The ratio of Vernalis flows to export reductions is intended to serve as an operational mechanism to achieve the Delta outflow required by this Condition of Approval for minimization of the Covered Activities' impacts to Covered Species.

   For purposes of this Condition of Approval only, the Joaquin Valley "60-20-20" Water Year Hydrologic Classification and Indicator as defined in the Bay-Delta Plan (State Water Resources Control Board 2006) is used.

   Permittee shall not be required to restrict operations as described above under either of the following circumstances:

   - If the three-day average of Delta outflow is greater than 44,500 cfs, then Project operations shall not be controlled by this Condition until the flows drop below 44,500 cfs on a three-day average.
   - Permittee shall not be required by this Condition of Approval to restrict exports at the Banks Pumping Plant below its minimum health and safety exports of 600 cfs."[6]

   Condition of Approval 8.17 recognizes ratio adjustments for multi-year droughts as outlined in the 2009 NMFS Central Valley Operations Biological Opinion.

2. Actions to generate flow volumes that are on average equivalent to implementation of the 2020 ITP Condition of Approval 8.17. If this latter approach is pursued, DWR and CDFW will meet and confer on the final operational plan that considers hydrology and accounting methods, and DWR will obtain CDFW approval of the operational plan prior to April 1st. This flow volume will be through cuts to SWP export of unstored water. DWR will not be required to restrict exports at the Banks Pumping Plant below its minimum health and safety exports of 600 cfs to meet the flow volumes.

[6] As used in 2020 ITP Condition of Approval 8.17, "Permittee" refers to DWR.

2.3.6 Delta Smelt Summer-Fall Habitat

2.3.6.1 Fall X2

To increase the amount of low-salinity zone habitat for Delta Smelt in wet and above normal hydrologic year types, DWR and Reclamation will maintain a 30-day average X2 ≤ 80 km from September 1 through October 31.

2.3.6.2 Suisun Marsh Salinity Control Gates

To address effects on critical habitat for juvenile Delta Smelt and increase habitat and food access for Delta Smelt in summer and fall (June through October) in Suisun Marsh and Grizzly Bay during above normal, below normal, and dry years following wet or above normal years, DWR will operate SMSCG for 60 days, to maximize the number of days that Belden's Landing three-day average salinity is equal to, or less than, 4 practical salinity units (psu) to maximize the spatial and temporal extent of Delta Smelt low salinity zone habitat in Suisun Marsh and Grizzly Bay. Operation of the SMSCG will occur between June 1 and October 31 in years which operation of the SMSCG is required. In dry years following below normal years, DWR will operate SMSCG for 30 days to maximize the number of days Belden's Landing three-day salinity is equal to, or less than 6 psu to maximize the spatial and temporal extent of Delta Smelt low salinity zone habitat in Suisun Marsh and Grizzly Bay. DWR and Reclamation, through the Delta Coordination Group (DCG), may prepare an assessment to propose an alternative gate operation if modeling of hydrological and/or existing D-1641 conditions indicate the action can achieve the same habitat benefits in an equal or better manner within the range of effects analyzed. Subsequently, DWR and Reclamation may propose alternative operations of the SMSCG for WOMT to consider prior to May 15 of each year a SMSCG action will be required. DWR and Reclamation, through the DCG, will develop a monitoring plan that responds to uncertainties in the performance metrics to evaluate action performance based on a schedule determined by the AMSC. DWR and Reclamation will also produce a report that summarizes monitoring findings and assess action performance based on a schedule determined by the AMSC. The Summer-Fall Habitat Action (SFHA) shall be included in independent reviews under the adaptive management program (Appendix 2B).

2.3.6.3 One-Time Water Commitment for Delta Outflow

As described in Condition of Approval 9.1.3 of DWR's 2020 ITP, each year, DWR shall prepare a plan to operate the SWP to achieve favorable habitat conditions for Delta Smelt in Suisun Marsh and Grizzly Bay during the summer and fall. This plan is referred to as the Summer-Fall Action Plan. The planning process investigates the extent to which providing flow and low salinity conditions of various volumes and locations improves the quality and quantity of Delta Smelt habitat and food in the summer and fall, and whether Delta Smelt survival, viability, and abundance improves in response to summer-fall operations.

One of the actions required by the 2020 ITP (Condition of Approval 8.19) includes release of 100 TAF for Delta Outflow during June through September of wet and above-normal water years, or October immediately following the end of that water year. However, if conditions are appropriate and it is approved by CDFW, DWR may defer and redeploy the additional 100 TAF Delta Outflow to supplement Delta Outflow in the following water year during the March through September period, or the October immediately following the end of that water year. The additional 100 TAF is not required to be deployed if the following water year is a critically dry water year. The Additional 100

TAF shall be stored in Oroville Reservoir and will be subject to spill from Oroville Reservoir if redeployed to the following year.

In the event that CDFW opts to use this block of water in 2025, DWR has committed to deploying a one-time block of water in 2025 during the summer-fall period for Delta Smelt habitat under the new ITP. DWR will work with CDFW to determine how the block of water would be deployed to meet biological goals, as identified by the DCG.

2.3.7 John E. Skinner Delta Fish Protective Facility

The Skinner Fish Facility minimizes losses resulting from entrainment at Banks Pumping Plant. DWR will operate the facility to capture fish entrained by Banks Pumping Plant. Salvage of fish occurs at the Skinner Fish Facility whenever Banks Pumping Plant is pumping. Fish are salvaged in flow-through holding tanks, monitored by a 30-minute fish count every 120 minutes, and transported by truck to release sites near the confluence of the Sacramento and San Joaquin rivers. Larval smelt sampling commences upon detection of a spent female at Tracy Fish Collection Facility or Skinner Fish Facility or when a temperature trigger of 53.6 °F (12 °C) at nearby CDEC stations is met. Salvage and operations data necessary to calculate loss are made available daily by 10 a.m. The standard operation procedures for the Skinner Fish Facility are included as Appendix 2A, Attachment 1.

To seek additional improvements to the Skinner Fish Facility, DWR proposes to develop an Alternative Loss Pilot Study Implementation Plan (ALPS-IP). The ALPS-IP would include a structured decision-making (SDM) process to develop and implement a pilot study that would include consideration of additional studies and salvage facility loss parameterization and, potentially, procedural modifications. DWR will proceed with the following items, Debris Management Effectiveness Study, and facility improvements evaluations as described below and on the timelines provided.

2.3.7.1 Maintenance and Repair

DWR will provide Reclamation and the fish agencies notice of salvage disruptions due to planned facility maintenance (planned outages) at least 24 hours in advance. To minimize and avoid salvage disruptions, DWR conducts most planned outages during full shutdowns of Banks Pumping Plant, frequently in the spring. Further, the modular design of the Skinner Fish Facility in conjunction with total export capacity reductions is used to avoid salvage disruptions for maintenance and repair activities. For unplanned facility maintenance, notice will be provided as soon as practicable. In the event of an unplanned outage (e.g., power disruption) extending beyond one hour, DWR will stop pumping, but may continue to operate the CCF radial gates.

2.3.7.2 Fish Protection Facility Operations Manual

DWR proposes to develop and implement a revised written training curriculum as identified in Section IV: Fish Identification, of the 2021 DWR CDFW Interagency Agreement for Fish Facilities Operation. Additionally, DWR proposes to annually review and update the revised Skinner Delta Fish Protective Facility Operations Manual after water year 2023, as specified in the manual. Skinner Fish Facility will have access to a staff biologist for consultation to support salvage staff, research studies, and special handling of tagged fish.

DWR will fund two full-time CDFW Environmental Scientist and one Senior Environmental Scientist, Specialist positions to work collaboratively with DWR Skinner Fish Facility staff.

2.3.7.3 Fish Protection Facility Improvements

DWR proposes to continue to screen fish from Banks Pumping Plant with the Skinner Fish Facility, located west of the CCF, 2 miles upstream of the Banks Pumping Plant. DWR proposes to continue refinement and improvement of the Skinner Fish Facility fish sampling procedures and infrastructure to improve the accuracy and reliability of data and fish survival by:

1. Implementation of the ALPS-IP as part of the Alternative Loss Equation Pilot Study, which would include an SDM process to prioritize potential additional data needs, additional facility improvements to support salvaged listed fish species survival, and more accurate estimates of loss and loss parameters at the SWP and CVP export facilities.
2. Minimization of impacts from debris and excessive numbers of fish, which would include:
    a. Continued implementation of the recently adopted fall herbicide application to CCF;
    b. An Effectiveness Study to analyze the effectiveness of CCF herbicide application on debris management procedures;
    c. If the results of the Effectiveness Study identify feasible additional improvements that require further development and/or prioritization, an SDM process may be utilized to develop improvement requirements including design criteria and/or procedures to implement the study recommendations (e.g. alternative methods of managing fish counts during periods of heavy debris and/or large numbers of fish); and
3. Implementation of updated training curricula as identified in Section 2.3.7.2, "Fish Protection Facility Operations Manual."

Within one year from the ROD or ITP, whichever is later, DWR will submit a draft Effectiveness Study Plan to agency sub-directors for approval. The Effectiveness Study plan will include a timeline for study completion, and an SDM process for alternatives development and design criteria development with participation from DWR, CDFW, NMFS, and USFWS. At the conclusion of the SDM process, the SDM recommendations will be submitted to the sub-directors for implementation, as needed. In the interim, the historical count length reduction procedures for managing heavy debris and/or large numbers of fish will be used.

