BUREAU OF RECLAMATION

Action 5

Operation Plan

for the Central Valley Project and State Water Project

December 2025

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1. Introduction

The United States Department of the Interior, Bureau of Reclamation (Reclamation) operates the Central Valley Project (CVP) for the congressionally authorized purposes of: (1) river regulation, improvement of navigation, and flood control; (2) irrigation and domestic uses, and fish and wildlife mitigation, protection, and restoration; and (3) power, and fish and wildlife enhancement. The California Department of Water Resources (DWR) operates the State Water Project (SWP) for the primary purpose of water supply deliveries and flood control, and the SWP provides additional benefits including power generation and environmental stewardship. DWR and Reclamation coordinate the operations of the SWP and the CVP under the terms of the 1986 Agreement Between the United States of America and the State of California for the Coordinated Operation of the Central Valley Project and the State Water Project as amended in 2018 ("COA") and as provided for under Public Law 99-546. COA provides for Reclamation and DWR to coordinate operations for meeting Sacramento Valley in-basin uses (the legal uses of water in the Sacramento Basin and include the water required to meet water quality objectives for Municipal and Industrial (M&I), agriculture, and fish and wildlife beneficial uses) and other operational requirements. Operation of the CVP and SWP also provides recreation and water quality benefits.

The action area covers CVP service areas and the operation of CVP dams, power plants, diversions, canals, gates, and related Federal facilities located on the watersheds of Clear Creek; the Sacramento, American, Stanislaus, and San Joaquin rivers; and CVP and SWP facilities in the Sacramento–San Joaquin Delta (Delta) and Suisun Marsh and Bay. Figure 1 shows a simplified hydrologic topology and the facilities operated in the action area.

Reclamation plans the operation of the CVP by projecting monthly, on a 12-month lookahead cycle, an "operations outlook" for how available water resources can best meet regulatory requirements and water supply purposes, including considerations for public health and safety, wildlife refuges, senior water rights, water quality, fishery needs, other environmental requirements, and water service or repayment contracts. In most years, the combination of storage and runoff into CVP reservoirs and the Central Valley, after meeting statutory requirements, is not enough to fully meet CVP contractor demands and shortages occur. The water available for delivery to CVP contractors is determined by an administrative process, referred to as "allocations," that considers storage, forecasted inflow, system accretions and depletions, facility limitations, and project requirements under the operations outlook. The estimate of available water supply in the north of Delta system, along with the anticipated quantity of water needed to meet requirements throughout the year (such as State Water Resources Control Board (State Water Board) Water Right Decision 1641 [D-1641]), determine the north of Delta allocations. The estimate of water supply upstream, previously stored water south of the Delta (in San Luis Reservoir), and the potential conveyance capability through the Delta determine south-of-Delta allocations. The M&I Water Shortage Policy determines the quantity of water during shortages for M&I and agricultural uses, for those water service and repayment contractors that reference the policy.

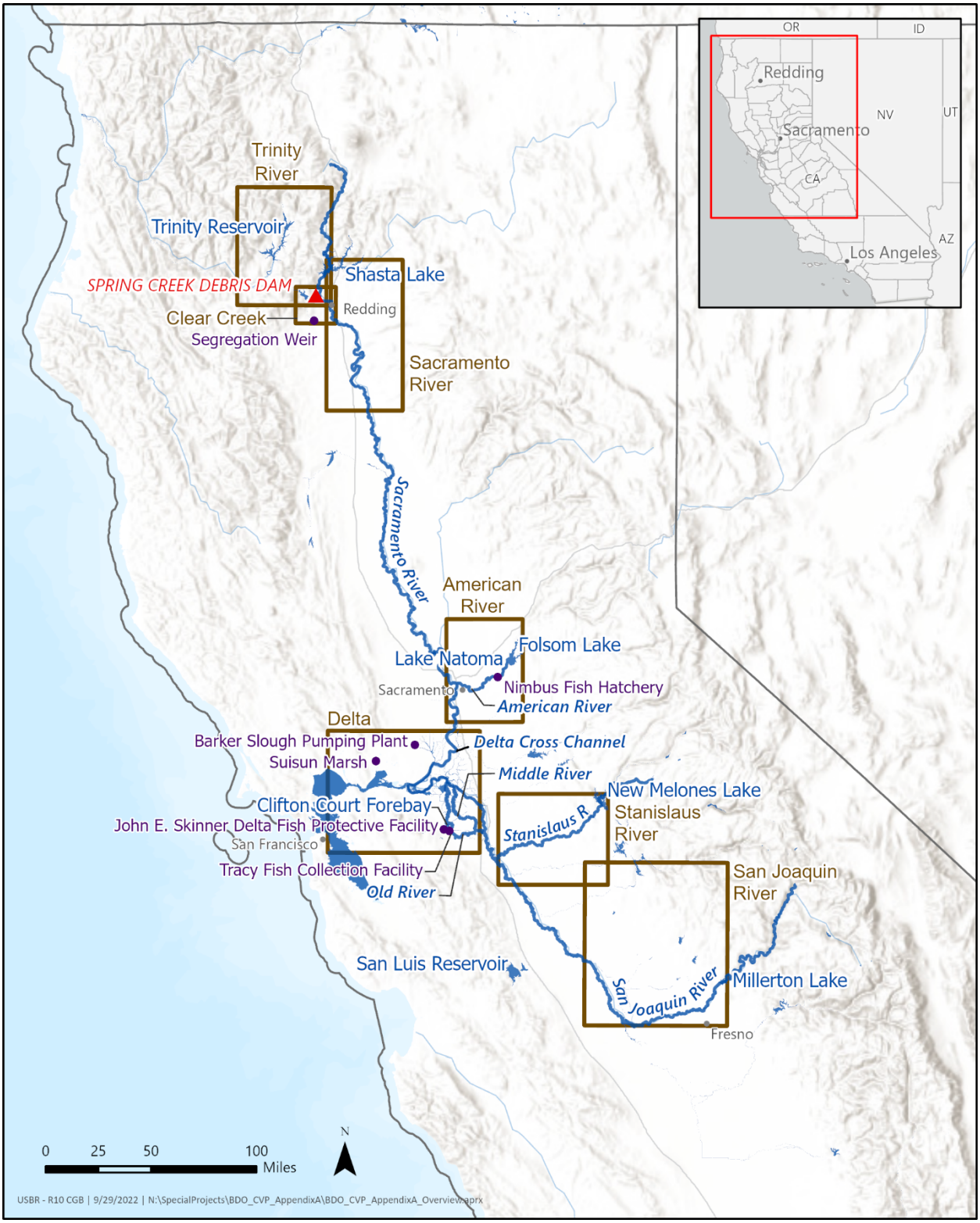

Figure 1. Overview of the Facilities Operated in the Proposed Action

No later than February 15, Reclamation makes "Critical Year" determinations for Central Valley Project Improvement Act (CVPIA) wildlife refuges under Refuge Water Supply Agreements and

senior water right holders under Sacramento River Settlement Contracts, the San Joaquin River Exchange Contract, and San Joaquin River Settlement Contracts, as described by those contracts and agreements. Depending upon hydrologic conditions, the determination may be updated.

On or about February 20 of each year, Reclamation provides an initial declaration of the water made available under water service and repayment contracts, an "Initial Allocation." Water service and repayment contracts generally run from March through February. Beginning in February, Reclamation prepares forecasts of water year runoff using precipitation to date, runoff to date, and snow water content accumulation. Reclamation typically updates forecasts of runoff and operations plans at least monthly through May. If the water initially anticipated to be available is no longer likely to be available, Reclamation provides a reduced allocation and notifies the water contractors that less water will be available for delivery. This approach is generally based on a 90% exceedance forecast and is intended to minimize the frequency of drier or warmer conditions than forecasted and avoid situations where a previous allocation for fisheries and agriculture cannot be supported. Reclamation may execute temporary contracts, not to exceed one year, for delivery of an unusually large water supply not otherwise storable or infrequent and otherwise unmanaged flood flows[1]. Reclamation may make water available under the water service and repayment contracts in addition to the allocation and consistent with legal obligations[2]. Under the Accelerated Water Transfer Program, Reclamation may transfer water within counties, watersheds, or other areas of origin without showing it as having been consumptively used or irretrievably lost. Actions to make water available are described in the Seasonal Operations sections for each CVP and SWP facility and modeled to identify changes in river flows.

DWR similarly 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. As the water year unfolds, Central Valley hydrology and water supply delivery estimates (Table A Deliveries) are updated using known information and conservative forecasts of future hydrology. DWR may deliver water that is surplus to Table A Deliveries (Article 21 water). Feather River Service Area contracts provide the terms for DWR to avoid interference with claimed senior water rights on the Feather River.

The Fish and Wildlife Coordination Act and the CVPIA, among others, authorize Reclamation to operate, in part, for fish and wildlife project purposes, undertake projects for habitat restoration and facility improvements, and to improve scientific understanding through developing models and supporting data. Following the 1995 Bay-Delta Accord, Reclamation and DWR operate the CVP and SWP to meet certain water quality control plan requirements for Delta outflow and salinity under D-1641. The responsibilities of DWR and Reclamation for senior water rights on the Sacramento River, Feather River, and in the Delta, as well as other regulatory requirements are coordinated through the 2018 amended COA.

This Operation Plan is organized as follows:

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[1] Section 215 of the Reclamation Act

[2] Paragraph 3(f) of Water Service and Repayment Contracts

- **Watersheds:** basin-by-basin description of facilities and the proposed operation for fish and wildlife, water supply, and power generation including proposed conservation measures to promote the recovery and/or to minimize or compensate for adverse effects of operation on federally listed species.

- **Monitoring:** the long-term evaluation of performance to assess overall effectiveness over time. Although each watershed has unique requirements, Reclamation and DWR integrate monitoring across watersheds.

- **Storage and Conveyance Framework Programmatic:** Review of the Sites Reservoir Project (Sites) and Delta Conveyance Project at a programmatic level, without seeking incidental take and related terms and conditions.

- **Drought:** actions to recognize extreme dry conditions may occur during operations. The highly cyclical nature of California hydrology and the resulting effect on species warrants special consideration for operation during droughts. Although each drought is unique, contingency planning can facilitate a response.

- **Governance:** ongoing engagement by Reclamation and DWR with U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), interested parties, and the public following completion of Biological Opinions and a Record of Decision.

- **Adaptive Management:** science and decision analytic-based approach to evaluate and improve actions, with the aim to reduce uncertainty over time and increase the likelihood of achieving and maintaining desired management objectives.

Each subsequent watershed section highlights authorizing legislation and requirements under the regulations, contracts, and agreements. Watershed sections identify ongoing efforts in the baseline that mitigate the effects of the operation of the CVP and SWP and for which Reclamation and DWR are not consulting nor reinitiating consultation on as part of this alternative. These programs have existing environmental compliance, agreements, and/or contracts with severable utility. These activities are in the baseline and may mitigate the effects of the operation of the CVP and SWP, some of which have been described in previous consultations and implemented.

2. Sacramento River

Reclamation operates and maintains the Shasta Division of the CVP for flood control and navigation, M&I and agricultural water supplies, fish and wildlife, hydroelectric power generation, Sacramento River water quality, and Delta water quality. Facilities include the Shasta Dam and Power Plant, Keswick Dam and Power Plant, and a Temperature Control Device (TCD) on the upstream face of Shasta Dam (Figure 2).

Major facilities in the Sacramento Division of the CVP include the Red Bluff Pumping Plant, Tehama-Colusa Canal, and Corning Canal. Agricultural deliveries provide for the irrigation of over 150,000 acres of land in Tehama, Glenn, Colusa, and Yolo Counties. The Red Bluff Pumping Plant is the intake for the Tehama-Colusa Canal and the Corning Canal. Water is diverted from the Sacramento River approximately 2 miles southeast of Red Bluff through the 2,500 cfs, screened Red Bluff Pumping Plant. In 2011, Reclamation permanently welded the Red Bluff Diversion Dam gates in the open position.

Imports from the Trinity River Basin (Trinity River Division) are delivered to the Sacramento River for downstream needs via two pathways: released from Whiskeytown Reservoir to Clear Creek and joins the Sacramento River at the mouth of Clear Creek south of Redding or delivered to Keswick Reservoir through the Spring Creek Tunnel and Power Plant where water mixes with releases from Shasta Reservoir and is released from Keswick Dam.

For more information on statutory, regulatory, and contractual requirements, see Appendix A, *Facilities Description*:

- Section 7 of the Flood Control Act of 1944
- Public Law 74-392 CVP Re-Authorization Act
- Public Law 81-839 Sacramento Valley Canals
- Central Valley Project Improvement Act (CVPIA)
- State Water Board Decision 990
- State Water Board Water Rights Order 90-5
- State Water Board Water Rights Order 91-1
- State Water Board D-1641
- Settlement Contracts
- Exchange Contracts

- Water Service and Repayment Contracts

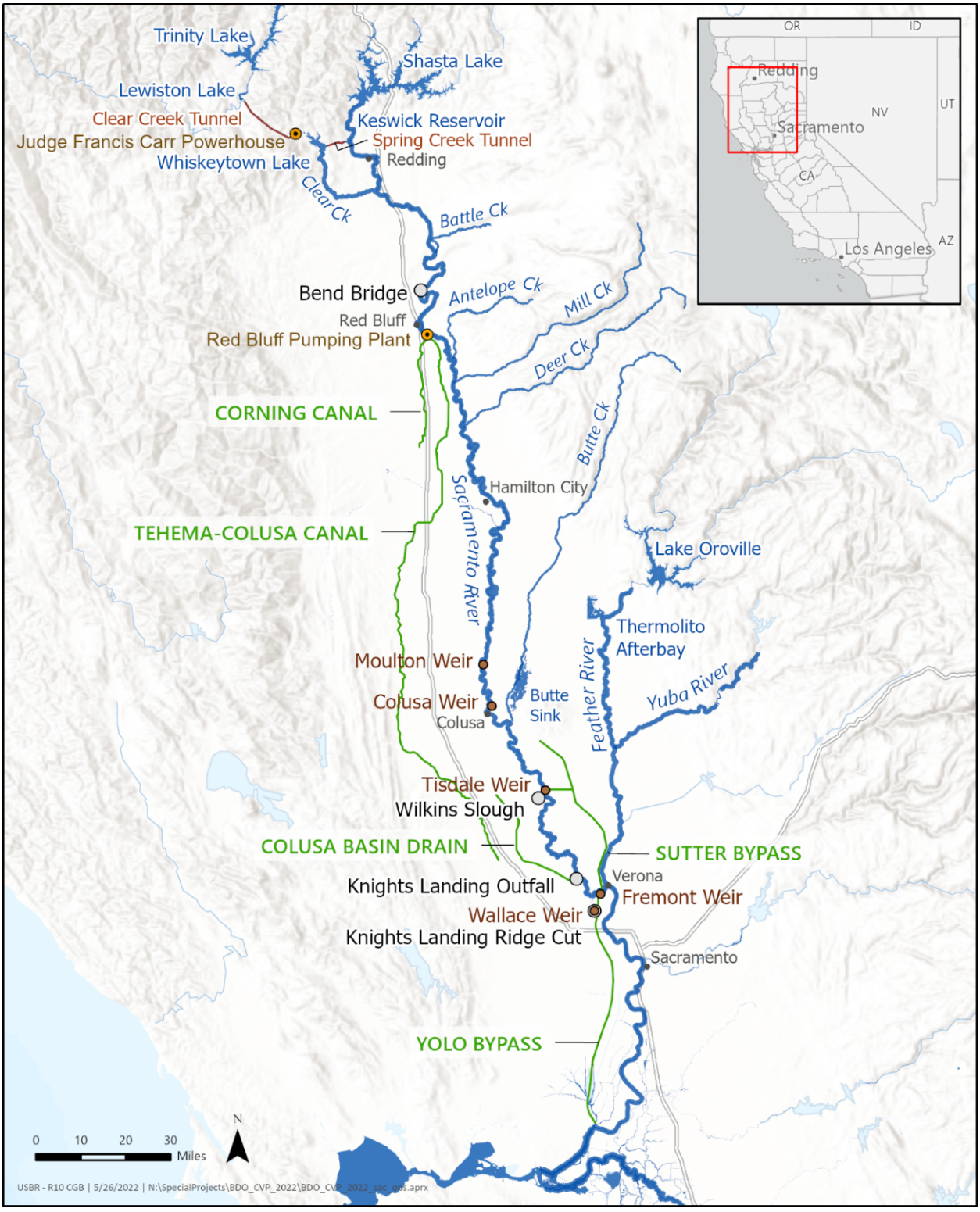

Figure 2 Facilities on the Sacramento River in the Shasta and Sacramento Divisions, including Flood Control Weirs and Bypasses

Programs in the environmental baseline to highlight:

- Spawning and Rearing Habitation Restoration
- Sacramento River Settlement Contractors Drought Protection Program; Winter-run Action Plan

2.1 Seasonal Operations

Reclamation operates Shasta Dam in the winter primarily for flood control and minimum flows in the Sacramento River and in the Delta. With flashboards installed on top of the drum gates that raise the elevation to 1,067 feet, the maximum capacity of Shasta Reservoir is 4.552 MAF. For the flood season, U.S. Army Corps of Engineers (USACE) provides a flood control diagram that specifies by date a top of conservation pool storage. Flood control operations are based on regulating criteria developed by the USACE pursuant to the provisions of the Flood Control Act of 1944. Flood control requirements reserve up to 1.3 million acre-feet (MAF) of space (flood control pool) behind Shasta Dam, leaving 3.2 MAF of space (conservation pool) for storage management during the winter flood season. Flood operational criteria target flow rates below 100,000 cfs at Bend Bridge for the protection of downstream populations; therefore, reservoir elevations may temporarily exceed the top of the conservation pool and encroach into flood space to limit downstream flows while peak flows from other tributaries are able to move through the system. In the winter, when not releasing for flood control, Reclamation seeks to store inflows to Shasta Reservoir and release the minimum flows necessary to meet downstream requirements. State Water Board Water Rights Order 90-5 provides a target for minimum releases from Keswick Reservoir from September through February, the 1937 Act includes consideration for navigation at Wilkins Slough, and State Water Board D-1641 provides flow standards in the Delta. Reclamation generally maintains flows of at least 5,000 cubic feet per second (cfs) at Wilkins Slough year-round; these flows may be reduced in low-storage or drought years. Reclamation may make releases above the minimum to maintain fall-run Chinook salmon redds in wetter hydrologic year types when storage levels are higher in Shasta Reservoir.