2.3.7.4 Salvage Release Site Improvements

DWR will implement the ALPS-IP, which would include an SDM process to develop and implement a pilot study that would include consideration of additional studies and salvage release facility loss parameterization. DWR proposes to continue to coordinate with Reclamation to incorporate flexibility with salvage release site operations to improve fish survival.

2.3.8 Habitat Restoration

DWR and Reclamation have undertaken restoration projects to satisfy restoration requirements identified in the 2008 and 2019 USFWS BiOps (8,000 acres) and the 2020 State ITP (396.3) as mitigation requirements for operations-related impacts on Delta Smelt (USFWS BiOps) and Longfin Smelt (2020 ITP). Currently, 11 restoration projects have been identified to satisfy the total acreage requirement of 8,396.3 acres (Table 2-7). The 11 projects are in different phases of completion including: (1) constructed (3,584 acres), (2), in construction (3,490 acres) or (3) planned (1,322 acres). All 11 restoration projects are located in the northern arc of the upper estuary (area of highest Delta Smelt occupation) and are designed to enhance food production and rearing habitat for Delta Smelt and Longfin Smelt. These restoration projects also will provide benefits to rearing and emigrating winter-run and spring-run Chinook Salmon, as well as other native fishes. DWR and Reclamation will complete its 8,396.3-acre restoration requirements by 2026.

Table 2-7. Tidal Habitat Restoration

Project	Estimated Mitigation Acres	Phase
Arnold Slough	138	Constructed
Decker Island	113	Constructed
Lower Yolo Ranch	1,713	Constructed
Tule Red	590	Constructed
Winter Island	544	Constructed
Wings Landing	190	Constructed
Yolo Flyway Farms	296	Constructed
Bradmoor Island	490	Under construction
Lookout Slough	3,000	Under construction
Prospect Island	635	Planning, construction planned in 2024
Chipps Island	687	Planning, construction planned in 2024

The process and documentation for design, protection and long-term management of these sites is described in Appendix 2A, Attachment 2.

2.3.9 Delta Smelt Supplementation

Delta Smelt supplementation addresses the Allee effect in the baseline status of wild Delta Smelt. Too few Delta Smelt remain for effective breeding in the wild. In water year 2022, the University of California, Davis Fish Conservation and Culture Laboratory raised 55,733 fish that were released into the wild as part of experimental releases. Experimental releases are currently planned through water year 2025. The four years of experimental releases (water years 2022–2025) entail experimental learning about the logistics and mechanisms of transport and release, with the intent to inform the design and implementation of supplementation.

USFWS ran a simulation using an updated version of the life cycle model described by Smith et al. (2021) to estimate the probability that different release levels would result in wild Delta Smelt populations high enough to support the Fish Conservation and Culture Laboratory's broodstock collection efforts. Results indicate that an annual release of 150,000–175,000 fish is needed to have a greater than 50 percent chance of meeting the collection target. DWR and Reclamation will support a minimum planned production of 150,000 fish by water year 2025, and a minimum of 200,000 fish by water year 2026, if feasible, that are at least 200 days post-hatch or equivalent.

DWR and Reclamation, through the Culture and Supplementation of Smelt Steering Committee (CASS SC), will continue to collaborate with USFWS and CDFW on the development of a program to conduct supplementation of the wild Delta Smelt population with propagated fish consistent with USFWS' Supplementation Strategy (Appendix 2E). USFWS and CDFW will update the Supplementation Strategy in coordination with DWR and Reclamation, with the next update expected in 2025. DWR and Reclamation will, together with USFWS and CDFW, implement the supplementation program through a collective management structure consistent with the Supplementation Strategy and the SWP/CVP governance structure and the Adaptive Management Plan (Appendix 2B). Supplementation governance will consist of the CASS SC and several collaborative technical teams charged with implementation of all aspects of supplementation (e.g., fish culture, transportation and release, monitoring, synthesis, etc).

The Supplementation Strategy also identifies a need for additional facilities and evaluation of new approaches to maintain these fish, support supplementation, improve transportation and release of fish, maximize genetic diversity, and minimize domestication effects. An existing Master Plan for a new Delta Smelt Conservation Facility Fish Technology Center (U.S. Fish and Wildlife Service 2018) is currently being revisited and further developed to a 35-percent design-level plan, with completion expected 2024. Additional facilities would require subsequent environmental compliance documentation for their construction and eventual operation. DWR and Reclamation will collaborate with USFWS and CDFW for the additional development of this planning effort, incorporation into the USFWS Supplementation Strategy (U.S. Fish and Wildlife Service 2020), and the construction and operational needs of facilities capable of meeting production of 400,000–500,000 fish that are at least 200 days post-hatch by water year 2030.

DWR will fund a full-time position for a biologist to coordinate with and support CDFW's supplementation efforts.

2.3.10 Longfin Smelt Culture Program

The Longfin Smelt Culture Program aims to establish and maintain a robust, genetically managed captive population for the imperiled Longfin Smelt. The Longfin Smelt culture program has two primary goals: 1) to buffer against extinction and 2) to provide a source of fish for research, as guided by the Longfin Smelt Science Plan. Due to this importance, Longfin Smelt culture was identified as a science priority in the 2020 ITP.

Attempts at culturing Longfin Smelt were first initiated at the UC Davis Fish Conservation and Culture Lab (FCCL) during the 2010-2011 Longfin Smelt spawning season. Adult brood stock have since been collected annually whenever available from the U.S. Fish and Wildlife Service (USFWS) Chipps Island Trawl, the UC Davis Otolith Geochemistry & Fish Ecology Laboratory, and DWR. With support from DWR, the first successful crosses of cultured fish occurred in the spring of 2023.

Unlike Delta Smelt and salmonids, the San Francisco Bay-Delta Distinct Population Segment (DPS) of the Longfin Smelt lack a refugial population to buffer against the stressors that the species continues to face. Additionally, successfully culturing Longfin Smelt would provide a more thorough understanding of the species life history, thereby improving its management. Cultured fish could also provide further information on reproduction, growth, response to stressors such as suboptimal water quality and feed preferences. This type of information is a critical need for the development of life cycle models, and to identify habitat requirements that could be addressed through management actions (e.g. flow, restoration, etc.). Longfin Smelt culture would also allow for further field and lab

studies to support management. One of the bottlenecks in evaluating the effects of management actions on Longfin Smelt is that their numbers are low and take authorization could limit the implementation of additional field sampling. Cultured fish therefore allow us to use laboratory and field approaches (e.g. enclosures) to understand how the species' physiology, ecology, and genetics respond to different environmental variables and management actions.

DWR will continue to fund the Longfin Smelt culture program to achieve the following objectives: 1) fully close the Longfin Smelt life cycle in captivity, 2) initiate and maintain a genetically managed refugial population, and 3) produce fish to meet the needs of research and management projects as coordinated with the Longfin Smelt Science Plan.

2.3.11 Water Transfers

Water transfers assist California urban areas, agricultural water users, and others in meeting their water needs. DWR and Reclamation will operate the SWP and CVP to facilitate transfers by providing water in streams for delivery to alternative diversion points, conveying water across the Delta for export, or storing water for delivery at a future time.

Out-of-basin transfers (e.g., Long Term Water Transfer Program, North to South-of-Delta Transfers), follow the *Draft Technical Information for Preparing Water Transfer Proposals, as updated in 2019* (California Department of Water Resources and U.S. Bureau of Reclamation 2019a; Water Transfers White Paper). The actions taken by contractors to make water available for these transfers (i.e., reducing consumptive use by crop idling, contractor reservoir releases, or groundwater substitution) have separate ESA section 7 consultations and CESA permitting processes, and are not part of this proposed project. However, the specific timing and operations associated with the movement of the water to be transferred is a component of this proposed project although it is not being modified by this proposed project.

DWR and Reclamation will provide a transfer window across the Delta from July 1 through November 30. When pumping capacity is needed for CVP or SWP water, DWR and Reclamation may restrict transfers. Maximum transfers are shown in Table 2-8 below.

Table 2-8. Proposed Annual North to South (out of basin) Water Transfer Volume

Water Year Type	Maximum Transfer Amount North to South
Critical	Up to 600
Dry (following critical)	Up to 600
Dry (following dry)	Up to 600
All other years	Up to 360

Note: taf = thousand acre-feet

In general, a north to south water transfer involves an agreement between a willing seller and a willing buyer to use available infrastructure capacity to convey water between the parties. To make water available for transfer, the willing seller must take an action to reduce the consumptive use of water or release additional water from reservoir storage. This water is then conveyed to the buyers' service area for beneficial use.

DWR and Reclamation frequently transfer project and non-project water supplies through CVP and SWP facilities, including in-basin and out of basin transfers. The quantity and timing of a specific water transfer may or may not require operational changes to both CVP and SWP reservoir releases and CVP and SWP facilities pumping.