In the spring, when not operating for flood control, Reclamation seeks to minimize releases and store inflow to optimize the filling of CVP reservoirs by the end of the flood control season (typically the end of May). Higher storage improves the ability to meet downstream temperature requirements and increases the ability to make releases later in the year for water supply. Accretions (flows from non-project creeks into the Sacramento River below Shasta Dam) reduce the need for additional releases from Shasta Reservoir and help to meet both instream demands and Delta outflow requirements. Wetter years with high accretions may allow Reclamation to store water in the spring and operate mostly for flood control. Drier years with lower accretions may require Reclamation to make releases from Shasta Reservoir for downstream requirements throughout the spring season. Toward the middle to end of spring, instream diversion demands increase on the mainstem Sacramento River and require releases above minimums at Keswick Reservoir Reclamation operates to flow objectives at Wilkins Slough to support diversion by Sacramento River Settlement (SRS) Contractors with a prior entitlement to water in the Sacramento River, for deliveries to CVPIA wildlife refuges, and for deliveries to CVP water

service and repayment contractors at the Red Bluff Pumping Plant. The majority of these diversions typically occur mid-April through November with variations depending on hydrology.

Delta salinity and outflow requirements may necessitate additional releases from Shasta Reservoir. When system-wide demands require augmenting flows, Reclamation coordinates imports from the Trinity Basin, releases by DWR from Oroville Reservoir, and releases from Folsom Reservoir. Each reservoir has factors to consider including instream requirements, amounts in storage, forecasted inflow, and refill potential. The 2018 COA describes the CVP portion of Delta outflow requirements as an in-basin use. Reclamation balances releases for the CVP portion of Delta outflow requirements between Shasta and Folsom Reservoirs to maximize storage in each reservoir and minimize negative impacts between CVP tributaries. When increased releases are necessary to meet Delta needs, Reclamation generally first adjusts exports, then releases from Folsom Reservoir while releases from Shasta Reservoir travel down the Sacramento River. Once releases from Shasta Reservoir arrive in the Delta (about 5 days' travel time), releases from Folsom Reservoir can be adjusted to balance the demands on each reservoir. When Reclamation is able to export water from the Delta during periods of low demands south-of-Delta, Reclamation can store more water in San Luis Reservoir south of the Delta. Maximizing exports in the spring reduces the reliance on stored water later in the year for meeting later season demands that exceed exported water.

Summer operational considerations include releases for temperature control, to support essential features of designated critical habitat, instream diversion demands, Delta outflow, Delta salinity, and exports. In-river temperatures downstream of Keswick Dam can be controlled via two methods. The first is thermal mass, by changing release volume or shifting releases between Trinity imports and Shasta Reservoir, and the second is selective withdrawal of different water temperature through the TCD. Determination of which method to use is made daily as operators balance releases from multiple reservoirs to meet downstream needs. Releases in the summer meet temperature objectives, support essential features of critical habitat and support water supply deliveries. Releases from Shasta Reservoir typically begin increasing in April as storm frequency decreases, air temperatures increase, and system-wide demands increase. Peak releases from Shasta Reservoir typically occur June through August and begin to decrease from the peak sometime in August or September. Occasionally, in wetter years, high storage levels through the summer may result in a need to release higher than normal flows in early fall to meet flood control requirements for the next water year. Consideration of fall conditions may also warrant measures for drought protection, including rebalancing of storage between reservoirs.

In the fall, Reclamation's objective is to reduce Shasta Dam releases and rebuild storage in Shasta Reservoir. Reclamation balances fall operations based on highly variable conditions: temperature control (dependent on winter-run Chinook salmon emergence timing), maintenance of winter-run Chinook salmon redds (dependent on spawning depths), instream diversion demands on the mainstem of the Sacramento River upstream and downstream of Wilkins Slough (dependent on seasonal planting and wildlife refuges), minimizing fall-run Chinook salmon redd dewatering (dependent on late-summer flows and fall spawning timing), and stabilizing releases through fall-run Chinook salmon egg and alevin incubation. The remaining coldwater pool in Shasta Reservoir is usually limited in the fall at the end of the temperature management season. Release reductions from Shasta Reservoir early in the fall consider that some winter-run Chinook salmon eggs and alevin are still incubating, significant instream diversion demands (e.g., rice

decomposition) remain on the mainstem of the Sacramento River between Keswick Dam and Wilkins Slough and, depending on conditions, Delta requirements may require upstream reservoir releases for Delta outflow under applicable statutory or regulatory requirements. If early fall flows drop substantially after fall-run Chinook salmon spawn at high river stages, their redds may be dewatered when flows are later reduced to rebuild storage.

2.2 Ramping Rates

Ramping rates address the stranding risk stressor by limiting the rate and timing of flow decreases. Under Order 90-5, the release rate from Keswick Dam from September through February shall not decrease more than the following rates to minimize stranding of salmon.

- Releases shall not be decreased more than 15% in a 12-hour period
- Releases shall not be decreased more than 2.5% in a 1-hour period

In addition to the requirements under Order 90-5, ramping rates for Keswick Dam between July 1 and March 31 would be reduced between sunset and sunrise.

- Keswick Dam releases >6,000 cfs, reductions in releases may not exceed 15% per night, and no more than 2.5% per hour
- Keswick Dam releases 4,000 cfs to 5,999 cfs reductions in releases may not exceed 200 cfs per night, or 100 cfs per hour
- Keswick Dam releases between 3,250 cfs and 3,999 cfs; reductions in releases may not exceed 100 cfs per night

Reclamation, through Governance, may make deviations from ramping rates to conserve storage.

2.3 Minimum Instream Flows

Minimum instream flows address the water temperature, outmigration cue, stranding risk, pathogens and disease stressor for winter-run Chinook salmon, spring-run Chinook salmon, and steelhead by preserving storage in Shasta Reservoir.

Reclamation, through Governance, may reduce releases from Keswick Dam to conserve storage if accretions maintain 3,250 cfs at the SAC gage. Under certain hydrologic circumstances during fall and winter months, side flows from creeks within and around the City of Redding may experience short term periods of high flows in response to major storm events.

Condition 2 of Order 90-5 requires Keswick Dam releases of 3,250 cubic feet per second (cfs) from September through February, except during critical dry years or emergencies.

2.4 Sacramento River Settlement Contractor Resolution

The SRS Contractors approved *A Resolution Regarding Salmon Recovery Projects in the Sacramento River Watershed, Actions Related to Shasta Reservoir Annual Operations, and Engagement in the Ongoing Collaborative Sacramento River Science Partnership Effort*. Pursuant to the resolution, the SRS Contractors will continue to participate in and act as project champions for future Sacramento Valley Salmon Recovery Program projects, subject to funding, regulatory approvals, acceptable regulatory assurances, and full performance of the SRS Contracts. In addition to the 25% reduction during Critical Years as set forth in the SRS Contracts, the types of actions that may be considered include, but are not limited to: Spring Diversion Delays, Delayed Transfers, and Rice Decomposition Diversion Smoothing.

Shasta Framework Actions

Fall

- Rice Decomposition Smoothing
- Wilkins Slough Oct. Max. Flows
- Fall Releases Ramp Down
- Fall-Run Redd Maintenance and Reservoir Refill

Spring

- TCCA Early Season Diversion
- CVP Pulse Flows
- VA Flow Measures

Drought

- Rebalancing
- CVP Contract Allocation Reduction
- Wilkins Slough Min. Flow Relief
- SRS Contractors Spring Diversion Delays
- SRS Contractors Water Transfer Delays
- Refuges Water Supply Reduction

Water Temperature Management

The SRS Contractors will meet and confer with Reclamation, NMFS, and other agencies to determine if there is a role for the SRS Contractors in connection with Reclamation's operational decision making for Shasta Reservoir annual operations. This determination will include consideration of what actions are feasible, consistent with the terms of the SRS Contracts.

2.5 Shasta Operations Framework

The Shasta Operations Framework seeks to provide drought protection and maximize suitable temperature regimes for the critically endangered Sacramento River Winter-run Chinook salmon. The strategy uses a framework adapted from the multi-year drought sequence experienced in Victoria, Australia (Mount et al. 2016, "Victorian Objectives"). The framework includes three Bins that are each divided into a standard (Bin A) and drought protection (Bin B). The B-bins are intended to increase the priority of storage conservation to address the risk that the ensuing year could be a drought. Bins are defined as follows:

- Bin 1: End of April Storage ≥ 3.7 MAF

  A. End of September Storage ≥ 3.0 MAF

  B. End of September Storage ≥ 2.4 MAF

- Bin 2: End of April Storage ≥ 3.0 MAF

A. End of September Storage ≥ 2.2 MAF

B. End of September Storage ≥ 2.0 MAF

- Bin 3: End of April Storage < 3.0 MAF

  A. End of September Storage ≥ 2.0 MAF

  B. End of September Storage < 2.0 MAF

Reclamation, through Governance, will identify a Bin in February and update the Bin monthly as needed through at least mid-April. The approach establishes biological objectives for each Bin and identifies potential actions based on forecasted End-of April (EOA) storage and forecasted End-of September (EOS) storage indicators.

2.6 Sacramento River Settlement Contractors Rice Decomposition Diversion Smoothing

SRS Contractors and CVP Water Service and Repayment Contractors will coordinate their diversions to lower peak demands in October and may extend diversions under the SRS Contractors contracts into November. Reclamation would release flows based on the coordinated schedule provided it does not impact storage. Rice decomposition diversion smoothing addresses the redd dewatering stressor on fall-run Chinook salmon by reducing higher releases relative to the base winter flow release rate from Keswick Dam.

2.7 Wilkins Slough October Maximum Flows

The Wilkins Slough October maximum flows address the redd dewatering and redd quality stressors. Reclamation would target October Wilkins Slough flows as follows:

- Bin 1: 5,000-7,000 cfs.
- Bin 2: 5,000-7,000 cfs.
- Bin 3: 3,250 – 5,000 cfs

Higher flows may be necessary at times. Flows beyond the ranges will be discussed through Governance with a comparison of expected biological and storage tradeoffs including the potential for these higher flows to increase the likelihood of a change in bin the following year.

2.8 Fall Release Ramp Down (November)

The Fall Ramping Down addresses the water temperature stressor for winter-run Chinook salmon by allowing Shasta Reservoir to refill. Reclamation, through Governance will determine the appropriate ramp down date after evaluating tradeoffs between storage, next year's temperature management, winter-run Chinook salmon redd dewatering and fall run Chinook salmon stranding and redd maintenance. The goal is to maximize the available coldwater pool for the next year while minimizing dewatering of the current year's winter-run Chinook salmon redds.

2.9 Fall-Run Chinook Salmon Redd Maintenance and Reservoir Refill (December – February)

Fall-Run Chinook Salmon Redd Maintenance addresses the redd dewatering stressor on fall-run Chinook salmon by reducing the chances of an initial temporary dewatering. From December 1 through the end of February, Reclamation would operate to a consistent fall and winter baseflow based on end of September storage unless additional releases are necessary for flood conservation space or meeting downstream purposes (Table 1).

Table 1. Keswick Dam December through February Default Release Schedule determined by End-of-September Storage

Keswick Release (cfs)	Shasta End-of-September Storage (MAF)
3,250	≤ 2.4
4,000	≤ 2.8
4,500	≤ 3.2
5,000	> 3.2

cfs = cubic feet per second; MAF = million acre-feet

Reclamation, through Governance, may modify base flows based on developing hydrology to increase storage for cold water pool.

- Bin 1: Minimum fall and winter flows would be expected to be in the 4,000 – 5,000 cfs range to provide increased fall run habitat or higher if needed for storage management.

- Bin 2: Reclamation expects to begin ramping down to the minimum flow of 3,250 cfs in late October or early November.

- Bin 3: After the irrigation season, Reclamation expects to begin ramping down to the minimum flow of 3,250 cfs as soon as possible given deliveries, Delta conditions and winter-run redd dewatering concerns.

The base flow is intended to balance natural fall-run Chinook salmon production, the risk of required storage management or flood control releases, and the refill of Shasta Reservoir to build storage for the following year. Maintaining higher than minimum flows during the fall period support aquatic habitat and avoids redd dewatering that would later be supported by flood releases.

2.10 Tehama-Colusa Canal Authority (TCCA) Frost Protection and Early Season Diversions

Reclamation, through Governance, may provide an allocation by mid-February of up to 30 TAF to north of Delta agriculture to avoid significant impacts while not risking a Bin 3 year. In some years, a conservative forecast may warrant a 0% CVP north of Delta agricultural allocation early in the year (February and March) even though a non-zero allocation is expected in the coming months as the hydrology matures. This may be due to late precipitation, lower storage from the previous year or higher regulatory requirements. A small allocation prevents detrimental impacts to agricultural lands due to the gap in available supplies between the previous contract year (which ends in February) and when transfer water may become available (April).

2.11 Central Valley Project Pulse Flows (April-May)

Pulse flows address the outmigration cue stressor on steelhead juveniles and spring-run Chinook salmon juveniles by providing flow cues for outmigration and increasing the outmigration travel rate. Reclamation would release up to 150 thousand acre-feet (TAF) in pulse flow(s) each water year, typically in the spring when the pulse does not interfere with the ability to meet water temperature objectives or other anticipated operations of the reservoir. Reclamation, through Governance, may discuss the plan and make any appropriate and/or necessary refinements prior to implementation.

2.12 Voluntary Agreement Flow Measures from (April-May)

Under the Sacramento River *Flow Measures from Voluntary Agreements (VAs)* conservation measure the SRS Contractors will make water available under VAs, and Reclamation may operate Shasta Reservoir to advance inflows to the Delta.

2.13 Rebalancing Between Central Valley Project Reservoirs

The rebalancing between other CVP Reservoirs conservation measure addresses the Water Temperature stressor.

- Bin 1: light system tradeoffs for supporting higher Shasta storage (up to 3.0 MAF) with minimal impacts to other parts of the system during monthly forecasting process.

- Bin 2: moderate system-wide tradeoffs and potential transfer modifications for temperature and storage goals.
- Bin 3: moderate system-wide tradeoffs with moderate impacts to other parts of the system.

Reclamation would coordinate rebalancing through Governance.

2.14 CVP Water Service and Repayment Contractor Allocation Reductions

Reclamation will reduce Shasta Reservoir releases for water supply (CVP allocations) under Bin 2B and 3 conditions to increase end of September Shasta storage. In extremely dry years or in multi-year droughts, it is possible that these actions will not achieve an end-of-September storage above 2.0 million acre-feet. Reclamation will reduce Shasta releases for water supply (CVP allocations) to only that needed for meeting public health and safety demands, including minimum salinity levels in the Delta.

2.15 Wilkins Slough Minimum Flow Relief (April-September)

Under the *Wilkins Slough Minimum Flow Relief* conservation measure, summer flows would be lower than 5,000 cfs in the driest of years when Wilkins Slough is controlling and there is flexibility to have a Wilkins Slough flow below 5,000 cfs.

- Bin 1: Reclamation, through Governance, would target 5,000 cfs to maintain water levels in the Sacramento River for senior water right holders under the SRS Contracts.
- Bin 2: Reclamation, through Governance, will coordinate minimum flows for biological objectives and obligations to senior water right holders under the SRS Contracts.
- Bin 3: Reclamation, through Governance, will target a minimum flow of 3,400 cfs in coordination with senior water right holders under the SRS Contracts.

Lower Wilkins Slough flows may allow Reclamation to reduce releases from Shasta Reservoir to conserve storage.