2.3.12 Georgiana Slough Salmonid Migratory Barrier Operations

DWR proposes to annually install and operate the Bio-Acoustic Fish Fence™ (BAFF) at the divergence of Georgiana Slough and the Sacramento River from 2023 until ~~2030~~ the end of the requested duration of the ITP Application (i.e., 10 years) . The BAFF will be used as a behavioral deterrent for juvenile listed salmonids from entering Georgiana Slough and, ultimately, the interior Delta during outmigration. DWR proposes to construct and ~~remov~~ remove the barrier each year in the Sacramento River at Georgiana Slough and operate it following the closure of the Delta Cross Channel gates in the winter, or no later than January 1, through April 30. BAFF operations in additional months, November, December, and May, will be adaptively managed each year by DWR in coordination with CDFW, NMFS, and USFWS. DWR will update and operate to the Georgiana Slough Salmonid Migratory Barrier Operations Plan (Appendix 2F) and associated operating criteria in collaboration with CDFW, USFWS, and NMFS under the Adaptive Management Program (Appendix 2B) to maximize benefits to migrating winter-run and spring-run Chinook Salmon.

The BAFF is a multi-stimulus fish barrier, combining high-intensity light-emitting diode (LED) modulated intense lights (MILs), an air bubble "curtain," and sound. The BAFF sound is trapped by refraction within the bubble curtain, producing a sharply defined sound field that fish detect when within a few meters of the barrier. The flashing MILs are aligned such that the light beam projects onto the bubble curtain, helping to identify the bubbles so that the source of the sound can be determined by the fish, while minimizing light saturation within the experimental area.

A Delta Survival Study, consisting of acoustically tagging and releasing hatchery-reared juvenile Chinook salmon and/or steelhead per year, will be undertaken to assess the routing probability at the Georgiana Slough junction for tagged juvenile salmonids. Additionally, up to 200 predatory fish may also be captured, tagged, and released which would provide additional information on whether there is an effect of BAFF presence and operation on predation. The goal of installing and operating the BAFF are to provide a higher probability of survival for out-migrating juvenile salmonids that encounter the Georgiana Slough junction and to reduce the entrainment of juvenile salmonids into the interior Delta. Previous studies have shown that BAFF operations in 2011/2012 reduced the number of juvenile salmonids from entering Georgiana Slough by one half to two-thirds of the acoustically tagged fish. Preliminary data collected in 2024 using acoustic tagged hatchery-reared late-fall and winter run Chinook salmon, indicate the probability of fish staying in the mainstem Sacramento River was between 82.1% and 91.6%.

DWR prepared an Initial Study/Proposed Mitigated Negative Declaration (State Clearinghouse Number 2021100009) and obtained an ITP (No. 2081-2021-102-03) for the annual installation, operation of equipment used to generate air bubbles and light emissions (e.g., generators), and maintenance of the BAFF. Potential effects of the operation of the BAFF are evaluated in this EIR.

2.3.13 Agricultural Barriers

Agricultural barriers maintain water levels for south Delta agricultural diverters. DWR has renewed the permit from USACE for the installation of three agricultural barriers in the south Delta through September 2029 (SPK-1999-00715). DWR may install barriers as early as May 1 in Old River near Tracy 0.5 mile upstream of the Tracy Fish Collection Facility; in Middle River 0.5 mile upstream of the junction with Victoria Canal; and in Grant Line Canal about 400 feet upstream of the Tracy Boulevard Bridge. All barriers will be removed by November 30 each year.

Operation of the agricultural barriers is part of the long-term operation of the CVP and SWP. Upon completion of installation, DWR will allow the barriers to be operated tidally depending on stage conditions, except for one culvert at each of the three agricultural barriers. These culverts will remain open beyond June 1 if water levels for diversion in the south Delta are not a concern and the mean daily water temperature at Mossdale is less than 71.6 °F (22 °C). See the Temporary Barriers Project Installation and Operation Decision Tree in Appendix 2A, Attachment 3 for details.

2.3.14 Barker Slough Pumping Plant

DWR, at its sole expense, will operate the BSPP to an annual maximum diversion of 125 taf and a maximum daily diversion rate of 175 cfs. The BSPP is a SWP screened diversion that pumps water through the NBA, via an underground pipeline, to Cordelia Forebay outside of Vallejo. The NBA serves Napa County, and the Solano County cities of Fairfield, Vacaville, Vallejo, Benicia, and Travis Air Force Base.

2.3.14.1 Maximum Spring Diversions

DWR operates the BSPP to divert water from the north Delta into the NBA. Longfin Smelt are attracted to the favorable habitat conditions in the north Delta and can potentially inhabit this area during their spawning period in drier years. The operation of the BSPP in combination with other diversions and losses can result in the net negative flow of water from the north Delta into Barker Slough, and these hydrodynamic conditions can lead to the entrainment of larval Longfin Smelt when they are present. Cumulative BSPP diversions for the January 1 to March 31 period, at design capacity, are limited to approximately 26 taf. The incidental take of larval Longfin Smelt at the BSPP is expected to be low due to (1) generally minimal diversion rates during periods when larval Longfin Smelt presence is expected to be greatest (February and March) and (2) BSPP utilizing a positive barrier fish screen making the injury or death of adult and juvenile Longfin Smelt unlikely. However, a small number of larval Longfin Smelt may be entrained during BSPP operations when larvae are present in the area.

Barker Slough Pumping Plant Protections for Larval Delta Smelt

BSPP maximum spring diversions addresses the entrainment risk and transport direction stressor for Delta Smelt. Cumulative BSPP diversions for the March to June period, at design capacity, is 42 taf.

The incidental take of larval Delta Smelt at the BSPP is expected to be low due to (1) generally low diversion rates during periods when larval Delta Smelt presence is expected to be greatest (March and April) and (2) BSPP utilizing a positive barrier fish screen making the injury or death of adult and juvenile Delta Smelt unlikely. However, a small number of larval Delta Smelt may be entrained into Barker Slough during BSPP operations.

Barker Slough Pumping Plant Conservation Measures

Larval Longfin Smelt

DWR proposes to operate the BSPP to protect larval Longfin Smelt from January 1 to March 31 of dry and critical water years. If the water year type changes after January 1 to below normal, above normal, or wet, this action will be no longer in effect. If the water year type changes after January 1 to dry or critical, DWR proposes to operate according to this measure.

From January 1 to March 31 of dry and critical water years, DWR proposes to operate to a maximum seven-day average diversion rate at BSPP less than 100 cfs.

Larval Delta Smelt

DWR proposes to operate the BSPP to protect larval Delta Smelt from March 1 to June 30 of dry and critical water years. If the water year type changes after March 1 to below normal, above normal, or wet, this action will be no longer in effect. If the water year type changes after March 1 to dry or critical, DWR proposes to operate according to this measure.

DWR, at its sole expense, from March 1 to April 30 of dry and critical water years, if catch of larval Delta Smelt (length less than 25 mm) in 20-mm Survey at station 718 exceeds 14 percent of the total catch of larval Delta Smelt across the north Delta (20-mm Survey stations 716, 718, 719, 720, 723, 724, and 726), then DWR proposes to operate to a maximum seven-day average diversion rate at BSPP less than 60 cfs.

DWR, at its sole expense, from May 1 to June 30 of dry and critical water years, if catch of larval Delta Smelt (length less than 25 mm) in 20-mm Survey at station 716 exceeds 5 percent of the total catch of larval Delta Smelt across the north Delta (20-mm Survey stations 716, 718, 719, 720, 723, 724, and 726), then DWR proposes to operate to a maximum seven-day average diversion rate at BSPP less than 100 cfs.

2.3.14.2 Maintenance

Fish screen cleaning, sediment removal, and aquatic weed removal at BSPP is needed year-round to maintain operation of BSPP. Raising and cleaning of the fish screens is necessary to prevent excessive head loss and minimize localized approach velocities.

Sediment removal from the trap and concrete apron in front of the facility is necessary to prevent accumulation and clogging of the screens and facility. Removal of aquatic weeds is necessary to avoid blocking flow and causing water levels to drop in the pump wells behind the screens, triggering automatic shutoffs to protect the pumps from cavitation. Appendix 2A, Attachment 4 provides the operating manual and details for BSPP maintenance, including best management practices to minimize adverse effects on listed species.

2.3.15 Clifton Court Forebay Weed Management

Aquatic weed management is needed year-round to prevent potential damage to SWP equipment through cavitation at the pumps and excessive weight on the fish protection louver array. Excessive weed mats entrained into the fish holding tanks and collection baskets in Skinner Fish Facility reduce the efficiency of fish salvage, affect the ability of staff to conduct fish counts, and smother fish. Dense stands of aquatic weeds additionally provide cover for predators that prey on listed

species within CCF. Algal blooms degrade drinking water quality through production of taste and odor compounds or algal toxins. DWR will apply herbicides and algaecides or will use mechanical harvesters on an as-needed basis to control aquatic weeds and algal blooms in CCF. Appendix 2A, Attachment 5 provides the operations manual and details for CCF weed management, including best management practices to minimize adverse effects on listed species.

2.3.16 Suisun Marsh

The proposed project includes DWR's operation of the Suisun Marsh Facilities (SMSCG, RRDS, MIDS and GYSO) in accordance with the SMPA, which contains provisions for DWR and Reclamation to mitigate the effects on Suisun Marsh channel water salinity from SWP and CVP operations and other upstream diversions. The SMPA requires DWR and Reclamation to meet salinity standards in accordance with D-1641.

The SMSCG are operated on an as-needed basis to meet D-1641 and SMPA water quality standards in Montezuma Slough. The duration of gate operation may range from no use to full use for the entire September through May period. Assuming no significant long-term changes in the operational data, gate operations (outside of additional actions described under Delta Smelt SFHA) will continue as necessary to meet D-1641 and SMPA standards.