2.16 Sacramento River Settlement Contractors Spring Diversion Delays

Reclamation may request that the SRS Contractors delay diversions in the spring to increase the likelihood that Shasta Reservoir storage level of 3.8 MAF to reach the upper gates on the TCD to support improved water temperature management on the Sacramento River.

2.17 Sacramento River Settlement Contractors Delayed Transfers

Reclamation may request that the SRS Contractors shift timing of delivery of transfer water to help improve water temperature management and/or protect against winter-run Chinook salmon redd dewatering and fall-run Chinook salmon stranding.

2.18 Refuge Coordination for Instream Flow, Lake Levels and Refuge Needs

Reclamation will coordinate with USFWS to maintain summer deliveries of Level 2 supplies to Sacramento Valley CVPIA refuges to provide essential dry year habitat for Giant Garter Snake, Western Pond Turtle, Tricolored Blackbirds and migratory waterfowl in a manner consistent with refuge contracts and agreed upon operational priorities. If conditions remain dry through the fall, Reclamation and USFWS will coordinate on how to address instream flow objectives, lake levels and refuge needs. Reclamation will continue to utilize Level 4 to supplement supplies for refuges in drier years when storage and coldwater pool are limited.

2.19 Water Temperature Management

Water temperature management addresses the water temperature stressor for winter-run Chinook salmon. Water temperature management is important for salmonid adult holding, spawning, and egg incubation, and juvenile rearing. Reclamation will operate the Shasta Dam TCD to manage water temperatures below Keswick Dam.

Reclamation may begin temperature management as early as March 1st to target water temperatures of 58.0° F daily average at the Sacramento River above Clear Creek gage (CCR) during the winter-run Chinook salmon pre-spawning period. Reclamation, through Governance, may propose a different temperature based on potential impacts to winter-run Chinook salmon spawning and egg incubation.

Reclamation, through Governance, will prepare a Temperature Management Plan by the end of May. The Plan will include projected reservoir releases, assumed meteorological conditions, anticipated water temperatures and target locations, and temperature-dependent mortality (TDM) estimates. The plan will use conservative assumptions, generally a forecast with 90% exceedance in the aggregate when considering hydrology and meteorology to develop conservative water temperature forecasts. Daily average temperature targets include:

- Bin 1: 53.5°F downstream of CCR to manage the range of winter-run Chinook salmon spawning habitat
- Bin 2: 53.5°F at CCR during the winter-run spawning and egg incubation period and shape temperatures through Governance.

- Bin 3: 53.5°F upstream of CCR for the most critical period during the winter-run Chinook salmon spawning and egg incubation period.

Reclamation will operate the Shasta Dam TCD to manage water temperatures below Keswick Dam according to the TMP and may make updates, through Governance.

Reclamation will collect temperature profile measurements in Whiskeytown, and Trinity reservoirs every month at 25 ft intervals. For Shasta Reservoir, Reclamation will collect temperature profiles as described in Table 2.

Table 2. Temperature Profile Measurements for Shasta Reservoir

Dates	Profiles
Dec. – Feb.	Monthly at 25 ft. Intervals
Mar. – April	Every Two Weeks at 5 ft. Intervals
May – Nov. 15	Every Week at 5 ft. Intervals
Nov. 15 – Nov. 30	Every Two Weeks at 5 ft. Intervals

Reclamation will monitor water temperature downstream of Shasta Dam. If monitored water temperatures exceed the average daily target temperature for three consecutive days, Reclamation will notify NMFS through Governance.

The application of Victorian Objectives will be applied to support a greater habitat extent, duration and frequency on the Sacramento River below Keswick Dam, when storage resources allow, water temperature management will expand habitat for early or later spawners, spawners further downstream, and juveniles rearing.

3. Clear Creek

As a component of the Trinity Division of the CVP, Reclamation operates and maintains Whiskeytown Dam on Clear Creek, with a capacity of 241,100 acre-feet, for irrigation and other beneficial uses, hydroelectric power generation, fish and wildlife, recreation, and upper Sacramento River temperature control and water rights requirements. Whiskeytown Reservoir provides reregulation of trans-basin imports from the Trinity River. Diversions from Lewiston Reservoir on the Trinity River through the Judge Francis Carr Powerhouse and the runoff from the Clear Creek drainage area flow into Whiskeytown Reservoir. Water from Whiskeytown Reservoir is released into Clear Creek, diverted through the Muletown Conduit, or diverted through the Spring Creek Tunnel and Spring Creek Powerplant into Keswick Reservoir. Whiskeytown Reservoir has two temperature curtains to pass cold water through the bottom layer and limit warming from Judge Francis Carr Powerhouse to the Spring Creek Powerplant.

Reclamation operates and maintains Spring Creek Debris Dam on Spring Creek, with a capacity of 5,870 acre-feet, for hydroelectric power generation and upper Sacramento River temperature control and water rights requirements. Spring Creek Debris Dam controls debris and contaminated runoff resulting from old mine tailings on Spring Creek, which would otherwise enter the Spring Creek Powerplant tailrace. Water from Spring Creek Debris Dam and Spring Creek Powerplant discharges into Keswick Reservoir.

Statutory, Regulatory, and Contractual Requirements, see Appendix A:

- Public Law 84-386 Trinity River Division
- Section 3406(b)(12) of CVPIA
- Instream Flow Preservation Agreement 2000 (Contract No. 00-WC-1719-B8)
- April 15, 2002, State Water Board permit, minimum flows
- 1980 Memorandum of Understanding (MOU) with California Department of Fish and Wildlife (CDFW) and State Water Board (Spring Creek Debris Dam)

Programs in the environmental baseline to highlight:

- Spawning and Rearing Habitation Restoration

3.1 Seasonal Operations

In the winter and spring, Whiskeytown Reservoir is operated to regulate flows for flood management. Starting in November, Reclamation will draw down Whiskeytown Lake by approximately 35 TAF to create flood management space, generally refilling in April or May.

USACE does not regulate Whiskeytown Reservoir for flood control. Operations at Whiskeytown Reservoir during flood conditions are complicated by its operational relationship with the Trinity River, Sacramento River, and upper Clear Creek. On occasion, imports of Trinity River water to Whiskeytown Reservoir may be suspended to avoid aggravating high flow conditions in the Sacramento Basin. Heavy rainfall events occasionally result in uncontrolled discharges to Clear Creek, through the Whiskeytown Gloryhole.

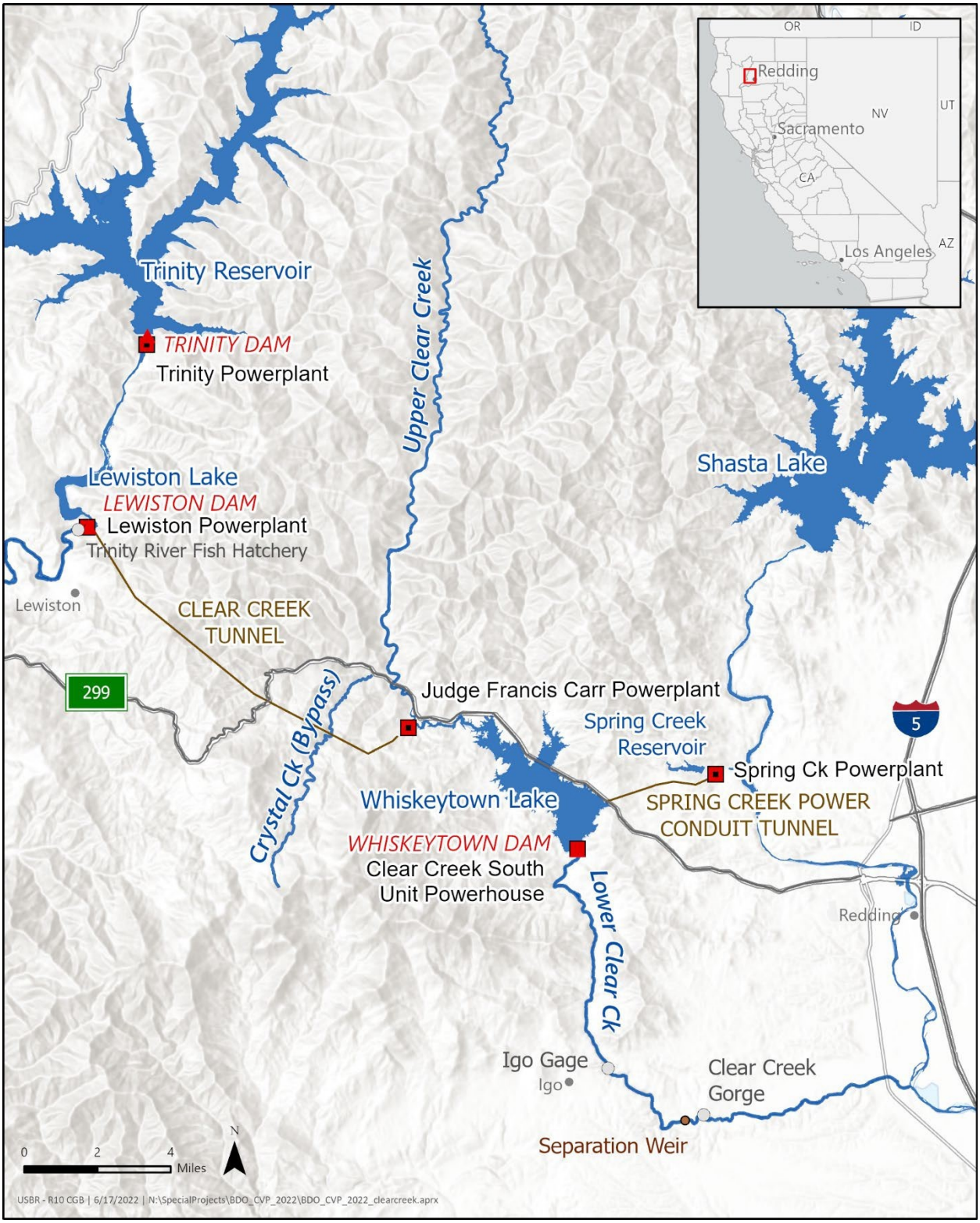

Figure 3. Facilities on Clear Creek in the Trinity Division of the CVP

During the summer and early fall, Reclamation operates to provide reservoir elevations as full as practical for recreation. Whiskeytown Reservoir is a major recreational destination with

recreational facilities administered by the National Park Service. Summer and fall Trinity imports help maintain Whiskeytown Reservoir elevations, provide cool water for releases to Clear Creek for temperature control objectives, decrease residence time in Lewiston Reservoir for Trinity River temperature control, and help maintain water temperature objectives in the Sacramento River by supplying water to Keswick Reservoir.

3.2 Ramping Rates

Ramping rates address the stranding risk stressor. Reclamation would use down ramping rates of up to 25 cfs per hour and schedule reductions in consideration of listed species behavior (e.g., diel movement patterns). Reclamation, through Governance, may develop a faster or slower down ramping rate on a case-by-case basis. Reclamation may vary from these ramping requirements during flood control.

3.3 Minimum Instream Flows (Seasonally Variable Hydrograph)

Minimum instream flows address habitat stressors. Reclamation would release water through Whiskeytown Dam to provide intra-annual variation to emulate natural processes. As provided in Figure 4 and Table 3, flows will oscillate over a 1-year period, with releases transitioning from 300 cfs in the winter, down to 100 cfs in the summer, and back to 300 cfs by the following winter. In critical years, Reclamation would target an average 150 cfs based on available water from Trinity Reservoir and attempt to maintain above 100 cfs.

Reclamation would schedule the hydrograph to maximize multi-species benefits through Governance. Reclamation may modify the timing and flow rates on a case-by-case basis. The flow schedule is subject to agreement by Redding Electric Utility for use of their facilities.

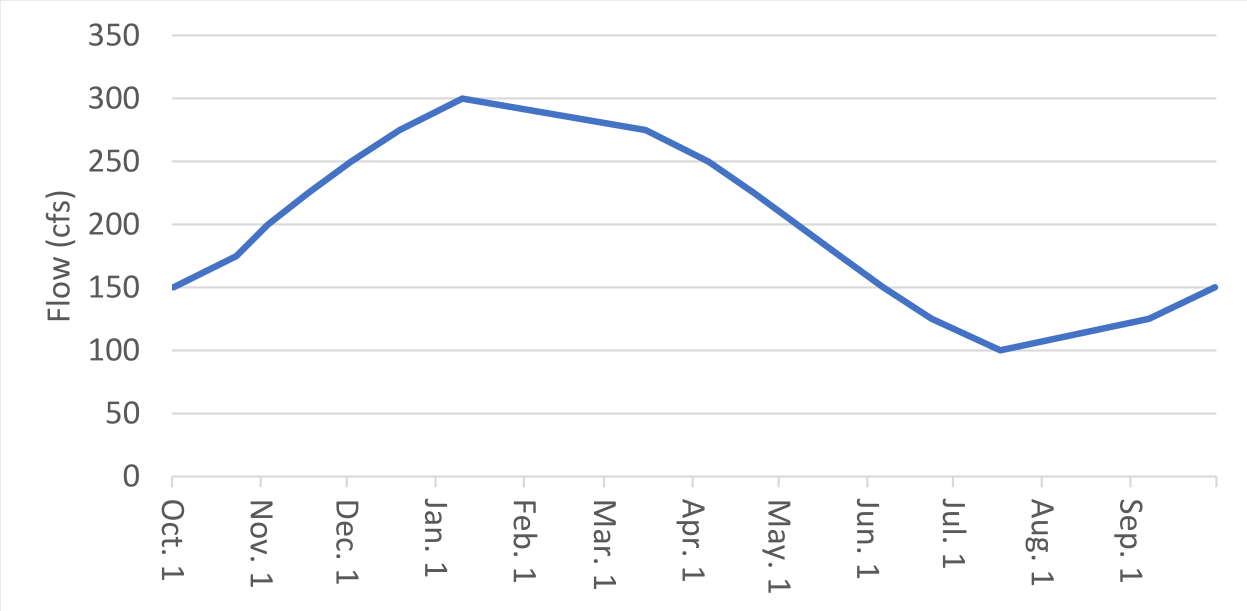

Figure 4. Clear Creek Seasonally Variable Hydrograph Minimum, Non-Critical Years

Table 3. Proposed Annual Clear Creek Flows Changes

Date	From (cfs)	To (cfs)
October 1	125	150
October 23	150	175
November 3	175	200
November 17	200	225
December 2	225	250
December 19	250	275
January 10	275	300
March 15	300	275
April 6	275	250
April 22	250	225
May 7	225	200
May 22	200	175
June 6	175	150
June 23	150	125
July 17	125	100
September 7	100	125

cfs = cubic feet per second

3.4 Pulse Flows

Pulse flows address migration cues stressors. After February 1, Reclamation would release up to 10,000 acre-feet from Whiskeytown Dam for channel maintenance, spring attraction flows, and to meet other physical and biological objectives, except in years where uncontrolled spill provided a similar function. If the Sacramento Valley Index is ≤ 5.4 (critical years), Reclamation would limit releases of pulse(s) flows to 5,000 acre-feet. The determination of water year type will be based on the Sacramento Valley Index (SVI), at 90% exceedance level.

Reclamation would develop pulse flow schedules through Governance and include measures (e.g., nighttime down ramping, slow down ramping rates, coordination with natural precipitation events) to mitigate for potential risks (e.g., potential juvenile fish stranding). Pulse flows will not exceed the 840 cfs safe outlet works capacity of Whiskeytown Dam.

3.5 Water Temperature Management

Water temperature management addresses adult water temperature and egg incubation stressors. Reclamation would target Whiskeytown Dam releases to not exceed the mean daily temperatures at Igo gauge:

- 61°F from June 1 through August 15
- 60°F from August 16 through September 15
- 56°F from September 16 through November 15

If two consecutive days of mean daily temperature are exceeded, and Reclamation determines additional water is available, then 25 cfs per day may be added to the base flow to address temperatures. Before spawning (in the late spring or summer) a return to base flow would occur when meteorological conditions allow. After spawning (later-summer or fall) flow changes for temperature management would be maintained until the base flow of the seasonal hydrograph rises to meet the elevated temperature release so as to avoid dewatering redds.

Water temperature management on Clear Creek is implemented through changes in guard gate configurations and flow manipulations. In dry, critical, or import curtailment years, Reclamation may not be able to meet these temperatures and would operate Whiskeytown Dam as close to these temperatures as practicable.

3.6 Segregation Weir

The segregation weir addresses competition, introgression, and broodstock removal stressors. Reclamation would place a segregation weir on Clear Creek typically between the Clear Creek Gorge Cascade and Clear Creek Road Bridge in late August to remain in place through early November. Reclamation, through Governance, would select the location based on channel cross-

section suitability for weir placement and the distribution of adult spring-run Chinook salmon holding locations. Previous placements have occurred at River Mile (RM) 8.2 or 7.5. Placement of the weir would occur before fall run Chinook salmon enter Clear Creek to minimize hybridization with spawning spring-run Chinook salmon and redd superimposition. Removal of the weir would occur after the peak of fall run Chinook salmon spawning when the risk of redd superimposition is very low. The weir location and timing protect most of the spring-run Chinook salmon utilizing Clear Creek, while minimizing effects on other salmonids.

4. American River

Reclamation operates and maintains the American River Division of the CVP for flood control, M&I and agricultural water supplies, hydroelectric power generation, fish and wildlife protection, recreation, and Delta water quality. Facilities include Folsom Dam, its reservoir (967 TAF capacity), power plant, temperature control shutters on the power plant intakes, and the Joint Federal Project auxiliary spillway, as well as the Nimbus Dam, Lake Natoma, Nimbus Power Plant, and Folsom South Canal (Figure 5). The CVP additionally delivers water to the Freeport Regional Water Project Intake. Releases from Folsom Dam are re-regulated approximately seven miles downstream by Nimbus Dam. Nimbus Dam creates Lake Natoma, which serves as a forebay for diversions to the Folsom South Canal and the Nimbus Fish Hatchery. Water diverted to the fish hatchery returns to the American River through four outfalls approximately 0.5 mile downstream of Nimbus Dam. Releases from Nimbus Dam to the American River pass through the Nimbus Power Plant, or the spillway gates.

Statutory, Regulatory, and Contractual Requirements, see Appendix A:

- Public Law 81-356 American River Development Act of October 14, 1949, ch. 690, 63 Stat. 852
- Public Law 89-161 Auburn-Folsom South Unit - Act of September 2, 1965, 79 Stat. 615
- Freeport Regional Water Authority Intake
- State Water Board D-893
- State Water Board D-1641
- Water Control Manual for Folsom Dam and Lake (June 12, 2019) and its October 16, 2018, NMFS Biological Opinion
- Water Forum MOU March 29, 2021

Programs in the environmental baseline to highlight:

- Nimbus Hatchery Genetics Management Plan
- Temperature Modeling Platform.
- Spawning and Rearing Habitat Restoration.
- Folsom Dam Raise and Temperature Control Shutters

4.1 Seasonal Operations

Folsom Reservoir is the main storage and flood control reservoir on the American River. Numerous other smaller non-CVP reservoirs in the upper basin provide hydroelectric generation and water supply without specific flood control responsibilities. The total upstream reservoir storage above Folsom Reservoir is approximately 820 TAF, and these reservoirs are operated primarily for hydropower production. Ninety percent of this upstream storage is contained by five reservoirs: French Meadows (136 TAF); Hell Hole (208 TAF); Loon Lake (76 TAF); Union Valley (271 TAF); and Ice House (46 TAF). Reclamation coordinates with the operators of these non-CVP reservoirs to aid in planning for Folsom Reservoir operations.

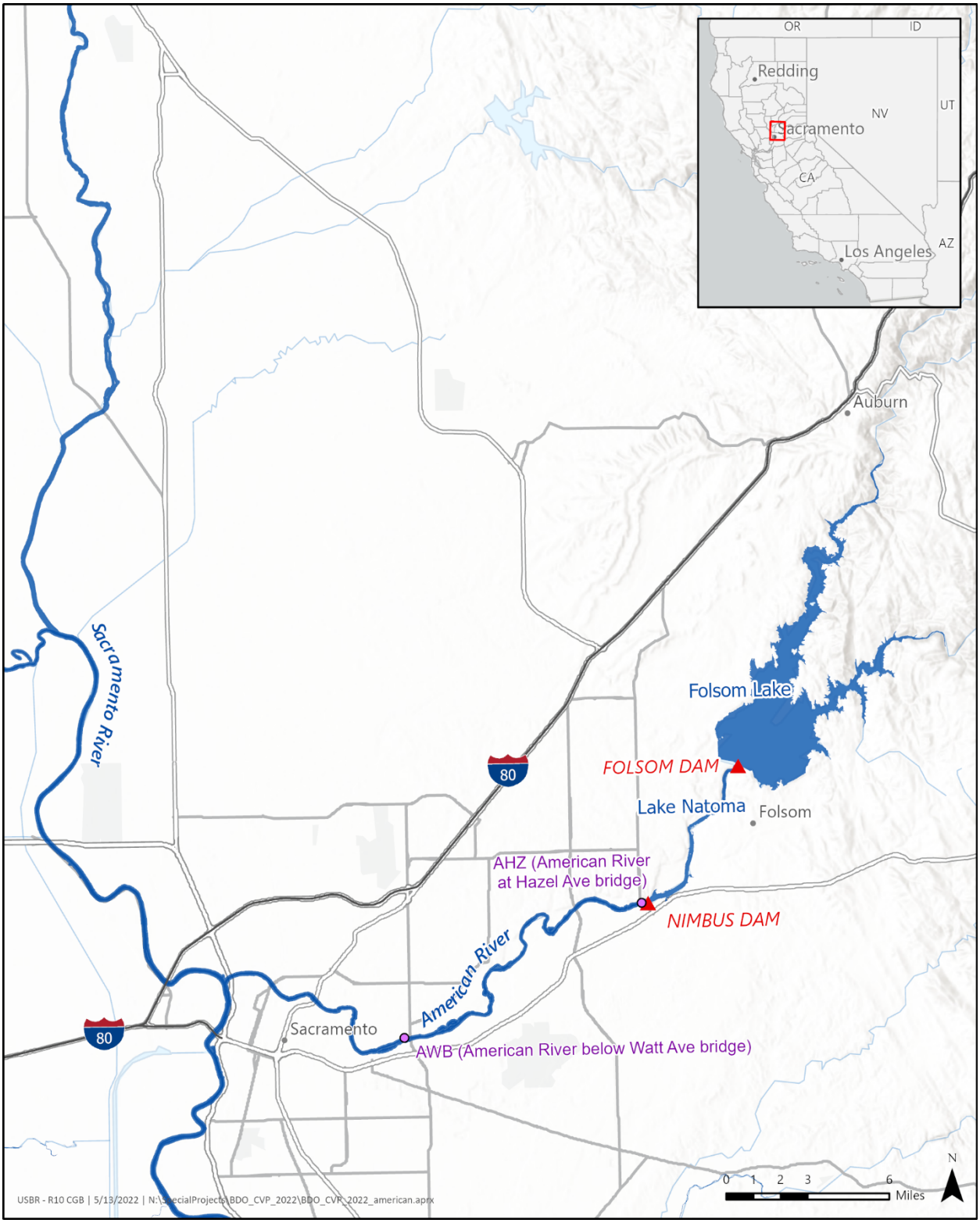

Figure 5. Facilities on the American River in the American River Division

Reclamation operates Folsom Reservoir in the winter primarily for flood control and minimum flows in the American River and Delta. Flood control may drive operations in wetter years. The

USACE 2019 *Water Control Manual: Folsom Dam and Lake* provides operational rules for dam safety and flood risk management. Flood operation criteria target flow rates below downstream channel capacities. During non-flood control operations, Reclamation stores Folsom Reservoir inflows that exceed releases for minimum instream flows and Delta water quality requirements. Reclamation seeks consistent steady releases to minimize potential redd dewatering, redd scouring, and juvenile stranding for steelhead and fall-run Chinook salmon, but Delta outflow requirements may require varying releases.

In the spring, when not operating to flood control requirements, Reclamation seeks to maximize capture of the spring runoff to fill as close to full as possible. Reclamation also operates for water supply and Delta outflow requirements. As the closest reservoir to the Delta, increased releases from Folsom are frequently called on to address Delta water quality requirements under State Water Board D-1641. When releases from upstream CVP and SWP reservoirs meet Delta outflow requirements, Folsom releases can be reduced, and system-wide reservoirs balanced.

Reclamation is implementing a pilot program that considers an end-of-December planning minimum of 300 TAF (Water Forum MOU, March 2021). When developing the operational forecast, Reclamation would evaluate an end-of-December Folsom storage of at least 300 TAF. In some years, operational constraints may result in an end-of-December storage of less than 300 TAF. If, based on the May forecast, Reclamation does not anticipate meeting 300 TAF at the end of December, Reclamation and the American River Parties develop a list of potential actions that may be taken to either improve forecasted storage or decrease demand on Folsom Reservoir. The objective of considering storage in the forecasting process is to provide releases of salmonid-suitable temperatures to the Lower American River and reliable deliveries to American River water agencies dependent on deliveries or releases from Folsom Reservoir. In September, storage is typically at its lowest after releases and diversions for summer demands. When planning in the spring for temperature management later in the year, meteorological forecasts of precipitation events are uncertain for October through December. Assuming higher precipitation events than may materialize may present a higher risk of the reservoir not having sufficient carryover storage by the end of December.

In the summer, Reclamation typically releases flows above the minimum instream flow requirements for instream temperature control, Delta outflow, and water supply. Reclamation manages water temperatures through the volume of water released and shutter elevations, in consideration of projected meteorological conditions. Reclamation balances the need to access Folsom Reservoir coldwater pool for instream temperature control during the summer for steelhead and the need to preserve cold water for fall-run Chinook salmon.

In the fall, operations focus on temperature management. Limited coldwater pool and limited storage require balancing releases and shutter operations to maximize the ability to maintain suitable temperatures for steelhead rearing and fall-run Chinook salmon spawning. If reservoir inflows are greater than the release needs, Reclamation stores the surplus water. Reclamation ramps down to the revised minimum flows from Folsom Reservoir as soon as possible in the fall and maintain these flows through fall-run Chinook salmon spawning, egg incubation, and fry emergence, where possible, to minimize redd dewatering and juvenile stranding.

4.2 Ramping Rates

Ramping rates address the stranding stressor. Reclamation would ramp down releases in the American River below Nimbus Dam, as shown in Table 4, and at night, if possible.

Table 4. American River Ramping Rates

Lower American River Daily Rate of Change (cfs)	Amount of Decrease in 24 Hours (cfs)	Maximum Change per Step (cfs)
20,000 to 16,000	4,000	1,350
16,000 to 13,000	3,000	1,000
13,000 to 11,000	2,000	700
11,000 to 9,500	1,500	500
9,500 to 8,300	1,200	400
8,300 to 7,300	1,000	350
7,300 to 6,400	900	300
6,400 to 5,650	750	250
5,650 to 5,000	650	250
<5,000	500	100

cfs = cubic feet per second.

Reclamation may vary from these ramping requirements during flood control. Reclamation, through Governance, may develop a faster down ramping rate on a case-by-case basis to implement temporary flow reductions for critical monitoring or maintenance needs.

4.3 Minimum Instream Flows (Minimum Release Requirements)

Minimum release requirements address redd dewatering, adult stranding and juvenile habitat stressors. For lower American River flows (below Nimbus Dam), Reclamation would adopt the American River Modified Flow Management Standard (ARMFS), developed by the Water Forum in 2017 (2017 MFMS) with modifications described in Appendix S. The ARMFS includes minimum release requirements (MRRs) ranging from 500 to 2,000 cfs based on time of year and annual hydrology. Modifications include calculating MRR based on the 90% exceedance forecast for the relevant hydrologic index and removing the offramp and volume offset for spring pulse flows. The flow schedule is intended to provide suitable habitat conditions for steelhead and fall-run Chinook salmon.

4.4 Spring Pulse Flows

Spring pulse flow addresses stressors on outmigration cues to increase emigration rates and move juveniles downstream. Reclamation will implement a spring pulse in years that the MRR for March (based on the March forecast) is between 1,000 cfs and 1,500 cfs, as described in the ARMFS. The peak flow of the pulse flow would be three times the March MRR, up to 4,000 cfs and lasting two days. Following two days at the peak flow, Nimbus releases would decrease consistent with Ramping Rates. Reclamation would develop a pulse flow schedule through Governance.

4.5 Redd Dewatering Protective Adjustments

The Redd Dewatering Protective Adjustment (RDPA), as described in ARMFS, adjusts the MRR to account for hydrology and potential dewatering impacts to fall-run Chinook salmon redds in January and February; and steelhead redds February through May. Dewatering Protective Adjustments based on the MRR are not protective when actual flows in-river are above the MRR. Releases can be above the MRR in the fall and winter due to contractual obligations, Delta water quality objectives, and precipitation events. There are not Redd Dewatering Protective Adjustments based on actual flows.

In January, the MRR can only decrease and cannot be less than 70% of the December MRR. In February, the MRR cannot be less than 70% of the December MRR. Table 5 shows the minimum flow for steelhead redds through May based on the January MRR. If the February MRR is higher than January, the February MRR is used through May.

Table 5. Steelhead Redd Dewatering Protective Adjustment-Based MRR for February through May[1]

January or February MRR (cfs)	Steelhead Redd MRR through May (cfs)
≤700	500
800	520
900	580
1,000	640
1,100	710
1,200	780
1,300	840
1,400	950
1,500	1,030
1,600	1,100
1,700	1,180
1,800	1,250

[1] The maximum MRR in January through May is 1,750 cfs, but 1,800 cfs is included in the table as a maximum value.
cfs= cubic feet per second; MMR = minimum release requirement.

In February, the American River Index (ARI)-based and fall-run Chinook salmon RDPA-based MRRs for February are compared to the steelhead RDPA-based MRR in Table 5, using the controlling MRR in January as a basis. The highest of the three MRRs controls operations.

For March through May, the ARI-based MRR for the month is compared to the steelhead RDPA-based MRR in Table 5, using the highest of the controlling MRRs in January or February as a basis. The highest of the two MRRs controls operations.

4.6 Water Temperature Management

Temperature management supports fall-run and addresses the water temperature stressor on steelhead. Reclamation would implement the Automated Temperature Selection Procedure (ATSP) developed in consultation with representatives of state and federal agencies. Each ATSP schedule determines a monthly series of water temperature targets (for daily average water temperature) at the Watt Avenue bridge. Schedule 1 has a water temperature upper limit of 63°F from May through September, and 56°F in October and November. Schedule 78 has a water temperature upper limit of 72°F from May through November. Schedules 2 through 77 each represent a change in a single month's upper temperature limit by 1°F.

Reclamation, through Governance, may modify the ATSP or utilize another method based on year-type conditions. In years when the lower American River will have temperatures unsuitable

for rearing or spawning, Reclamation, through Governance, will evaluate actions that can be taken to minimize temperature impacts to fisheries and may modify the ATSP as follows:

- For Schedule 28 or higher (greater than 65°F at Watt Avenue Bridge, May through September), the TMP may consider a temperature location at Hazel Avenue

- For greater than 65°F at Hazel Avenue bridge for May through September, the TMP will include an evaluation of whether modified Folsom operations could support an improved temperature schedule (e.g., an alternate release schedule over the summer)

- For greater than 68°F at Hazel Avenue for May through September, the TMP will include an evaluation of whether modified Folsom operations could support an improved temperature schedule (e.g., an alternate release schedule over the summer) and evaluate a power bypass during the summer and/or fall

- For greater than 56°F at Hazel Avenue in November, the TMP will evaluate a power bypass in the fall, with the evaluation likely to occur in August and September

Reclamation, through Governance, will annually prepare a TMP by June 15 for shutter configurations to attain the best possible (lowest numbered) temperature schedule. The priority for use of the lowest water temperature control shutters at Folsom Dam will achieve the water temperature requirement for steelhead and may also be used to provide cold water for fall-fun spawning. The TMP will contain: (1) forecasts of hydrology and storage; and (2) a modeling run or runs, using these forecasts, demonstrating what temperature compliance schedule can be attained. During plan implementation, if daily temperature is exceeded for three consecutive days, or is exceeded by more than 3°F for a single day, Reclamation, will notify NMFS through Governance and outline steps to realign water temperature with the TMP.

The most suitable water temperature for juvenile steelhead rearing habitat in the lower American River is 65°F or lower. Ideally, the TMP would provide for daily average water temperatures no higher than 65°F from Nimbus Dam (just upstream of the Hazel Avenue bridge) down to the Watt Avenue bridge. The active temperature management season is approximately May 15 to October 31. Of additional importance, water temperatures below 56°F are suitable for fall-run Chinook salmon spawning add egg incubation. Carcass surveys in the lower American River indicate spawning from approximately mid-October through December and into January. The ATSP prioritizes water temperatures during the summer to support steelhead rearing over water temperatures in the fall to support Chinook salmon spawning.

5. Delta

Reclamation operates and maintains the Delta Division of the CVP for M&I and agricultural water supplies, hydroelectric power generation, fish and wildlife protection, recreation, and Delta water quality objectives. The major CVP features are the Delta Cross Channel, Contra Costa Canal and Rock Slough Intake facilities, Tracy Fish Collection Facility and C. W. "Bill" Jones Pumping Plant (Jones Pumping Plant), and Delta-Mendota Canal (Figure 6). The Jones Pumping Plant, located about five miles north of Tracy, has six fixed-speed pumps with an operating capacity of 4,600 cfs. The Jones Pumping Plant discharges into the head of the Delta-Mendota Canal.