RRDS was constructed to provide lower-salinity water to approximately 8,000 acres of managed wetlands. RRDS diversion rates have been controlled to maintain a maximum approach velocity of 0.2 ft/sec at the intake fish screen except for a five-week contiguous period (five-week flood-up window) when the RRDS diversion rate will be controlled to maintain a maximum approach velocity of 0.7 ft/sec for fall flood-up operations. The dates of the five-week flood-up window may change annually due to waterfowl season dates changing each year and corresponding flood-up needs but will occur during the months of September through November. The proposed project includes operation of the RRDS for a five-week flood-up period each year.

2.3.17 Monitoring

DWR and Reclamation would coordinate to undertake monitoring to inform long-term operations associated with the project. Monitoring is necessary to determine and help avoid and minimize the effects of the project, including minimizing anticipated incidental take and informing specific real-time actions.

Because of the ongoing nature of the proposed project, ongoing monitoring efforts to inform operational actions and effects of those actions are currently occurring under existing regulatory authorizations. Potential future changes to monitoring programs associated with operation of the SWP will be addressed in future regulatory processes, such as ITP amendments or separate ITP applications, as appropriate.

Some ongoing programs currently provide incidental take coverage for monitoring associated with the coordinated operation of the CVP and SWP. Active CESA-listed species take permits and consultations cover real-time monitoring surveys, status and trend surveys, and current special studies.

DWR and Reclamation propose aligned FESA and CESA processes to address future changes to monitoring associated with the operation of the CVP and SWP. For FESA purposes, DWR and Reclamation propose a framework programmatic consultation approach to include as part of the

Biological Assessment for the Long-term Operation of the CVP and SWP's Proposed Action. Subsequent changes to existing monitoring programs would be coordinated and included in future consultations of the long-term operation of the CVP and SWP to allow for a more uniform analysis and improved accounting of incidental take coverage associated with the operation of the CVP and SWP. The framework programmatic consultation approach specifies that material changes to monitoring efforts and/or ESA compliance would require subsequent consultation. For CESA purposes, DWR would request changes in incidental take coverage for changes to ongoing monitoring programs via amendment requests to the ITP issued by CDFW for this proposed project, or separate ITP applications, as appropriate.

DWR and Reclamation provide funding to various partners for ongoing monitoring efforts associated with the long-term operation of the CVP and SWP. CESA compliance and incidental take coverage would continue to be provided by the existing authorizations until and if DWR and Reclamation complete a subsequent consultation with USFWS and NMFS on changes to monitoring, and submit an ITP application amendment to amend this proposed project, or submit separate ITP applications, as appropriate. Changes outside the scope and effects in the existing consultations and permits are not authorized to commence until the subsequent consultation and ITP amendment is completed.

The following principles would be incorporated into any future changes to monitoring programs addressed for subsequent changes in take authorizations:

- Ensure monitoring will be beneficial to long-term operation of the CVP and SWP for:
  - Minimizing effects on listed species and habitat (e.g., informing real-time operations, understanding species status)
  - Understanding if various operational objectives are met (e.g., effectiveness and validation monitoring)
  - Measuring if and when the reinitiation trigger associated with amount or extent of incidental take has been met
- Confirm that data collected should meet data quality objectives and open data practices
- Establish multi-agency collaborative approach including management structure for decision-making
- Ensure scientific rigor of new or modified monitoring and achieving objectives of new or modified monitoring
- Develop and test mechanisms for learning and adopting new technologies, while maintaining comparability and continuity to historical information on fish and the environment
- Incorporate a fish, aquatic habitat, and ecosystem monitoring enterprise for the long-term operations of the CVP and SWP that should effectively measure physical conditions, water quality, primary and secondary production; abundance, distribution, and production of ESA- and CESA-listed species (natural and hatchery origin); Delta and tributary fish assemblages; and salvage at the CVP/SWP fish collection facilities
- Establish mechanisms for close coordination with any existing or future adaptive management program
- Provide for robust synthesis of monitoring data to incorporate results and lessons learned

Monitoring of the long-term operations is subject to change over time by implementing these principles to improve monitoring where the best available scientific information indicates such change is appropriate. If and when DWR and Reclamation decide changes to a given monitoring program are necessary, Reclamation will provide the supporting information to USFWS and NMFS to support subsequent Section 7 consultation as outlined in 50 CFR, Section 402.14, and DWR will submit an ITP amendment request or separate ITP applications to CDFW, as appropriate.

2.3.18 Adaptive Management

Adaptive management is a structured, iterative process for decision making when confronted with uncertainty. It emphasizes learning through management where knowledge is incomplete and provides a process for building knowledge through monitoring and science, reducing uncertainty, and improving management over time in a goal-oriented and structured way. Key components of adaptive management are establishing clear and measurable objectives, identifying action goals, and determining management options for best achieving those desired goals.

Decision support tools can be used within the adaptive management framework to identify the uncertainties that are most influential in a decision-making process (management), which in turn can guide the scientific approaches deployed to reduce those uncertainties and allow better informed subsequent decisions. When correctly designed and executed, adaptive management provides a means to develop and evaluate the expected outcomes of proposed management actions, to compare actual outcomes of actions to those expectations, and to make evidence-based adjustments to future actions to improve their effectiveness if warranted. The adaptive management approach can provide a transparent and documented scientific basis for continuing, modifying, or implementing an alternative action.

The Department of Water Resources (DWR), the Department of Fish and Wildlife (CDFW), Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS) (collectively, "the Implementing Entities") intend to utilize adaptive management to inform the long-term operations of the ~~State Water Project (~~SWP~~)~~ and ~~the Central Valley Project (~~CVP~~)~~ and related activities described herein. The Implementing Entities will approach adaptive management in an open, participatory framework. The Implementing Entities will establish the Adaptive Management Steering Committee to oversee individual Adaptive Management Teams responsible for implementing each Adaptive Management Action, utilizing decision support tools such as structured decision making.

Working through the collaborative process outlined in this document, the Implementing Entities commit to reach consensus within the AMSC to the maximum extent possible, while still retaining individual agency discretion to make decisions (as appropriate). To that end, the Implementing Entities seek to use the potential flexibility provided by an adaptive management approach in a way that balances gaining knowledge to improve future management decisions while taking actions in the face of uncertainty to achieve the best outcomes possible for listed species.

The Adaptive Management Program is described in Appendix 2B. Appendix 2B also includes a list of actions and programs in the Proposed Action (listed below), and additional details regarding the timeframe of evaluation of each action and the Adaptive Management Team responsible for implementing them:

- Winter-run Chinook Salmon OMR Management
- Spring-run Chinook Salmon JPE and Life Cycle Model
- Larval and Juvenile Delta Smelt OMR Management
- Larval and Juvenile Longfin Smelt OMR Management
- Summer-Fall Habitat Action for Delta Smelt
- Tidal Habitat Restoration Effectiveness
- Tributary Habitat Restoration Effectiveness*
- Winter-Run Chinook Salmon Early Life Stage Studies*
- Shasta Spring Pulse Flow Studies*
- Delta Route Selection and Survival
- Delta Smelt Summer and Fall Habitat
- Delta Smelt Supplementation
- Longfin Smelt Science Plan Actions
- Steelhead JPE and OMR Management*
- Alternative Salmonid Loss Estimation Pilot Study
- Georgiana Slough Migratory Barrier Effectiveness
- Spring Outflow

Studies and adaptive management noted with an asterisk are elements of the adaptive management plan but are not DWR's responsibility. DWR has partial or full responsibility for items that are not noted with an asterisk.

2.3.19 Special Studies

Special studies address areas of scientific uncertainty on the reasonable balance among competing demands for water, including the requirements of fish and wildlife, M&I, agricultural, and power contractors. While special studies do not avoid, minimize, or mitigate adverse effects on CESA-listed species, over time they may inform the effectiveness of measures taken to avoid, minimize, or mitigate incidental take. Because these special studies are being implemented to inform the effectiveness of measures to minimize or mitigate incidental take via the AMP described in Section 2.3.18, "Adaptive Management," and Appendix 2B, DWR is not seeking take coverage for these studies.

Special studies in the proposed project are described below.

2.3.19.1 Spring-Run Chinook Salmon Juvenile Production Estimate and Life Cycle Model

Spring-Run Chinook Salmon Juvenile Production Estimate

DWR and Reclamation will support continued development of a Spring-Run Chinook Salmon Juvenile Production Estimate (SR-JPE) framework for CVP and SWP tributaries and the Delta, and propose a SR-JPE Plan for implementation, including an approach for modeling a SR-JPE and the monitoring program to support that approach. The SR-JPE Plan will incorporate independent review and will be the basis for consideration of updated entrainment minimization measures described in Section 2.3.3.3, "Spring-run Chinook Salmon and Surrogate Thresholds," including updating hatchery surrogate measures. The process to develop the framework and SR-JPE Plan will continue the ongoing effort to develop a SR-JPE initiated in 2020 and outlined in the SR-JPE Science Plan (California Department of Water Resources et al. 2020), the SR-JPE Interim Monitoring Plan (Allison et al. 2021), the SR-JPE Run Identification Research and Initial Monitoring Plan (Boro et al. 2023), the SR-JPE Data Management Strategy (Harvey et al. 2022), and the SR-JPE Decision Charter (Horndeski 2022). These plans describe the decision processes, research, monitoring, and data management infrastructure that will be needed to meet the goal of developing a SR-JPE ready for implementation in 2026, including guidance by an interagency team (SR-JPE Core Team) using structured decision-making (SDM) principles, rapid and coordinated reporting of new data onto a publicly accessible repository, routine and rapid genetic testing, and additions to existing and/or new monitoring programs at Delta entry and in representative streams supporting spring-run Chinook Salmon: Clear Creek, Battle Creek, Mill Creek, Deer Creek, Butte Creek, Yuba River, and Feather River (see DWR's Spring Run Chinook Salmon Juvenile Production Estimate Science Plan[7]).