Reclamation operates and maintains the San Luis Unit of the West San Joaquin Division for M&I and agricultural water supplies, hydroelectric power generation, fish and wildlife protection, recreation, and water quality. The major joint CVP and SWP features are the O'Neill Forebay, San Luis Reservoir, Bernice Frederic Sisk Dam, O'Neill Pumping-Generating Plant, William R. Gianelli Pumping-Generating Plant, San Luis Canal, Dos Amigos Pumping Plant, and Los Banos and Little Panoche Detention Dams and Reservoirs. The major CVP-only facilities include the Coalinga Canal and Pleasant Valley Pumping Plant.

Reclamation operates the San Felipe Division for M&I and agricultural water supplies, fish and wildlife protection, and recreation. The major CVP features are the Pacheco Pumping Plant, Tunnel, and Conduit.

The main SWP Delta features are the Barker Slough Pumping Plant, Suisun Marsh facilities (including the Suisun Marsh Salinity Control Gate, Roaring River Distribution System, Morrow Island Distribution System, Goodyear Slough Outfall Gates), Clifton Court Forebay, and John E. Skinner Delta Fish Protective Facility (Skinner Fish Facility), Harvey O. Banks Pumping Plant (Banks Pumping Plant) and a portion of the California Aqueduct. The Barker Slough Pumping Plant diverts water from Barker Slough into the North Bay Aqueduct for delivery to the Solano County Water Agency and the Napa County Flood Control and Water Conservation District. The Suisun Marsh Salinity Control Gates (SMSCG) are located on Montezuma Slough about two miles downstream from the confluence of the Sacramento and San Joaquin Rivers, near Collinsville. The purpose of SMSCG operation is to decrease the salinity of the water in the eastern portion of the Suisun Marsh. When operated tidally, the gates reduce salinity by restricting the flow of higher salinity water from Grizzly Bay into Montezuma Slough during incoming tides and by retaining lower salinity Sacramento River water from the previous ebb tide. Operation of the gates in this fashion lowers salinity in eastern Suisun Marsh channels and results in a net movement of water from east to west through Suisun Marsh.

The SWP Banks Pumping Plant, located near the Jones Pumping Plant, has 11 pumps. Pumping is limited to a maximum permitted capacity of 10,300 cfs. The Banks Pumping Plant discharges into the California Aqueduct. At a minimum, Reclamation and DWR pump 1,500 cfs to provide for health and safety.

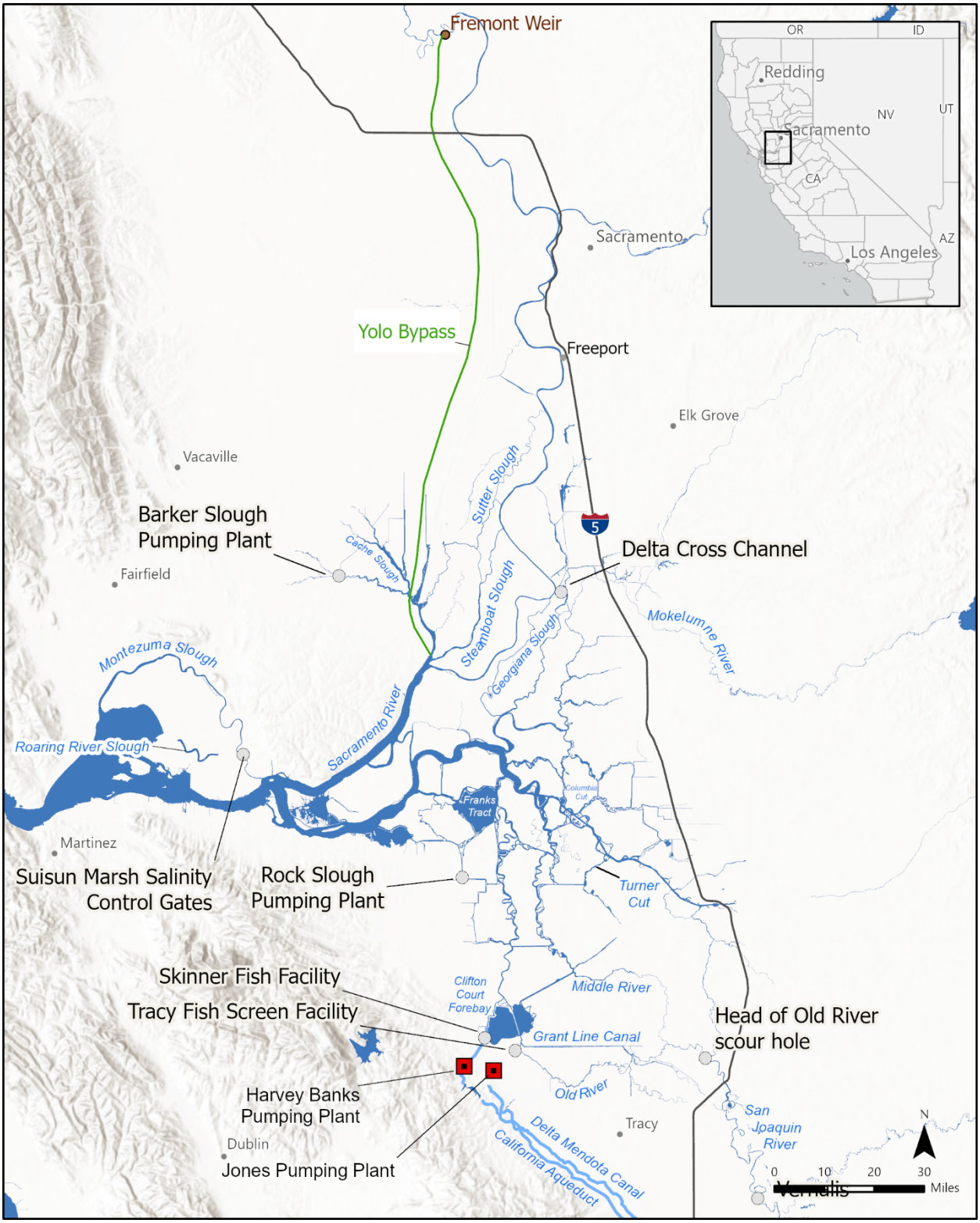

Figure 6. Facilities in the Sacramento-San Joaquin River Delta in the Delta Division

The Delta-Mendota Canal/California Aqueduct Intertie is used to move water between the California Aqueduct and the Delta-Mendota Canal and can pump up to 700 cfs from the Delta-

Mendota Canal to the California Aqueduct and convey up to 900 cfs from the California Aqueduct to the Delta-Mendota Canal. This structure was built to help both federal and state water projects more effectively move water from the Delta for south of Delta beneficial uses.

Statutory, Regulatory, and Contractual Requirements, see Appendix A:

- Public Law 74-392 CVP Re-Authorization Act
- State Water Board D-1641
- 1986 COA and 2018 COA amendment
- Public Law 99-546, Suisun Marsh Preservation Act
- 1986 Settlement Agreement with South Delta Water Agency (Clifton Court Forebay gate operations)
- October 13, 1981, USACE Public Notice #5820A (Clifton Court inflow criteria)
- DWR's Division of Safety of Dams criteria (Clifton Court Forebay storage)
- USACE permit number 199900715 (Clifton Court Forebay additional 500 cfs)
- DWR/CDFW Agreement (Skinner Fish Facility)
- USACE permit numbers SPK-200100121, SPK-20000696 (Temporary Barriers)

Programs in the environmental baseline to highlight:

- Agricultural Barrier Construction (USACE)
- Barker Slough Pumping Plant Fish Screen (DWR)
- Contra Costa Los Vaqueros Expansion – Phase 1
- Contra Costa Rock Slough Fish Screen
- Delta Cross Channel Gate Improvements Study
- Georgiana Slough Non-Physical Barrier (DWR, USACE)
- Head of Old River – Scour Hole Predation Reduction Study
- B.F. Sisk Dam Raise and Reservoir Expansion Project Construction
- Suisun Marsh Habitat Management, Preservation, and Restoration Plan
- Tracy Fish Collection Facility Improvement Program

- Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project
- Reclamation's Municipal and Industrial (M&I) Water Shortage Policy

5.1 Seasonal Operations

In the winter and spring, Reclamation and DWR typically export 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, Reclamation and DWR may need to increase releases from upstream reservoirs beyond what is needed to meet minimum flow requirements to meet Delta water quality objectives.

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 flow requirements, which may be available for export after Delta water quality objectives have been met.

In the fall, operations are adjusted to meet salinity requirements, Delta outflow requirements, and peak demands from 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 redds may occur and result in additional flows into the Delta.

The Banks Pumping Plant pumps water from Clifton Court Forebay. The Clifton Court Forebay 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 Clifton Court Forebay 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. From mid-December through mid-March, diversions into Clifton Court Forebay may be increased by one-third of the San Joaquin River flow at Vernalis when those flows exceed 1,000 cfs. Further, Banks Pumping Plant will pump up to 195,000 acre-feet for the CVP at times when those diversions do not adversely affect the SWP in accordance with COA.

5.2 Delta Cross Channel Gate Closures

Delta Cross Channel (DCC) gates closures address the stressors outmigration cues and entrainment risk for salmon and steelhead. Reclamation operates the DCC gates to improve the movement of water from the Sacramento River to the export facilities at the Jones and Banks Pumping Plants; improve water quality in the central and south Delta; reduce salinity intrusion rates in the west Delta; and allow passage for boaters. Reclamation closes the DCC gates during the late fall, winter, and spring to reduce straying of Mokelumne River fall-run Chinook salmon, protect out-migrating salmonids from entering the interior Delta, facilitate the State Water Board D-1641 Rio Vista flow objectives for fish passage, and reduce potential scouring and flooding that might occur in the channels on the downstream side of the gates when sustained Sacramento River flows exceed 20,000 cfs.

Reclamation would operate the DCC gates as follows:

- **October 1 – November 30, Catch Index Closure**: From October 1 through November 30, if water quality criteria for D-1641 are met, Reclamation would close the DCC gates to reduce juvenile salmonid entrainment risk. If the Knights Landing Catch Index or Sacramento Catch Index (catch index) ≥ three fish per day, Reclamation would close the DCC gates, within 48 hours, for at least 3 days and keep closed until the catch index is less than three fish per day at both the Knights Landing and Sacramento monitoring sites for two consecutive days.

  If real-time hydrodynamic and salinity modeling shows water quality concern level targets (Table 6) are likely to be exceeded during the 14- day period following DCC closure, Reclamation, through Governance, may complete risk assessment for an alternative DCC gate closure, e.g., weekday closure.

  Table 6. Water Quality Levels of Concern Criteria (Simulated 14-day average Electrical Conductivity)

Station	Water Quality Concern Level (µmhos/cm)
Jersey Point	1800
Bethel Island	1000
Holland Cut	800
Bacon Island	700

µmhos/cm = micromhos per centimeter.

  Observations of daily increases in catch indices are typically associated with increased flows at Wilkins Slough and tributaries to the upper Sacramento River, cooler water temperatures at these locations, and entry of migrating juvenile winter-run and spring-run Chinook salmon (Del Rosario et al. 2013, White and Low 2006).

- **October 1 – November 30, Lower Mokelumne River Fall Closure**: From October 1 through November 30, if water quality criteria per D-1641 are met, Reclamation may close the DCC gates to enhance adult fall-run Chinook salmon passage into the Mokelumne River for up to 5 days.

  Reclamation, through Governance, will coordinate the timing with East Bay Municipal Utility District releases of Lower Mokelumne River (LMR) attraction flows. Reclamation may adjust closures if real time hydrodynamic and salinity modeling shows water quality concern level targets (Table 6) may be exceeded or there is material deterioration of interior Delta water quality during the 14-day period following DCC closure.

  Closure of the DCC gates when adult fall-run Chinook salmon attraction flows pass through the LMR can reduce straying of Chinook salmon between the Mokelumne and American rivers and increase the abundance of fall-run Chinook salmon returning to the Mokelumne River and its hatchery.

- **December 1 – January 31**: From December 1 to January 31, Reclamation will close the DCC gates to reduce juvenile salmonid entrainment risk.

  If Reclamation and DWR are likely to exceed a D-1641 water quality criterion within the next 14 days based on water quality modeling, Reclamation, through Governance, may prepare an assessment to evaluate opening the DCC gates for up to five days to avoid D-1641 water quality criteria exceedance. During these potential DCC gates openings, the CVP and SWP would limit combined exports as not to exceed 1,500 cfs, Health and Safety pumping level.

  Closure of the Delta Cross Channel Gates is associated with increased routing of salmonids through the Sacramento River and increased survival of the Sacramento River migration route[3]

- **February 1 – May 20**: State Water Board D-1641 requires the Delta Cross Channel Gates be closed.

- **May 21 – June 15**: Reclamation would close the Delta Cross Channel Gates for a total of 14 days to reduce juvenile salmonid entrainment risk. Reclamation and DWR, through Governance, will prepare a plan that considers the distribution and abundance of fish within the Delta, survival estimates, and other relevant information. Reclamation typically schedules the Delta Cross Channel closures to occur on weekdays and keeps it open on weekends to accommodate recreational interests. State Water Board D-1641 requires the Delta Cross Channel to be closed for a total of 14 days after consultation with the USFWS, CDFW, and NMFS.

[3] Hace et al. (2022). From drought to deluge: spatiotemporal variation in migration routing, survival, travel time and floodplain use of an endangered migratory fish. Canadian Journal of Fisheries and Aquatic Science, 79:3. March. https://doi.org/10.1139/cjfas-2021-0042

- **June 16 – September 30**: From June 16 to September 30, Reclamation may open the DCC gate.

The Reclamation Designers Operating Criteria, dated September 24, 1971, requires Reclamation to undertake routine maintenance and repair of the DCC gates to continue reliable operation.[4] Certain routine maintenance and repair require cycling of the DCC gates (i.e., open and close the gates several times in a row). Routine maintenance and repair will require cycling of one or both gates approximately twice per year for one day each. To avoid and minimize effects, Reclamation to the extent practicable will:

- Perform cycling when federally listed fish are not likely present (mid-June through September)
- Perform cycling during daylight hours
- Minimize the duration of the time DCC gates is open during cycling when salmonids are present

Reclamation is required to maintain the DCC gates and may not have discretion over when the maintenance must occur. Reclamation would notify USFWS and NMFS of maintenance prior to its implementation, if it occurs during a closure period.

5.3 Entrainment Management

Entrainment management addresses the entrainment stressor on adult, larval and juvenile Delta smelt; adult, larval and juvenile longfin smelt; winter-run Chinook salmon juveniles, spring-run Chinook salmon juveniles, steelhead juveniles, and green sturgeon. During entrainment management, Reclamation and DWR would operate export facilities to an Old and Middle River Flow Index (OMRI) using the Hutton (2008) equation. OMRI provides a surrogate for how export pumping at Jones and Banks pumping plants influences hydrodynamics in the south Delta. The flow at Jersey Point (JPF) provides a surrogate for high flows that reduce the risk of entrainment regardless of OMRI. Reclamation and DWR would compute JPF based on San Joaquin River Inflow at Vernalis, Cosumnes River Inflow, Mokelumne River Inflow, Calaveras River Inflow, Flow from Sacramento River through DCC, Flow from Sacramento River through Georgiana Slough, 65% of in-Delta precipitation, -65% of in-Delta diversions, and -Export Pumping at (Banks + Jones) .

5.3.1 Start of Entrainment Management

Entrainment management starts when fish populations are in the Delta and likely to experience entrainment. Reclamation and DWR would operate to OMRI no more negative than -5,000 cfs until the end of entrainment management after one of the following conditions occur:

[4] Bureau of Reclamation. September 24, 1971. Reclamation Designers Operating Criteria.

- First Flush Conditions: From December 1 through the last day of February, Reclamation and DWR would reduce CVP and SWP exports once to maintain an average OMRI no more negative than -2,000 cfs for 14 days when:
    - Three-day running average of daily flow 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).
- Longfin Smelt Adult: After December 1, if cumulative water year salvage of age 1+ Longfin smelt exceeds 5% of the fall mid water trawl index plus one fish.
- Winter-Run Chinook Salmon: After January 1, when the first winter-run Chinook salvage occurs (hatchery winter-run Chinook salmon or genetically verified wild winter-run Chinook salmon).

Reclamation, through Governance, 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 conditions of First Flush are imminent (i.e., within two to three days) and/or increased entrainment of adult Delta smelt to the south Delta is likely (i.e., turbidity bridge). Reclamation, through Governance, may prepare an assessment to postpone the First Flush Action or reduce the magnitude or duration if real-time monitoring of abiotic and biotic factors and salvage prediction models indicate the First Flush Action is not warranted to avoid exceeding incidental take of listed species.