Spring-Run Chinook Salmon Life Cycle Model

DWR and Reclamation will support the development of a Spring-Run Chinook Salmon Life Cycle Model (SR-LCM) for the purpose of informing management actions to improve Central Valley spring-run Chinook Salmon population status. DWR and Reclamation will assemble an interagency management team (SR-LCM Management Team) including representatives from Reclamation, DWR, CDFW, NMFS, and USFWS, to define the specific management issues and objectives to be addressed by the SR-LCM. Because of the close link between SR-LCM and SR-JPE development through a shared use of historical and newly generated data, the SR-JPE Core Team will be responsible for guiding the development of the SR-LCM to address the management objectives, and for determining whether the required modeling can be accomplished through an update of one or more existing Central Valley Chinook Salmon modeling efforts, such as the SR-JPE, the NMFS spring-run Chinook Salmon life cycle model, and the CVPIA Science Integration Team salmon life cycle models. The SR-JPE Core Team will use SDM principles when appropriate. The SR-JPE Core Team will develop and submit a SR-LCM Modeling Plan and timeline to the SR-LCM Management Team for approval, and guide implementation of the plan. To facilitate open communication between the lead life cycle modeler and agency staff, a Lifecycle Modeling Subteam will be established. Throughout the process to develop the SR-LCM and implement the SR-LCM Modeling Plan, the lead life cycle modeler will collaborate with the Lifecycle Modeling Subteam through regular meetings to solicit feedback and integrate that feedback into model development iteratively, in a manner similar to the SR-JPE Modeling Subteam described above.

[7] Available at: Endangered Species Protection (ca.gov)

Required actions in 2025:

1. Under the guidance of the SR-JPE Core Team, the SR-JPE Modeling Subteam will develop a suite of initial SR-JPE model based on available spring-run Chinook Salmon data and provide the models to the SR-JPE Core Team for review. The SR-JPE Core Team will recommend a SR-JPE framework, composed of the selected SR-JPE models and the monitoring program required to provide data to calculate an annual SR-JPE.
2. DWR and Reclamation will assemble the SR-LCM Management Team and begin coordination with the SR-JPE Core Team on the development of the SR-LCM.

Required actions in 2026:

1. In coordination with the SR-JPE Core Team, the Adaptive Management Steering Committee will charter and convene an independent peer review panel to provide feedback on the SR-JPE Core Team's recommended SR-JPE framework.
2. Following the independent peer review, DWR and Reclamation will prepare a draft SR-JPE Plan in collaboration with CDFW, NMFS, and USFWS that describes the approach to calculating a SR-JPE and the monitoring and special studies needed to collect the data to calculate a SR- JPE annually. The draft SR-JPE Plan will be guided by the SR-JPE Core Team SDM process and SR-JPE framework recommendation, and by the independent peer review panel. DWR and Reclamation will submit the draft SR-JPE Plan to the SR-JPE Core Team for review and work collaboratively to incorporate SR-JPE Core Team comments into the final SR-JPE Plan.
3. The SR-JPE Core Team will review the spring-run Chinook Salmon hatchery surrogate OMR minimization measure described in Section 2.3.3.3, "Spring-run Chinook Salmon and Surrogate Thresholds."
4. DWR, CDFW, Reclamation, and NMFS will meet to contemplate development of a new or modified spring-run Chinook Salmon hatchery surrogate OMR minimization measure described in Section 2.3.3.3, "Spring-run Chinook Salmon and Surrogate Thresholds," informed by the independent peer review panel input on the SR-JPE framework, historical spring-run Chinook Salmon data, new data obtained from the monitoring and special studies needed to collect the data to calculate the SR-JPE, SR-JPE Core Team review of the spring-run Chinook Salmon hatchery surrogate OMR minimization measure, and other relevant information (for example Georgiana Slough monitoring data). Any new minimization measure approach for spring-run Chinook Salmon will:
    a. Take into account the limitations of the initial SR-JPE approach to calculate the SR-JPE
    b. Be an interim approach to be refined as the SR-JPE approach evolves and the SR-LCM is completed
    c. Anticipate future iterations and refinements of SR-JPE approach
    d. Rely primarily on monitoring data rather than salvage data
5. DWR and Reclamation will submit the final SR-JPE Plan to CDFW and NMFS for approval no later than six months after the independent peer review and spring-run Chinook Salmon hatchery surrogate OMR minimization measure review are completed, whichever is later.

6. After the final SR-JPE Plan is approved by CDFW and NMFS, DWR and Reclamation will convene the SR-JPE Core Team and subteams to provide an annual SR-JPE estimate, implement the final SR-JPE Plan (including monitoring), and ensure all data obtained through long-term monitoring programs is stored in a publicly accessible repository.
7. The SR-JPE Core Team will develop and submit a draft SR-LCM Modeling Plan and timeline to the SR-LCM Management Team for approval and guide implementation of the final SR-LCM Modeling Plan upon approval.
8. DWR and Reclamation will assemble the Lifecycle Modeling Subteam for coordination between the lead life cycle modeler and the SR-JPE Core Team.

Required actions in 2027:

1. If approved by CDFW and NMFS, DWR and Reclamation will implement the new or modified spring-run Chinook Salmon OMR minimization measure based on the initial SR-JPE approach to calculate the SR-JPE.
2. DWR and Reclamation will implement changes to monitoring if recommended through the SR-JPE SDM process and approved by CDFW and NMFS, through appropriate take authorization for monitoring activities and contingent on ~~stakeholder~~ interested parties' participation from non-CVP or SWP tributaries.
3. The SR-JPE Modeling Subteam will continue to develop and refine the SR-JPE model by integrating new data as they become available and adjusting the modeling approach in collaboration with the SR-JPE Core Team and in response to SDM processes conducted by the SR-JPE Core Team.
4. The Lifecycle Modeling Subteam will convene regular meetings to implement the final SR-LCM Modeling Plan and to solicit and incorporate feedback on model development.

Required actions in 2028:

1. Under the guidance of SR-LCM Management Team and SR-JPE Core Team, the Lifecycle Modeling Subteam will recommend an initial SR-LCM.
2. In coordination with the SR-JPE Core Team and the SR-LCM Management Team, the Adaptive Management Steering Committee will consider chartering and convening an independent peer review panel to provide feedback on the SR-JPE model and the initial SR-LCM.

Required actions in 2029 and 2030:

1. Following the independent peer review, the SR-JPE Core Team and the Lifecycle Modeling Subteam will review independent peer review panel input (if convened) and the SR-JPE Core Team will use SDM to evaluate and implement changes to the SR-JPE model and the initial SR-LCM.

2.3.19.2 Habitat Restoration Effectiveness

DWR and Reclamation will continue to use the existing Fish Restoration Program for effectiveness monitoring of habitat restoration projects. Additional focused research to support an understanding of food web support function and/or habitat effectiveness will be considered annually as part of the Interagency Ecological Program's work planning process.

DWR and Reclamation will use an adaptive management program to evaluate and identify actions that may improve the effectiveness of its restoration projects. Adaptive management actions will be focused on a comprehensive understanding of how all restoration projects function across the landscape and in consideration of other conservation measures (e.g., Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project) that may enhance food web production and rearing habitat for Delta Smelt.

2.3.19.3 Delta Route Selection and Survival

These studies involve an acoustic receiver network and associated real-time and retrospective modeling of the data obtained from the receiver network. The objectives are to provide real-time estimates of reach-specific survival and route entrainment for juvenile salmonids in the Sacramento River and Delta.

2.3.19.4 Delta Smelt Summer and Fall Habitat

DWR and Reclamation will consider food subsidy measures to augment the SFHA. Food subsidy actions are hypothesized to increase localized prey availability for Delta Smelt in the north Delta and Suisun Marsh, resulting in opportunities for higher growth and survival of juvenile and sub-adult life stages. DWR and Reclamation will decide which of the following food subsidy actions are most appropriate given hydrologic conditions (i.e., water year type), logistical constraints, and information needs: (1) one of several variations of the North Delta Food Subsidy Action; (2) one of several variations of managed wetland reoperation in Suisun Marsh; and/or (3) the Sacramento Deep Water Ship Channel Food Subsidy Action. For any year when one or more of the food subsidy actions is implemented, an action plan, science and monitoring plan, and monitoring report will be produced to evaluate action effectiveness. Monitoring plans and reports will also be produced in years in which actions are not implemented to serve as contrasts. Food subsidy action plans, monitoring plans, and reports will be developed in collaboration with, and reviewed by the DCG. Food subsidy action research results will be included in seasonal reporting and adaptive management reviews of the SFHA to evaluate the science and monitoring, efficacy of actions, hypothetical alternative strategies and/or actions, and potential inclusion of food subsidy actions as potential permanent action elements of the SFHA, or if appropriate, termination of actions deemed ineffective.

2.3.19.5 Longfin Smelt Science Plan

DWR, in coordination with Reclamation, will implement science activities identified in the 2020 ITP Longfin Smelt Science Plan (LFSSP)[8]; including the development of a mathematical life cycle model. The life cycle model will be used as a quantitative tool to characterize the effects of abiotic and biotic factors on Longfin Smelt populations. Additional Longfin Smelt science and monitoring informed by the life cycle modeling efforts will be implemented, as needed through the adaptive management process (Appendix 2B).

[8] Available at: Endangered Species Protection (ca.gov)

Longfin Smelt Science and Monitoring Initiatives

DWR and CDFW, in collaboration with the State Water Contractors and USFWS, developed the LFSSP to meet a requirement in the 2020 ITP, and the LFSSP was finalized on December 8, 2020. DWR, in coordination with Reclamation, will support updating and implementing the LFSSP through a multi-agency process. The purpose of the LFSSP is to provide a framework for Longfin Smelt science investments through 2030, including seven key priority areas. Longfin Smelt science and monitoring informed by the life cycle modeling efforts will continue beyond 2030, as appropriate.

Science priority areas in the LFSSP:

1. Life cycle modeling
2. Factors affecting abundance, growth, and survival
3. Improved distribution monitoring
4. Improved larval entrainment monitoring
5. Longfin Smelt culture
6. Fish migration and movements
7. Spawning and rearing habitats for Longfin Smelt

The Longfin Smelt Technical Team is charged with implementation and refinement of the science conducted under the LFSSP. Additionally, the Longfin Smelt life cycle model, prioritized in the LFSSP and currently under development, will highlight critical gaps in our current understanding of Longfin Smelt ecology and will guide implementation of core elements of the LFSSP, particularly with respect to new and expanded monitoring.

2.3.19.6 Alternative Loss Estimation Pilot Study

DWR, in coordination with Reclamation, has completed a draft updated Alternative Loss Equation (ALE-22) software tool for estimating losses at the SWP and CVP export facilities to quantify incidental take of winter-run and spring-run Chinook Salmon, and California Central Valley steelhead. DWR, in coordination with Reclamation, proposes to further refine the parameters of this tool by developing an ALPS-IP to implement this tool in parallel with current loss estimation methods. The goal of this pilot study is to provide a more accurate estimate of loss, and loss parameters, at the SWP and CVP export facilities while understanding the utility of the new alternative method, relative to the existing method. The ALPS-IP will be completed in coordination with the Skinner Fish Facility and Salvage Release sites improvements activities and if practicable will be utilized to further enhance these activities.

DWR and Reclamation propose to collaborate on the following actions:

1. ALPS-IP Development
    - Within six months of the latest effective date of the ROD or ITP, whichever is later, DWR in collaboration with Reclamation shall conduct a knowledge transfer and methods workshop for the ALE-22 tool. Participants may include representatives from NMFS, USFWS, CDFW, DWR, State Water Contractor and Central Valley Project Contractors, and Reclamation.

- Within six months of the completed ALE-22 workshop DWR, in collaboration with Reclamation, shall convene the ALE Technical Team (ALE-TT), a subteam of the Central Valley Fish Facilities Review Team (CVFFRT), and DWR shall submit a draft ALPS-IP to the ALE-TT for review and comment.
- The draft ALPS-IP shall include:
  - SDM process outline
  - Interim, draft, and final reporting protocols, and meeting schedules
  - Pilot study design
  - Procedures and timelines (e.g., start and stop dates)
  - Target species (e.g., winter-run and spring-run Chinook Salmon, and California Central Valley steelhead)
  - Assessment of multiple parameters to account for losses including, but not limited to: salvage facility outages during louver cleaning or mechanical failure; post-release survival on salvaged fish
- Within four months of receiving ALE-TT review comments DWR would submit the final draft ALPS-IP to the CVFFRT, SaMT, and the agency sub-directors for comment/approval
- Within one month of receiving CVFFRT, SaMT review, and subsequent agency sub-director comments/approval, DWR would finalize the ALPS-IP.

2. Pilot Study Implementation and Prioritization
   - DWR and Reclamation shall conduct the ALPS-IP pilot study as defined.
   - DWR and Reclamation would utilize the ALE-TT and the defined SDM procedures to complete a prioritization of the pilot study recommendations for further implementation.
     - The ALE-TT may utilize an independent science panel review to further enhance the SDM prioritization process.
   - DWR and Reclamation shall complete the Pilot Study and prioritized recommendations within 1.5 years of completing the ALPS-IP and submit final recommendations to the agency sub-directors for approval.
3. Implementation Prioritization recommendations
   - DWR and Reclamation shall proceed with the recommendations for further implementation

The ALPS-IP, Pilot Study, the prioritization of the recommendations for further implementation, and implementation shall be completed within 7 years after the latest effective date of the ROD or ITP.

2.3.20 Drought

Starting each October, Reclamation and DWR, through the Drought Relief Year (DRY) Team, will meet at least monthly to determine whether it would be appropriate to pursue actions to respond to current or anticipated drought and dry year conditions. At each meeting, DWR and Reclamation will review the actions in the Drought Toolkit, Appendix 2A, Attachment 6, and determine if it would be appropriate to pursue any of them, and evaluate the effectiveness of those actions. The Drought Toolkit will list the minimum decisions required each month and DWR and Reclamation expect a

more focused review of the Drought Toolkit actions in times when resources to meet required operations and goals are limited. These limited resources may include, but are not limited to hydrology, current and projected reservoir storages, facility limitations and fish conditions. These decisions will be documented monthly or more often if necessary in the WOMT notes.

Reclamation and DWR, through the DRY Team, may update the Drought Toolkit. DWR and Reclamation, through the DRY Team, will evaluate drought actions taken to reduce drought impacts related to CVP and SWP operations. This evaluation will provide additional information on the effectiveness of drought response so as to support updates to the Drought Toolkit. This evaluation will be included in an annual Drought Report.

2.3.21 Additional Actions Retained from 2020 ITP

The actions described below originated before or as part of the 2020 ITP for the Long-term Operation of the State Water Project Facilities in the Sacramento San Joaquin Delta (California Department of Fish and Wildlife 2020) and are continuing as part of this Proposed Project. Because these actions were included in the 2020 ITP, they are part of Baseline Conditions and DWR is not seeking take coverage for these actions.

2.3.21.1 Sutter and Steamboat Slough Guidance Structures

DWR evaluated the potential benefits of salmonid guidance structures at Sutter and Steamboat Sloughs. DWR is currently implementing regional survival studies and evaluating salmon survival, behavior, and developing tools to assess further actions to improve salmon survival (California Department of Water Resources 2023).

2.3.21.2 Salmon Rearing Habitat in the Bay-Delta

To inform salmonid impact assessments and restoration activities, DWR will fund research activities to investigate juvenile salmonid habitat use in the Delta, Cache Slough, and Suisun Marsh. This work builds upon ongoing work funded by the Delta Conservancy (Identifying Suitable Rearing Habitat for Chinook Salmon in the Sacramento-San Joaquin Delta) and DWR (Juvenile salmon distribution, abundance, and growth in restored and relict Delta marsh habitats). Data collected through this research will also inform ongoing winter-run Chinook Salmon lifecycle modeling and the development of a new spring-run Chinook Salmon lifecycle model.

2.3.21.3 Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project

DWR is currently constructing an operable fish passage structure at the Fremont Weir in the Yolo Bypass as part of implementing the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project (Salmonid Habitat and Fish Passage Project). The objective of the Salmonid Habitat and Fish Passage Project is to enhance floodplain rearing habitat and fish passage in the Yolo Bypass by implementing the Project as described in Alternative 1 of the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Final EIR/EIS (California Department of Water Resources and U.S. Bureau of Reclamation 2019b). This project will benefit adult and juvenile migrating winter-run and spring-run Chinook Salmon, Central Valley steelhead, the Southern DPS of North American Green Sturgeon, and White Sturgeon.

The first objective of the Salmonid Habitat and Fish Passage Project is to increase the availability of floodplain rearing habitat for juvenile winter-run and spring-run Chinook Salmon and Central Valley steelhead. This action can also improve conditions for Sacramento Splittail and Central Valley fall-run Chinook Salmon. Specific biological goals include:

- Improve access to seasonal habitat through volitional entry
- Increase access to and acreage of seasonal floodplain fisheries rearing habitat
- Reduce stranding and presence of migration barriers
- Increase aquatic primary and secondary biotic production to provide food through an ecosystem approach

The second objective of the Salmonid Habitat and Fish Passage Project is to reduce migratory delays and loss of fish at Fremont Weir and other structures in the Yolo Bypass. Specific biological goals include:

- Improve connectivity within the Yolo Bypass for passage of salmonids and green sturgeon
- Improve connectivity between the Sacramento River and the Yolo Bypass to provide safe and timely passage for:
- Adult winter-run Chinook Salmon between mid-November and May when water surface elevations in the Sacramento River are amenable to fish passage
- Adult spring-run Chinook Salmon between January and May when elevations in the Sacramento River are amenable to fish passage
- Adult California Central Valley steelhead in the event their presence overlaps with the defined seasonal window for other target species when elevations in the Sacramento River are amenable to fish passage
- Adult Southern DPS Green Sturgeon between February and May when elevations in the Sacramento River are amenable to fish passage.

DWR will implement the Salmonid Habitat and Fish Passage Project in accordance with its Adaptive Management Program (California Department of Water Resources 2020).