A First Flush Action reduces the rapid upstream migration of adult Delta smelt into the south Delta where they may be subject to an increased risk of subsequent entrainment into export facilities and their progeny may experience poor habitat conditions. The onset of winter adult Delta smelt entrainment often coincides with the first accumulation of turbid waters, which are typically correlated with elevated Freeport flows (Grimaldo et al. 2009, Grimaldo et al. 2021). An OMR no more negative than -2,000 cfs approximates hydrodynamics where the zone of influence of exports on turbidity remains outside the central Delta and a 14-day period duration causes this hydrodynamic change to occur for the approximate period of a spring-neap tide. After the initial upstream migration, Delta smelt are thought to shelter in proximity of spawning habitats (Polansky et al 2018, Sommer et al 2011).

Adult longfin smelt have limited historical presence in the South Delta (Merz et al. 2013, their Figure 4) and are observed at CVP/SWP fish collection facilities as early as December with a peak in January. Historically, cumulative salvage was lower when operating to an OMRI less negative than -5,000 and further decreased after smaller population abundances were observed after the Pelagic Organism Decline (TBI 2007, their Figure 13; Smith et al 2019). No model exists to evaluate appropriate thresholds for adult entrainment impacts of the longfin smelt population, thus entrainment management for longfin smelt is initiated if greater than 5% of the population abundance estimate (e.g., index, other method) has been salvaged.

The winter-run Chinook salmon population has limited historical presence in the South Delta. Salvage has been observed as early as December, but more typically in January, with a peak in March once an OMRI less negative than -5,000 cfs starts. No model is available to evaluate appropriate threshold for juvenile entrainment impacts on the winter-run Chinook salmon population, thus entrainment management for winter-run Chinook salmon is initiated once the first genetically identified winter-run Chinook salmon is found at the CVP or SWP fish collection facilities.

5.3.2 Real-Time Assessment Thresholds

Reclamation and DWR may operate to a more restrictive OMRI to further manage entrainment under the following thresholds:

- **Longfin Smelt Adults**: If JPF is < 0 cfs, an assessment indicates annual loss is on a trajectory to exceed 5% of the adult population abundance, and reduced exports will reduce entrainment into the South Delta, Reclamation and DWR would reduce CVP and SWP exports to maintain an average OMRI no more negative than -3,500 cfs for at least 7 days and prepare a subsequent assessment.

- **Longfin Smelt Larvae and Juveniles**: If JPF is < 0 cfs and a population model demonstrates a need to reduce entrainment to avoid population decline, Reclamation and DWR would reduce average OMRI no more negative than -3,500 cfs for at least 7 days and prepare a subsequent assessment.

- **Delta Smelt Adults**: If JPF is < 0 cfs, daily average turbidity is ≥ 12 FNU in the OMR corridor, and average water temperatures at Jersey Point or Rio Vista have not exceeded 53.6ºF (12ºC) consecutively for 3 days, Reclamation and DWR would make a one-time action to reduce reducing CVP and SWP exports to maintain an average OMRI no more negative than -3,500 cfs for at least 7 days.

- **Delta Smelt Larvae and Juveniles**: After the onset of spawning, if JPF is < 0 cfs, turbidity is ≥ 12 FNU in the south Delta, and Particle Tracking Model (PTM) modeling indicates that the action would avoid ≥ 5% entrainment of the Delta smelt population at facilities after 30 days, Reclamation and DWR would reduce CVP and SWP exports to maintain an average OMRI no more negative than -3,500 cfs for at least seven days and prepare a subsequent assessment.

- **Winter-Run Chinook Salmon Juveniles**: If an assessment indicates annual salvage loss is on a trajectory to exceed 1% of the Juvenile Production Estimate (JPE) entering the Delta and a reduction in export pumping would materially increase through-Delta survival, Reclamation and DWR will reduce CVP and SWP exports to maintain an average OMRI no more negative than -3,500 cfs for at least seven days and prepare a subsequent assessment.

  The annual salvage loss as a proportion of the winter-run Chinook salmon JPE shall be separately tracked by:

  - Genetically confirmed unclipped winter-run Chinook salmon; and

- Releases from Livingston Stone National Fish Hatchery.

If a Chinook salmon cannot be genotyped, it shall be identified based on Length-At-Date.

- **Spring-Run Chinook Salmon Juveniles**: If an assessment indicates annual salvage loss is on a trajectory to exceed 1% of the JPE entering the Delta and a reduction in export pumping would materially increase through-Delta survival, Reclamation and DWR will reduce CVP and SWP exports to maintain an average OMRI no more negative than -3,500 cfs for seven days and prepare a subsequent assessment.

  The annual salvage loss as a proportion of the spring-run Chinook salmon JPE shall be tracked by surrogates:

  1. Yearling: Coleman Late-Fall Chinook Production Release

  2. Young of Year: Feather River Hatchery Spring-Run Production Releases

- **Steelhead Juveniles**: If an assessment indicates annual loss is on a trajectory to exceed 1% of the JPE entering the Delta and a reduction in export pumping would materially increase through-Delta survival, Reclamation and DWR will reduce CVP and SWP exports to maintain an average OMRI no more negative than -3,500 cfs for seven days and a subsequent assessment.

  The annual salvage loss as a proportion of the steelhead JPE shall be estimated by the tracked by surrogates of hatchery steelhead released as part of normal hatchery practices.

  1. Sacramento River Origin: Coleman, Nimbus, and Feather River hatcheries Production Releases

  2. San Joaquin Origin: Mokelumne River Hatchery Production Releases

The JPE for each release group of salmonids entering the Delta shall be determined by the historical average survival from release sites to Delta entry, or when available, by observed survival to Delta entry provided by real-time acoustic receiver arrays. Reclamation and DWR, through Governance, may modify survival estimates based on year-specific conditions.

Reclamation, through Governance, would prepare assessments at least weekly. Assessments would track salvage loss, including loss of species that do not trigger additional actions, and evaluate scenarios of OMRI no more negative than -5,000 cfs and -3,500 cfs for estimates of trajectories and through-Delta survival. Assessments would consider the source of turbidity and how that may change the survival and recruitment of species.

When JPF are greater than zero, Delta hydrodynamics reflect conditions unfavorable for entrainment of adult, larval, and juvenile Longfin smelt into the South Delta. In addition to negative values of JPF, observations of proportional population loss should demonstrate potential impacts. No model exists to evaluate appropriate thresholds for adult longfin smelt entrainment impacts, thus entrainment reduction action for longfin smelt occurs when the loss trajectory is likely to exceed 5% of the adult population abundance. No model exists to evaluate appropriate

thresholds for larval/juvenile entrainment impacts of the longfin smelt population, thus entrainment reduction action for longfin smelt will be appropriate scaled when a population model demonstrates a need to reduce entrainment to avoid population decline

When JPF are greater than zero, Delta hydrodynamics reflect net flow conditions unfavorable for entrainment of adult, larval, and juvenile Delta smelt into the South Delta. Survival and migration of adults are already in the South Delta is influenced by turbidity; and when turbidity is high, reducing OMR negative flows can reduce entrainment of larval and juvenile Delta smelt (Smith et al 2021). This entrainment reduction action for adult Delta smelt is in place until 53.6ºF (12ºC) occurs for three days, which are temperatures indicative of spawning (Damon et al 2016). This entrainment reduction action for larval and juvenile Delta smelt occurs when the additional condition of PTM modeling demonstrating more than 5% of particles injected in the Central Delta being entrained at the facilities, which is indicative of South Delta hydrodynamic alteration due to exports.

Delta juvenile salmonid survival in driven by inflows and temperatures (Hance et al. 2021, Nobriga et al 2021, Wang et al 2024), and the role of exports on through-Delta survival may reflect a compensatory or additive mortality source for these populations. No model is available to evaluate appropriate thresholds for juvenile entrainment impacts of winter-run and spring-run Chinook salmon and Central Valley steelhead population, thus entrainment management for these species is initiated if an assessment indicates the trajectory is that greater than 1% of the JPE entering the Delta will be lost and a reduction will increase through-Delta survival.

5.3.3 Stormflex

From the start of OMRI management season until the larval and juvenile Delta Smelt Protection Action is triggered, Reclamation and DWR may operate to OMRI no more negative than -6,500 cfs to capture peak flows during storm-related events when:

- A measurable precipitation event has occurred in the Central Valley;
- Reclamation and DWR determine that the net Delta outflow index indicates a higher level of outflow available for diversion due to peak storm flows;
- The Delta is in excess conditions as defined in COA;
- JPF is greater than +1,500 cfs; AND
- A real-time assessment threshold is unlikely to be exceeded.

Reclamation and DWR would use the assessment process to evaluate stormflex by including an additional OMR scenario up to -6,500 cfs OMRI. If the assessment indicates that no real-time thresholds for the upcoming week are likely to be exceeded, Reclamation and DWR may operate to the more negative OMR and will update the assessment no less than weekly.

5.3.4 End of Entrainment Management

Entrainment management ends when water temperatures in the Delta no longer provide hospitable conditions indicative of listed fish presence.

- Smelts: June 30 or after 3 consecutive days of daily mean water temperature at Clifton Court Forebay (CLC) ≥ 77.0°F (25°C).

- Salmonids: June 30 or after 7 days of daily mean water temperature in June ≥ 72°F (22.2°C) at Mossdale and at Prisoner's Point (does not have to be consecutive).

Inhospitable south Delta and San Joaquin River conditions reflect temperature known to be lethal for Delta smelt and salmonids. For salmonids, water temperature above the 75.2°F reflect the upper incipient lethal temperature (UILT) for juveniles (Brett 1952, Brett et al. 1982, Myrick and Cech 2004). For Delta smelt, their critical thermal maximum is 77°F and low abundance has been noted at this temperature (Swanson et al 2000, Nobriga et al. 2008).

5.4 Barker Slough Pumping Plant Maximum Spring Diversions

Barker Slough Pumping Plant (BSPP) maximum spring diversions addresses the entrainment risk and transport direction stressor for longfin smelt and Delta smelt. Cumulative BSPP diversions for the January 1 to March 31 period, at design capacity, are limited to approximately 26 TAF. Cumulative Barker Slough Pumping Plant diversions for the March to June period, at design capacity, is 42 TAF.

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

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

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

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

Fish screen cleaning, sediment removal, and aquatic weed removal at the Barker Slough Pumping Plant is needed year-round to maintain operation of the Barker Slough Pumping Plant. Raising and cleaning of the fish screens is necessary to prevent excessive head loss and minimize localized approach velocities. Attachment W provides the operating manual and details for Barker Slough Pumping Plant maintenance, including best management practices to minimize adverse effects on listed species. If updates are required to the best management practices and alternatives are sufficiently independent of operations, Reclamation and DWR will consult separately on maintenance and no longer include maintenance under the long-term operation of the CVP and SWP.

5.5 Tracy Fish Collection Facility

The Tracy Fish Collection Facility addresses the entrainment stressor. Reclamation would operate the Tracy Fish Collection Facility to screen fish from Jones Pumping Plant. The primary channel is a behavioral barrier with effectiveness that depends on the size and species of fish and the pumping rate at Jones Pumping Plant. The secondary channel includes a positive barrier fish screen. When south Delta hydraulic conditions allow and conditions are within the original design criteria for the Tracy Fish Collection Facility, the secondary channel is operated to achieve water approach velocities for striped bass of approximately one to 2.5 feet per second from June 1 through October 31 and for salmon of approximately three feet per second from November 1 through May 31.

Salvage of fish at the Tracy Fish Collection Facility occurs 24 hours per day, 365 days per year. 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 California Data Exchange Center stations is met. Salvage and operations data necessary to calculate loss are made available daily by 10 a.m. Pacific Standard Time (PST). The standard operating procedures for the Tracy Fish Collection Facility are included in Attachment T.

Reclamation is required to maintain the Tracy Fish Collection Facility and may not have discretion over when the maintenance must occur. Reclamation will provide the fish agencies notification of salvage disruption (salvage outage) due to planned facility maintenance at least 24 hours in advance. To minimize and avoid salvage disruptions, Reclamation conducts most planned outages during shutdowns of Jones Pumping Plant, typically in the spring and continuing into the summer and fall months. For unplanned facility maintenance, Reclamation will provide notice as soon as practicable and minimize the duration of the salvage outage. Reclamation, through technical assistance with the fishery agencies, will develop an appropriate loss factor for these outages.

5.6 John E. Skinner Delta Fish Protective Facility

The Skinner Delta Fish Protective Facility addresses the entrainment stressor. DWR would operate the facility to screen fish from 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 California Data Exchange Center stations is met. Salvage and operations data necessary to calculate loss are made available daily by 10 a.m. PST. The standard operation procedures for the Skinner Fish Facility are included as Appendix U.

DWR would 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 Clifton Court Forebay radial gates.

Aquatic weed management within Clifton Court Forebay 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 the Clifton Court Forebay. 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 the Clifton Court Forebay. The March 2023 Clifton Court Forebay Aquatic Weed Management Standard Operating Procedures provides the operations manual and details for Clifton Court Forebay Weed Management, including best management practices to minimize adverse effects on listed species. If updates are required to the Standard Operating Procedures and maintenance alternatives are sufficiently independent of operations, Reclamation and DWR will consult separately on maintenance and no longer include this action under the long-term operation of the CVP and SWP.

5.7 Agricultural Barriers

Agricultural barriers maintain water levels for south Delta agricultural diverters. DWR has renewed permits from the USACE for the installation of three agricultural barriers in the south Delta for 2023-2027. 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 would allow the barriers to operate 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 is not a concern and the mean daily water temperature at Mossdale is less than 71.6°F (22°C).

5.8 Water Transfers

Water transfers assist California urban areas, agricultural water users, and others in meeting their water needs. Reclamation and DWR would operate the CVP and SWP 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.

Seasonal operations describe deliveries up to contract totals. Included in this consultation are transfers of water, up to contract totals, between CVP contractors within counties, watersheds, or other areas of origin (e.g., Accelerated Water Transfers). These transfers do not require demonstration of that water being consumptively used or irretrievably lost to beneficial use.

Transfers not meeting these requirements, including Out of Basin transfers (e.g., North to South-of-Delta Transfers, San Joaquin River Exchange Contractor Transfers, "Warren Act Transfers"), follow the *Draft Technical Information for Preparing Water Transfer Proposals, as updated in 2019* (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 NEPA compliance and ESA section 7 consultations (see Programs in the Environmental Baseline for additional information), and are not part of this action. However, the specific timing and operations associated with the movement of the water to be transferred is a component of the LTO. Updated in 2019, the paper provides detailed information on establishing transfers and how to complete a particular transfer and document it in a way to prevent harm to other legal users of water. The following is a brief summary from the Water Transfers White Paper on making water available for transfer:

- **Cropland Idling/Crop Shifting Transfers:** Water from idling cropland or growing lower-water-use crops. The seller reduces surface water diversion from their normal operations.

- **Groundwater Substitution Transfers:** Water from reducing surface water diversions and replacing that like amount of water with groundwater pumping.

- **Reservoir Storage Release:** Water from seller releasing stored water from their reservoir in excess of what would be released annually under their normal operations (e.g., reservoir storage targets, historical operation patterns, instream flow requirement, conveyance losses, refill, and other downstream obligations).

Reclamation and DWR would provide a transfer window across the Delta from July 1 through November 30. When pumping capacity is needed for CVP or SWP water, Reclamation and DWR may restrict transfers. Maximum transfers are shown in Table 7.

Table 7. Proposed Annual North to South (out of basin) Water Transfer Volume

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

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 action to reduce the consumptive use of water or release additional water from reservoir storage (i.e., Water Transfers White Paper). This water is then conveyed to the buyers' service area for beneficial use.

Programs to make transfer water available not included in this consultation include:

- Long Term Water Transfer Program (North to South-of-Delta Transfers)
- Long Term San Joaquin River Exchange Contractor Transfers
- Non-Project Transfers, e.g., "Warren Act Transfers"

Reclamation and DWR 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.

5.9 Spring Delta Outflow

Reclamation and DWR would take actions intended to supplement Delta outflow per the terms of the VAs. Actions that will support the additional Delta outflow include the following: Reclamation and DWR south of Delta export modifications; Reclamation reoperating upstream reservoirs to advance and allow for scheduling of water made available by contractors in CVP watersheds; and passing Delta inflow from water made available by VA Parties. Actions to result in increased Delta outflow are shown in Table 8. These volumes (and associated footnotes) are reflected in the Memorandum of Understanding signed by VA parties in March 2022.

Table 8. Water Made Available by the CVP and SWP[1]

Actions Resulting in Increased Delta Outflows	Critical (TAF)	Dry (TAF)	Below Normal (TAF)	Above Normal (TAF)	Wet (TAF)
SWP and CVP Forgone Exports[2]	0	125	125	175	0
SWP Flow Purchases Implemented through Forgone SWP exports	0	30	30	30	0
SRS Contractors Fallowing[3]	2	102	100	100	0
Sac. Valley Purchase[4]	0	10	10	10	0
American River Groundwater and Reoperation of Upstream Reservoirs[5]	30	40	10	10	0
CVP SOD Purchase[6]	0	12.5	24.5	35	0
Westlands Contract Assignment Purchase[7]	3	6	15	19.5	27
Additional CVP SOD[8]	0	5	5	5	0
San Joaquin River Flows above Tributary VAs	0	50	50	50	0
Flow Purchases Acquired Through SWP Diversion Fees (implemented through tributary inflow from the fallowing program)[9]	0	45	45	45	0
Total CVP and SWP Outflow Potentially through CVP and SWP Operations[10]	33	423.5	414.5	478.5	27
Additional Feather River Actions accounted for under Total VA Outflow (below)		60	60	60	
Total VA Outflow by All VA Parties	155	825.5	750.5	824.5	150

[1] These numbers are set forth in the Term Sheet, Appendix 1. Flow Tables

[2] Subject to Public Health and Safety exports of 1,500 cfs.

[3] SRS Contractors will fallow 25,000 acres of rice which is credited with 110 TAF, which includes 10 TAF of fixed price purchase water. Dry year water may be held in Shasta for storage to improve temperature management in the current or future years. 2TAF in Critical and Dry years are contributions from Mill/Cow Creek.

[4] The new flow contributions from the Sacramento River Basin identified in this table, plus new flow contributions resulting from the below-referenced PWA Water Purchase Program, Permanent State Water Purchases, and PWA Fixed Price Water Purchase Program line items in Table 3-12, are not intended to result in idling more than 35,000 acres of rice land in the Sacramento River Basin.

[5] Contingent on public funding of groundwater substitution infrastructure to be completed by a subsequent year, and compensation of upstream surface storage releases on a per acre-foot basis. These flows are included in the Year 1 subtotal. Only implementable in 3 of 8 Dry or Critical years and 3 of 8 Above Normal or Below Normal years.

[6] Subject to CVP SOD Agricultural Allocation.

[7] Quantity of water made available will be based on the maximum or a portion of the entitlement under certain assignment contracts and only that which is allocated to CVP SOD Agriculture.

[8] If flows are not obtained through this source, the equivalent volume would be obtained at market price or otherwise obtained through other mechanisms.

[9] The VA's governance program will be used to determine the use of available funding to provide additional outflow in AN, BN, or W years. If DWR is called upon to provide the water by foregoing SWP exports, such call will be

handled through a separate agreement between DWR and its contractors. The numbers for "Flow Purchases Acquired Through SWP Diversion Fees (implemented through tributary inflow from the fallowing program)" are the SWP's partial contributions to the total values set forth in the Term Sheet, Appendix 1 under the PWA Water Purchase Program's fallowing contributions for AN, BN and D years.

[10] The volumes identified in this row represent the CVP and SWP contributions. Additional flows from other VA parties and Permanent State Water Purchases will increase Delta Outflow.

Reclamation and DWR would operate consistent with the VAs approved by the State Water Resources Control Board (SWRCB) and executed agreements by VA Parties.

5.10 Summer and Fall Suisun Marsh Salinity Control Gate Operation

To address effects on critical habitat for juvenile Delta smelt by increasing habitat and food access in Suisun Marsh and Grizzly Bay, DWR would operate the SMSCG between June 1 and October 31 to maximize the spatial and temporal extent of Delta smelt low salinity zone habitat in Suisun Marsh and Grizzly Bay as follows:

- In dry years following below normal years, operate SMSCG for 30 days to maximize the number of days Belden's Landing three-day salinity is ≤ 6 practical salinity units (psu).
- In dry years following wet or above normal years, below normal years, and above normal years, operate SMSCG for 60 days, to maximize the number of days that Belden's Landing three-day average salinity is ≤ 4 psu.

DWR and Reclamation, through Governance, 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.

5.11 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 U.C. Davis Fish Conservation and Culture Laboratory (FCCL) 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.

Reclamation and DWR, through Governance, 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 (U.S. Fish and Wildlife Service 2020). The USFWS and CDFW may update the Supplementation Strategy in coordination with Reclamation and DWR.

The Supplementation Strategy currently uses the FCCL. 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 Delta Smelt Conservation Facility Fish Technology Center (U.S. Fish and Wildlife Service 2018) is currently being revisited and further developed to a 35% design-level plan. Additional facilities would require a subsequent set of environmental compliance for their construction and eventual operation. Reclamation and DWR will collaborate with USFWS and CDFW for the additional development of this planning effort, incorporation into the Supplementation Strategy, 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.

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 FCCL's broodstock collection efforts. Results indicate that an annual release of 150,000–175,000 fish is needed to have a greater than 50% chance of meeting the collection target. Reclamation and DWR will support a minimum production of 125,000 fish by water year 2024, a minimum 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.

5.12 B.F. Sisk Dam Raise and Reservoir Expansion

Upon completion of construction, Reclamation and DWR would operate Delta facilities with an expanded San Luis Reservoir. The raising of Bernice Frederick Sisk Dam will increase reservoir storage capacity by 130 TAF. Reclamation and DWR completed a final EIS/Environmental Impact Report in September 2019 for the addition of shear keys and downstream stability berms to provide seismic stability for the embankment during a large earthquake and to raise the dam crest by 12 feet. Reclamation consulted with the USFWS on construction and signed a record of Decision in October 2023 for the B.F. Sisk Dam Raise and Reservoir Expansion Project EIR/SEIS. This Proposed Action consults on the operational effects from increased exports with an expanded San Luis Reservoir.

5.13 Suisun Marsh – Roaring River Distribution System Fall Flood-Up

This Proposed Action includes DWR's operation of the Suisun Marsh Facilities (SMSCG, Roaring River Distribution System (RRDS), Morrow Island Distribution System (MIDS) and Goodyear Slough Outfall (GYSO)) in accordance with the Suisun Marsh Preservation Agreement (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 Summer and Fall SMSCG Operation Action) will continue as necessary to meet D-1641 and SMPA standards.

The 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 feet/second (ft/sec) at the intake fish screen except for a 5-week contiguous period (5-week flood-up window) when 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 5-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 Action includes operation of the RRDS for a 5-week flood up period each year.

If Reclamation and DWR reinitiate the consultation on the SMP (i.e., *Biological Opinions on the Proposed Suisun Marsh Habitat Management, Preservation, and Restoration Plan and the Project-Level Actions in Solano County, California*), operations of the Suisun Marsh Facilities would be included in their entirety under those consultations and no longer under the long-term operation of the CVP and SWP Record of Decision (ROD).

6. Stanislaus River

Reclamation operates and maintains the Eastside Division of the CVP for flood control, M&I and agricultural water supplies, hydroelectric power generation, fish and wildlife protection, recreation, and water quality. Reclamation's facilities include the New Melones Dam, Reservoir (2.4 MAF capacity), and Powerplant (Figure 7).

The Tri-Dam Project, a partnership between the Oakdale Irrigation District and South San Joaquin Irrigation District, consists of Donnells and Beardsley Dams, located upstream of New Melones Reservoir on the middle fork Stanislaus River, and Tulloch Dam and Powerplant, located approximately six miles downstream of New Melones Dam on the mainstem Stanislaus River. Releases from Donnells and Beardsley Dams affect inflows to New Melones Reservoir. The main water diversion point on the Stanislaus River is Goodwin Dam, an impassable barrier for fish migration approximately two miles downstream of Tulloch Dam.

Statutory and Regulatory Requirements, see Appendix A:

- USACE Standard Operation and Maintenance Manual for the Lower San Joaquin River Levees Lower San Joaquin River and Tributaries Project, California (April 1959)
- Public Law 87-874 Flood Control Act of 1962
- USACE Standard Operation and Maintenance Manual for the Lower San Joaquin River Levees Lower San Joaquin River and Tributaries Project, California (April 1959)
- Minimum flow standards below Goodwin Dam: "Interim Instream Flows and Fishery Studies in the Stanislaus River Below New Melones Reservoir" (1987 Agreement between Reclamation and CDFG)
- Minimum Dissolved Oxygen standards: State Water Board D-1422
- State Water Board D-1641, D-1422, D-1616, Bay-Delta Plan flow objectives and subsequent assignment of responsibility
- 1992 CVPIA 3406(b)(2)
- Agreements and Contracts
- 1988 Agreement and Stipulation with Oakdale Irrigation District and South San Joaquin Irrigation District
- Water Service and Repayment Contracts
- Tri-Dam Agreement

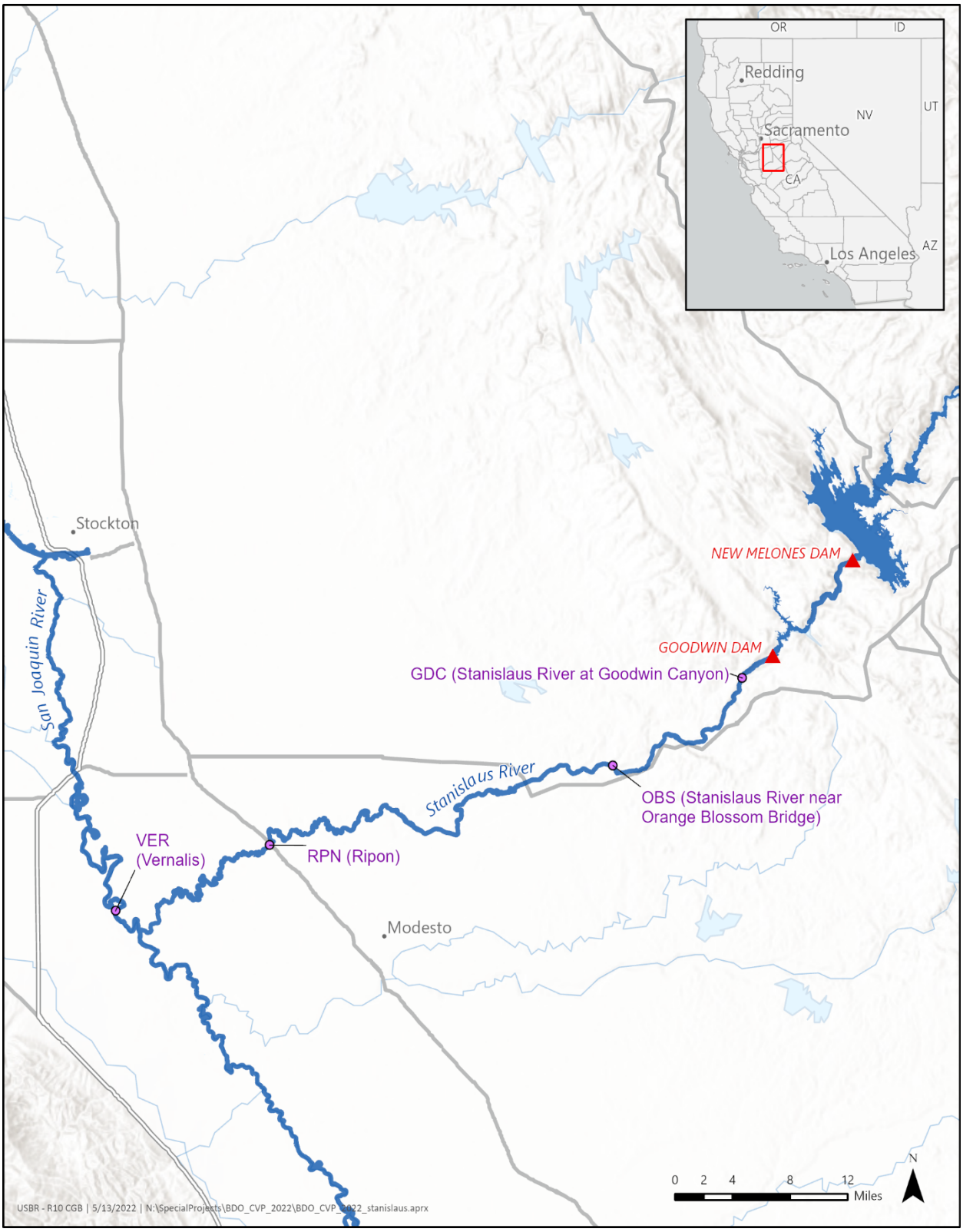

Figure 7. Facilities on the Stanislaus River in the Eastside Division

Programs in the environmental baseline to highlight:

- Spawning and Rearing Habitat Restoration
- Temperature Modeling Platform

6.1 Seasonal Operations

In the winter and spring, Reclamation will operate to D-1641 and for flood control in accordance with the USACE Standard Operation and Maintenance Manual for the Lower San Joaquin River Levees Lower San Joaquin River and Tributaries Project, California (April 1959). Operating to flood control constraints is relatively infrequent because New Melones is a larger reservoir relative to its annual inflow. However, Tulloch Lake is subject to high local inflows and may be in flood control operations for brief periods when New Melones Reservoir is not. During these periods, releases from Tulloch Lake may be used to meet flow objectives, schedules, or requirements on the lower Stanislaus River below Goodwin Dam but are generally of a short duration. Reclamation seeks to minimize potential redd dewatering, redd scouring, and juvenile stranding for steelhead.

Reclamation is required to maintain applicable dissolved oxygen standards on the lower Stanislaus River for species protection. The 7.0 milligrams per liter (mg/L) dissolved oxygen requirement at Ripon applies year-round but is most often controlling (requiring additional releases from Goodwin Dam) from June 1 to September 30.

In the fall, Reclamation operates to a D-1641 fall pulse flow requirement at Vernalis in October for fish attraction. Otherwise, Reclamation operates to minimum instream flow requirements in order to rebuild storage. If necessary, releases might be made for dissolved oxygen at Ripon or EC concerns at Vernalis, but these are rare.

6.2 Ramping Rates

Ramping rates address the stranding risk stressor. Reclamation would coordinate releases on the Stanislaus River as shown in Table 9.

Table 9. Goodwin Dam Ramping Rates

Goodwin Release Range (cfs)	Standard Rate of Increase (cfs per 2 hours)	Standard Rate of Decrease (cfs per 2 hours)	C and D Water Year Type Rate of Increase (cfs per 2 hours)	C and D Water Year Type Rate of Decrease (cfs per 2 hours)
At or above 4,500	250	250	250	250
2,000 to 4,499	500	250	500	250
500 to 1,999	250	100	500	200
300 to 499	100	50	200	100

cfs = cubic feet per second; C = critical (60-20-20 San Joaquin Index, 90% Forecast); D = dry (60-20-20 Index, 90%).

Reclamation may vary from these ramping requirements during flood control. Reclamation, through Governance, may develop a faster down ramping rate on a case-by-case basis to implement temporary flow reductions for critical monitoring or maintenance needs. Ramping rates that promote recruitment of native riparian vegetation on floodplain surfaces should be considered when instream flow budgets are sufficient.

6.3 Minimum Instream Flows

Minimum instream flows (i.e., Goodwin Dam releases) would be in accordance with the 2023 New Melones Stepped Release Plan (2023 SRP; Figure 8; Appendix N Attachment N (excel sheet). The 2023 SRP increases the potential outmigration response of juvenile steelhead and Chinook salmon and increases the annual total volume of water for all year types. Modifications would use a single pulse and increase peak releases from 400 cfs to 3,000 cfs in the default schedule.

For determining the water year type, Reclamation will use the San Joaquin Valley "60-20-20" Water Year Hydrologic Classification (60-20-20) developed for D-1641 implementation and based on a 90% exceedance forecast.

The 2023 SRP includes the ability to shape monthly and seasonal flow volumes as described below:

6.3.1 Winter Instability Flows

Winter instability flows address the outmigration and juvenile habitat stressors. Reclamation releases additional flow in February, as provided in the 2023 SRP, to simulate natural variability in the winter hydrograph and to enhance access to varied rearing habitats. Reclamation, through Governance, schedules the winter instability flow volume. Whenever possible the pulse is scheduled to coincide with a natural storm event, which may naturally cue outmigration. In some years, natural rain events may provide sufficient natural variability in the hydrograph and an additional pulse may be determined unnecessary. Ramping rates may be modified to provide

more flexibility for shaping flow volumes of water for the purposes of improving biological benefits during winter instability flows in critical and dry water year types.