2.3.22 Governance

2.3.22.1 CVP/SWP Governance

CVP/SWP Governance identifies ongoing engagement by participating state and federal agencies (collectively the Agencies), interested parties, and/or the public following issuance of the new ITP and completion of the BiOps and ROD. Governance describes the systemwide organization of technical groups, group membership, activities that are subject to governance, and decision-making approaches and protocols. Although CVP/SWP Governance applies to the coordinated operation of the CVP and SWP, and associated effects, DWR will participate fully in the CVP/SWP Governance process, but DWR is the party solely responsible for SWP effects on CESA-listed species and will make decisions regarding SWP operations and facilities consistent with its authorities and the decision-making processes identified in this document. Accordingly, DWR is only seeking incidental take authorization for CESA-listed species for SWP operations-related effects. In specific situations, the CDFW Director may require DWR to implement CDFW's operational decision and DWR will implement the decision required by CDFW.

The purposes of CVP/SWP Governance are to:

- Identify the roles and responsibilities of the agencies that are part of real-time operations
- Establish that the agencies will work together in good faith
- Identify the governance principles agreed to by the participating agencies
- Identify operations that are subject to Governance
- Identify the implementation teams that are part of Governance, and processes for technical collaboration and elevating issues for resolution
- Incorporate learning and adopt new technologies from monitoring, adaptive management and ongoing science
- Describe relationships between technical and policy groups
- Describe reporting and outreach

The agencies are committed to communicate each organization's respective interests and recognize the intent to work together in a good-faith effort to resolve issues through the groups described in the following governance subsections ~~of this ITP Application~~ . Every member is committed to identifying potential issues and communicating these issues to the relevant technical or policy team as soon as possible. Representatives who participate on technical and policy teams are clear about their ability to represent agency decisions. Representatives who participate on technical and policy teams are empowered to represent their agency and make decisions appropriate for that level. Each representative is representing the science, policy, and management based on the best of their ability and current knowledge. Representatives will be aware and clear about their role with other members and come with the understanding of their authority as it relates to their agency. Representatives will either be able to make decisions on other parts of the system or have an avenue for doing that quickly.

CVP/SWP Governance is framed around the following principles:

- Collaboration—The leading principle of CVP/SWP Governance is collaborative, science-based decision making. CVP/SWP Governance is structured to seek consensus across scientific, technical and policy levels, with elevation and decision-making processes in place when consensus cannot be reached.
- Effectiveness—It is workable and efficient. Effectiveness considers what information is available and when. Effective CVP/SWP Governance recognizes that there is more uncertainty early in the year and that uncertainty may change as the year progresses.
- Accountability—Operational, regulatory, proactive, and addresses long-term planning.
- Inclusiveness—Collaborative and cooperative. The elevation and decision-making structure maintains accountability at all levels.
- Transparency—The processes are not opaque. They are open for others to see and understand through implementation of a communication plan.
- Communication—There is awareness and clarity about roles. If a participants identify a potential issue, they will communicate it.

SWP Proportional Share

As described above, in specific situations, the CDFW Director may require DWR to implement CDFW's operational decision. If, following a decision-making process identified under this Governance structure (e.g., after a WOMT assessment is elevated to the Directors), there is a difference between what is required by CDFW compared to the operational decision implemented by Reclamation, DWR shall meet its proportional share of the operational criteria determined by the CDFW Director. For operational criteria related to OMR flows and export restrictions, proportional share shall be determined as follows:

1. DWR is legally bound, both statutorily and through agreements with the Bureau of Reclamation, not to utilize State facilities (including the CCF, Banks Pumping Plant, the California Aqueduct, and the SWP share of San Luis Reservoir) or allow third parties (including the CVP) to use State facilities in a manner that would result in a violation of law.
2. If prohibiting the use of state facilities for CVP purposes will not result in conditions that meet the operational criteria determined by CDFW, DWR shall provide CDFW with a written estimate of the total allowed exports at both the SWP and CVP facilities that would be required to meet the operational criteria at issue.

The SWP shares of allowable exports are defined based on the SWP share of exports during excess and balanced conditions described in the 2018 COA Addendum[9] or as amended.

DWR shall not be required to reduce exports below the SWP COA share of combined SWP and CVP exports of 1,500 cfs, the minimum required to meet health and safety standards. Based on the 2018 COA addendum the DWR minimum export is 600 cfs.

2.3.22.2 Organizational Structure and Description of Collaborative Teams by Division

CVP/SWP Governance is structured such that a five-agency Directors Group oversees the ongoing authorities of each respective agency and serves as the final decision-making body for operational matters within the parameters established in this proposed project and regulatory authorizations. Actions or decisions necessitating reinitiation of consultation or new or amended authorization under CESA would be handled through standard regulatory processes and are not subject to this Governance structure. The Directors Group directly interfaces with two management and policy level groups (Shasta Operations Team [SHOT] and WOMT), whose federal and state agency representatives discuss the actions described in the proposed project when implementation may have biological effects, system conditions or water supply impacts, or tradeoffs. These policy groups work with numerous technical groups that coordinate, discuss, and provide input on seasonal and real-time operations for specific regions or watersheds. The Adaptive Management Steering Committee (AMSC) will work in parallel with the SHOT and WOMT to evaluate identified Adaptive Management Actions, and potentially recommend changes to the Proposed Action to the Directors Group. Figure 2-3 illustrates the CVP/SWP governance structure for water operations. Appendix 2B describes the more specific governance structure for the Adaptive Management Program.

[9] Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project. Signed December 13, 2018.

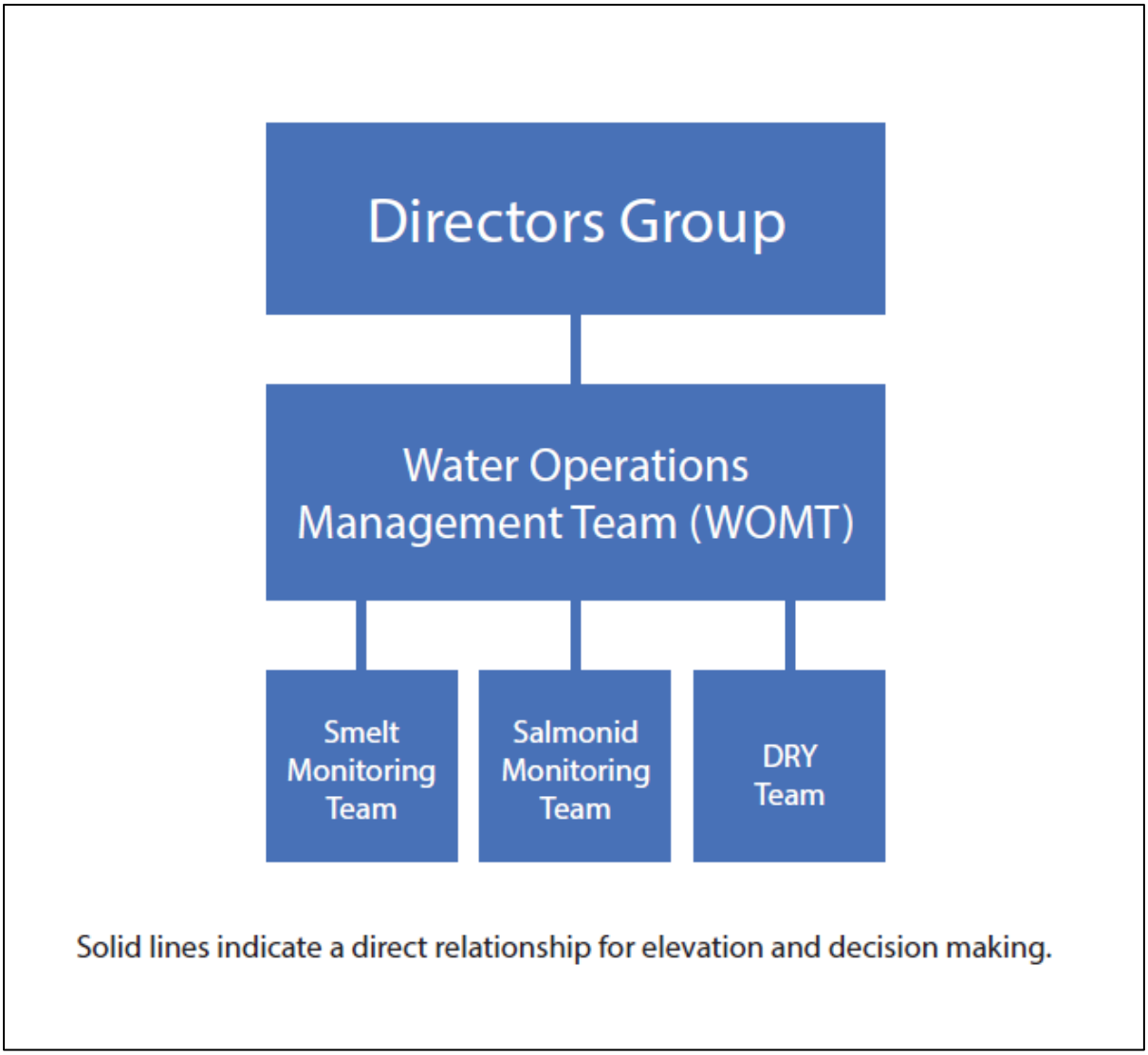


Figure 2-3. Governance Structure for SWP Water Operations

2.3.22.3 Chartering Teams

Teams and groups involved in planning and providing input regarding water operations are described below for each division of the CVP and SWP. Team membership, roles, and processes will be described in team charters. Some teams may already have charters in place which will continue to be followed until, and if replaced in the future. These charters may be supplemented by guidance documents which further elaborate roles, responsibilities, and processes for these teams. These guidance documents will be updated as needed by mutual agreement.

As described below, external participants are also included in many of the collaborative teams to provide technical expertise and allow sharing and communication of operational decisions. The expectations and group norms for the external participants will be described in team charters.

2.3.22.4 Delta

For Delta water operations there are three main agency coordination forums that will meet regularly to discuss seasonal and real-time operations. These include WOMT, the SMT, and the SaMT. WOMT is a policy-level group that discusses the operations actions in the Delta (CWP and CVP facilities and operations), American River Division of the CVP, and Stanislaus/East Side Division of the CVP. The SMT is a technical group that discusses Delta operations and smelt protections. The SaMT is a technical group that discusses Delta operations and salmon and steelhead protections. WOMT will coordinate regularly with SHOT and other work groups as appropriate. Delta governance will use a collaborative approach to planning and decision-making.

Water Operations Management Team

WOMT will coordinate on overall water operations to oversee the implementation of various real-time provisions for the Delta and the tributaries. The purpose of WOMT is to discuss and resolve operational questions and technical issues, as requested or elevated from Delta and tributary technical teams, and to elevate unresolved operational issues to the Directors Group. The team will develop a charter to describe membership and process. The WOMT will coordinate with the SHOT as needed on operational issues and decisions that have implications for both of their respective purviews, including but not limited to drought toolkit implementation and VA asset management.

WOMT will meet weekly during the OMR flow management season (October–June), and otherwise as needed. Any agency can request a WOMT meeting outside of the OMR season for discussion or elevation items. For OMR management, Reclamation and DWR will provide operational outlooks and assessments on a weekly basis to WOMT, the SMT, and the SaMT. WOMT will be provided the opportunity to review and discuss any applicable drought and dry year actions from the drought toolkit or other relevant drought planning documents. For all other assessments or elevation issues, supporting materials will be provided to WOMT by designated representatives of the applicable technical teams.

Smelt and Salmonid Monitoring Teams

The SMT and SaMT include participants from Reclamation, USFWS, NMFS, DWR, CDFW, and State Water Board. The SMT and SaMT review hydrologic, operational, fishery, and water quality data, and provide opportunities for engagement and discussion among biologist and operators on relevant information and issues associated with the proposed project and risk assessments.

Agency team leads: (1) notify their agency's WOMT representative(s) if a Reclamation Proposed Action or ITP identified trigger/threshold is or will be met; (2) provide input on the Reclamation Proposed Action assessment; and (3) discuss and document differing perspectives (i.e. non-consensus) on the relevant assessments.

In addition, there are also two additional groups that discuss operations that include other interested parties:

Delta Monitoring Workgroup

~~The Delta Monitoring Workgroup (DMW) will include technical representatives from federal and state agencies and stakeholders who can provide information to DWR and Reclamation on species abundance, species distribution, life stage transitions, and relevant physical parameters. The federal and state participants will be the agency leads and/or alternates from the SaMT and SMT. Similar to the federal and state agencies, the SWP and CVP contractors shall identify a lead and alternate participant, who are knowledgeable and have expertise in water operations, monitoring, and fish biology. The main focus of the DMW meetings is to: (1) review hydrologic, operational, fishery, and water quality data; (2) provide opportunities for engagement and discussion among biologists and operators on relevant information and issues; and (3) review the Reclamation Proposed Action Assessment and ITP Risk Assessment. The results of the DMW discussions will be captured in meeting notes for consideration by DWR and Reclamation.~~

DWR and Reclamation will convene the Delta Monitoring Workgroup if a real-time assessment in triggered. Interested parties may provide information and supporting documentation for DWR and Reclamation to share with WOMT. If WOMT does not reach consensus on an operational outcome, interested party supporting documentation will be provided to the Directors for consideration of their final decision. DWR and Reclamation will revise the existing Delta Monitoring Workgroup charter within six months of the permit issuance.

Delta Coordination Group

The DCG is comprised of two representatives each from Reclamation, NMFS, USFWS, DWR, and CDFW, and one representative each from the CVP water contractors and SWP water contractors. The DCG may prepare an assessment to propose an alternative gate operation to the SMSCG action and will develop an annual monitoring plan for the action. The DCG will participate in the development of food subsidy action plans, monitoring plans, and reports.

2.3.22.5 LTO Adaptive Management Program

Reclamation, DWR, USFWS, NMFS, and CDFW, through the Adaptive Management Steering Committee (AMSC), are responsible for support, coordination, and implementation of the LTO Adaptive Management Program. The LTO Adaptive Management Program will address important uncertainties and trade-offs (policy and ecological) associated with adaptively managing actions identified in Attachment A to the LTO Adaptive Management Plan. There are two primary forums for discussion and action evaluation within the LTO Adaptive Management Program: AMSC and Adaptive Management Teams (AMTs). Below is a brief summary of each forum. The roles, responsibilities and scope of the AMSC and AMTs are described in detail in the LTO Adaptive Management Plan (Appendix 2B).

Adaptive Management Steering Committee

The purpose of the AMSC is to provide direction and guidance for the LTO Adaptive Management Program, coordinate each agencies participation, and ensure effective and efficient implementation of all Adaptive Management Actions. AMSC decisions will be informed by AMTs dedicated to each individual Adaptive Management Actions identified in Appendix 2A to the LTO Adaptive Management Plan. Reclamation, DWR, USFWS, NMFS and CDFW will hire a team of floating independent facilitators to help each AMT identify management objectives and goals, identify and synthesize information areas related to those objectives, determine critical uncertainties affecting

management decisions, define additional information needs to reduce critical uncertainties, and integrate products of the various AMTs in a way that clarifies what decisions need to be made, what trade-offs may need to be considered, and how confidently the outcomes of those decisions can be predicted.

Adaptive Management Teams

AMTs will be dedicated to each Adaptive Management Action identified in Appendix 2A. AMTs are charged with identifying uncertainty, building knowledge, and implementing each Adaptive Management Action. The purpose of individual AMTs is to convene scientific technical staff from Reclamation, DWR, USFWS, NMFS, CDFW, and interested parties in working groups to plan, implement, and assess each of the actions identified in Attachment A of Appendix 2B.

2.3.22.6 Collaborative Decision Making

This section describes the representatives and the process for elevation, decision-making, and communication. More information on the types of decisions and process for each division can be found in the corresponding section of the long-term operations proposed action.

Directors

Directors from Reclamation, DWR, USFWS, NMFS, and CDFW will meet as requested by WOMT or SHOT when consensus cannot be reached on operations for the above-referenced measures. The team that is the lead for the elevation issue will notify the other teams prior to elevating to the directors to ensure full transparency.

Director Decision-Making for the Delta

The Regional Director of Reclamation and/or DWR (proposing agency or agencies), as appropriate, will confer with the fish agency Directors/Regional Administrator to determine if there is an alternative action that will be mutually agreeable. If consensus is reached, the proposing agencies will implement the alternative action. If the Directors do not reach a resolution on operations, the proposing agencies will meet and confer to prioritize alignment between the SWP and CVP operations, in consideration of operational and regulatory constraints affecting either project, will identify a recommended action within two days, providing a written explanation of the nature of the dispute. The proposing agencies will respond in writing within two days after receiving the explanation for the disputed action and before taking an action. Any director may request a follow-up Directors' meeting if necessary.

With respect to SWP operations only, within two days after receiving the recommended action from the proposing agencies, the CDFW Director may disagree with the recommended action and require DWR to implement an operational decision provided by CDFW in writing. DWR will implement CDFW's operational decision.

Once a decision has been resolved following any of the procedures described above, the Directors will designate a representative or representatives to communicate the decision to relevant parties, including operators, technical team representatives, and/or other interested parties.

2.3.22.7 Water Operations Management Team

Each agency is responsible for being informed of conditions and communicating with their respective representatives on other teams. If issues that are elevated to WOMT are resolved by WOMT, an agency representative will be designated by WOMT to communicate the decision via email to relevant technical team representatives. If the WOMT cannot reach consensus on an operational issue, the issue will be elevated to the Directors through the subdirectors. Similarly, if the SHOT or WOMT have an operational disagreement, the issue will be elevated to the directors through the subdirectors. The elevation process will be managed collaboratively by the WOMT.

2.3.22.8 Smelt and Salmonid Monitoring Teams

Each participating agency is responsible for being informed of conditions and communicating with their respective representatives on other teams. Agency team leads: (1) notify their agency's WOMT representative(s) if a Reclamation Proposed Action or ITP identified trigger/threshold is or will be met; (2) provide input on the Reclamation Proposed Action assessment and advice on the ITP risk assessment: and (3) discuss and document differing perspectives (i.e., non-consensus) on the relevant assessments. If there is an operational issue that the team cannot resolve, the agency representatives will compose an email to WOMT, summarizing the elevation topic and any supporting information and recommendations. Each of the agency representatives are individually responsible for communicating the issues and any background information to their WOMT representative. The decision-making process will follow the procedure described in Section 2.3.22.7, "Water Operations Management Team," and, if necessary, the procedure in the "Directors" section above.