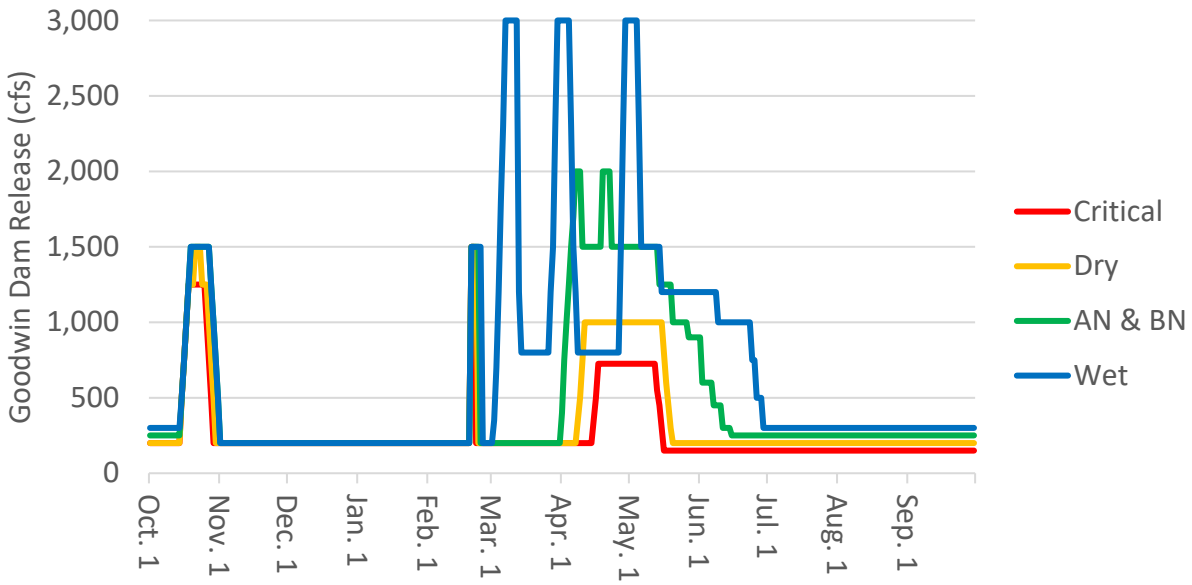

Figure 8. 2023 New Melones Stepped Release Plan with Modified Winter Instability Flows

6.3.2 Spring Pulse Flows

Spring pulse flows address the outmigration and juvenile habitat stressors. Reclamation would release additional flows starting as early as March through as late as June. Reclamation, through Governance, would schedule spring pulse flow volumes consistent with volumes in the Stepped Release Plan.

6.3.3 Fall Pulse Flows

Fall pulse flows improve instream conditions and provide an attraction cue for adult salmonids returning to spawn. Reclamation would release additional flows in October and/or November. Reclamation, through Governance, would schedule fall pulse flow volumes consistent with the volumes in the Stepped Release Plan and considering other system objectives.

7. San Joaquin River

Reclamation operates the Friant Division for flood control, M&I and agricultural water supplies, and fish and wildlife purposes. Friant Dam provides flood control on the San Joaquin River, downstream releases to meet senior water rights requirements above Gravelly Ford, Restoration Flows under Title X of Public Law 111-11, and diversions into the Madera and Friant-Kern Canals.

The Friant Division facilities include Friant Dam, Millerton Reservoir, and the Friant-Kern and Madera Canals (Figure 9). Water is delivered to about one million acres of agricultural land in Fresno, Kern, Madera, and Tulare Counties in the San Joaquin Valley via the Friant-Kern Canal south into Tulare Lake Basin and via the Madera Canal north to Madera and Chowchilla Irrigation Districts.

Statutory, Regulatory, and Contractual Requirements

- Public Law 74-392 CVP Re-Authorization Act
- Public Law 111-11 (San Joaquin River Restoration Settlement Act)
- State Water Board D-1641
- 1995 Bay-Delta Water Quality Control Plan
- USACE Public Notice 5820A Amended
- Friant Division Riparian Holding Contracts
- Friant Division Water Service and Repayment Contracts

Programs in the environmental baseline to highlight

- San Joaquin River Restoration Program

Reclamation would operate the Friant Division consistent with the San Joaquin River Restoration Program Record of Decision, which is a related action not included in this consultation.

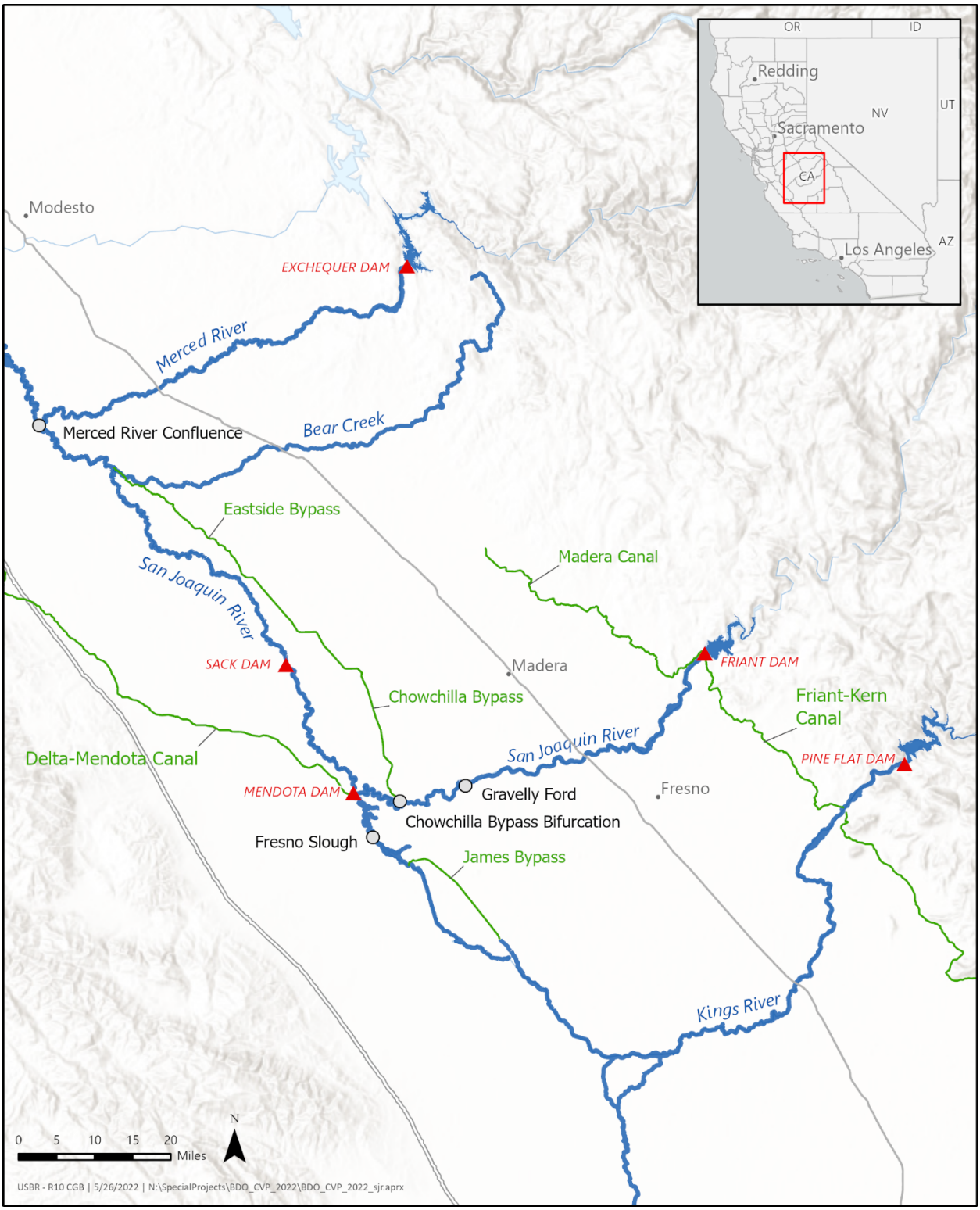

Figure 9. Facilities on the San Joaquin River in the Friant Division

8. Monitoring

Monitoring efforts to inform operational actions and effects of those actions currently occur under separate section 7 consultations and section 10(a)(1)(A) permits as described in *Chapter 2, Environmental Baseline*. Section 7 compliance and incidental take coverage would continue to be provided by the existing consultations and permits outlined in the environmental baseline section until Reclamation and DWR complete a subsequent consultation with USFWS and NMFS on changes to monitoring.

The Framework Programmatic consultation approach for monitoring includes the following principles which would be incorporated into any future changes to monitoring programs addressed in a subsequent consultation:

- Ensure monitoring will be beneficial to long-term operation of the CVP and SWP for:
    - minimizing effects on listed species and habitat (informing real-time operations, understanding species status, etc.)
    - understanding if various operational objectives are met (e.g., effectiveness and validation monitoring); and
    - 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 should effectively measure physical conditions, water quality, primary and secondary production; abundance, distribution, and production of ESA-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; and

- Provide for robust synthesis of monitoring data to incorporate results and lessons learned.

Monitoring of the LTO operations is subject to change over time by implementing these principles to improve monitoring where incorporating the best available scientific information indicates such change is appropriate. When Reclamation and DWR decide changes to a given monitoring program is necessary, Reclamation will provide the supporting information to USFWS and NMFS to support subsequent section 7 consultation as outlined in 50 CFR 402.14.

9. Storage and Conveyance Framework Programmatic

Reclamation and DWR include operation of the Sites Reservoir Project (Sites) and the operations of the proposed Delta Conveyance Project (DCP) in Action 5 as a programmatic action for section 7 consultation purposes, as defined in 50 CFR 402.02[5]. Reclamation has initiated consultation for the non-operational construction and maintenance components of Sites and USACE has initiated section 7 consultations for the non-operational construction and maintenance components of the DCP. Both consultations defer to the LTO to cover operation. The operation of Sites and DCP is expected to be authorized, funded, or carried out at a later time and will be subject to subsequent consultation. As Reclamation completes future consultations and makes decisions regarding each project, each of these actions will become part of the Environmental Baseline for Section 7 under the ESA and will be incorporated as a facility operated as part of the LTO.

9.1 Sites Reservoir Project

Sites is a proposed 1.5-million-acre-foot offstream surface water reservoir to provide direct and real benefits to instream flows, the Delta ecosystem, and water supply reliability, including for wildlife refuges. The reservoir inundation area would be in rural, unincorporated areas of Glenn and Colusa counties, and project components would be located in Tehama, Glenn, Colusa, and Yolo counties. Construction of Sites is expected to take approximately seven years, beginning in 2026 and concluding in 2032. Currently, the reservoir is expected to be substantially completed in 2032 with filling beginning in 2033. The amount of time it would take to fill Sites would depend greatly on hydrology and how Storage Partners choose to use their water during initial filling. Initial filling could range from approximately two years to over 10 years.

The Sites Project would use existing infrastructure to divert unregulated and unappropriated flow from the Sacramento River at Red Bluff and Hamilton City and convey the water to a new offstream reservoir west of the community of Maxwell, California. New and existing facilities would move water into and out of the reservoir. Releases from Sites would be used locally, be conveyed to the Yolo Bypass for ecosystem benefits, or ultimately return to the Sacramento River system via existing canals and a new pipeline located near Dunnigan. Water released from the reservoir would be used to benefit local, state, and federal water use needs, including public

[5] Mixed programmatic action means, for purposes of an incidental take statement, a Federal action that approves action(s) that will not be subject to further section 7 consultation, and also approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation.

water agencies, anadromous fish species in the Sacramento River watershed, wildlife refuges and habitats, and the Yolo Bypass to help supply food for Delta smelt.

The operational components of the Sites Project are listed in Table 10. The Sites Project is sufficiently developed for consideration at a framework level. Reclamation and the Sites Project Authority recently completed the Sites Project Final Environmental Impact Report/Environmental Impact Statement (Final Environmental Impact Report/Environmental Impact Statement - Sites Reservoir (sitesproject.org)) that analyzes the impacts of the project.

Table 10. Operational Programmatic Components of Proposed Sites Project

Sites Project Activity	Description
Diversions to Sites, Operating Criteria, and Diversion Criteria	All aspects of diversion of water at Red Bluff Pumping Plant, Hamilton City Pump Station, Stone Corral Creek, and Funks Creek, including the use of excess capacity in the Tehama-Colusa Canal and Glenn-Colusa Irrigation District Main Canal to convey water to the reservoir and storage of water in Sites. Specific descriptions of pulse protection at Bend Bridge, bypass flows at Red Bluff, Hamilton City and Wilkins Slough, and other diversion criteria are specified in Chapter 2, Section 2.5.2.1, page 2-78 through page 2-86 of the Sites Project Final EIR/EIS.
Water Conveyance and Releases from Sites	Releases of water from Sites into the Tehama-Colusa Canal, Glenn-Colusa Irrigation District Main Canal, Stone Corral Creek, and Funks Creek. Conveyance of water from the Tehama-Colusa Canal into the Dunnigan Pipeline and subsequent release into the Colusa Basin Drain and ultimately into the Sacramento River or Yolo Bypass. Releases from Sites are described in Chapter 2, Section 2.5.2.1, page 2-86 through 2-88 and page 2-90 through 2-91 of the Sites Project Final EIR/EIS.
Coordination with CVP and SWP	Exchanges with Shasta Reservoir and Oroville Reservoir, including Reclamation's investment in Sites as described in Chapter 2, Section 2.5.2.1, page 2-88 through 2-90 of the Sites Project Final EIR/EIS.
Flood Control	Flood control benefits to the communities of Maxwell and Colusa, local agricultural lands, rural residences, and Interstate 5 by impounding Funks Creek and Stone Corral Creeks as described in Chapter 2, Section 2.5.2.1, page 2-91 through 2-92 of the Sites Project Final EIR/EIS
Emergency Releases	Operation of facilities to meet Division of Safety of Dams criteria and requirements for emergency reservoir drawdown as described in Chapter 2, Section 2.5.2.1, page 2-92 of the Sites Project Final EIR/EIS
Energy Generation and Energy Use	As described in Chapter 2, Section 2.5.2.2, page 2-92 through 2-93 of the Sites Project Final EIR/EIS generation of energy in operations and use of energy for operations

Sites Project Activity	Description
Aquatic Monitoring and Adaptive Management	Implementation of an aquatics monitoring and adaptive management plan to (1) integrate the Project's adaptive management program with existing monitoring and science programs; (2) provide the proposed framework and governance, and (3) include the process for adaptive management, including operational criteria and conservation measures as described in various spots in Chapter 2 and Appendix 2D (2D.4, 2D.5, 2D.6) of the Sites Project Final EIR/EIS
Compensatory Mitigation for Temporary and Permanent Impacts	Species-specific compensatory mitigation actions that would be completed prior to operations as may be required in the projects permits and approvals

The Sites Authority would own and operate all newly constructed project facilities that are not already owned by another entity. There are currently 22 Storage Partners representing local and regional water delivery agencies that serve over 24.5 million people and over 500,000 acres of farmland that are paying for the Project and would receive the resulting water supply benefits. In addition, the State of California, through the California Water Commission, and Reclamation are also envisioned to be Storage Partners and receive water supply benefits.

Sites would be filled through the diversion of Sacramento River water that generally originates from unregulated tributaries to the Sacramento River downstream from Keswick Dam. Diversions to Sites could also come from flood releases from Shasta Reservoir. Diversions to Sites would be made from the Sacramento River at the existing Red Bluff Pumping Plant (RBPP) (RM 243) near Red Bluff into the Tehama-Colusa Canal and at the existing Glenn-Colusa Irrigation District (GCID) Hamilton City Pump Station (RM 205) near Hamilton City into the GCID Main Canal. Water could be diverted to storage in Sites from September 1 to June 14. Diversions would occur only when all of the following conditions are met:

- Flows in the Sacramento River exceed the minimum diversion criteria (described in Table 11;
- The Delta is in "excess" conditions as determined by Reclamation and DWR and would remain in excess conditions during diversions;
- Senior downstream water rights, existing CVP and SWP and other water rights diversions including Section 215 of the Reclamation Reform Act of 1992, Article 3(f) water, and SWP Article 21 (interruptible supply), and other more senior flow priorities have been satisfied;
- Flows are available for diversion above those flows needed to meet all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time that diversion occurs ; and
- There is available capacity at the RBPP and in the Tehama-Colusa Canal and GCID facilities to divert and convey water to Sites, above the capacity needed for deliveries to existing Tehama-Colusa Canal users and within the GCID service area.

The RBPP would serve as the primary diversion location and would divert water from the Sacramento River to Funks Reservoir through the Tehama-Colusa Canal and into the Sites through the Funks Pumping and Generating Plant and the Inlet/Outlet Works. A maximum of approximately 2,120 cfs would be diverted at the RBPP for the project. The Hamilton City Pump Station would serve as the secondary diversion location and would divert water from the Sacramento River to the new Terminal Regulating Reservoir through the GCID Main Canal and into the Sites through the Terminal Regulating Reservoir Pumping and Generating Plant and the Inlet/Outlet Works. A maximum of approximately 2,070 cfs would be diverted at the Hamilton City Pump Station for the project. Although the RBPP would be the primary diversion point, both diversion facilities would be operated simultaneously when river conditions and capacity are available for a maximum combined diversion rate of about 4,200 cfs (3,900 cfs, plus losses). Table 11 provides a summary of the Sites project minimum diversion criteria.

Table 11. Summary of Project Diversion Criteria (this is Table 2-5 from the Final EIR/EIS)

Location (Listed from North to South)	Criteria
Bend Bridge Pulse Protection	Protection of all qualified precipitation-generated pulse events (i.e., peaks in river flow rather than scheduled operational events) from October to May based on predicted hydrology and monitoring. A criterion based on the detection of migrating fish may be added if a fish monitoring method can be demonstrated as effective and reliable. A qualified precipitation-generated pulse event is determined based on forecasted flows, and pulse protection may cease after seven days or earlier if flows at Bend Bridge exceed 29,000 cfs and Project diversions subtracted from Bend Bridge flows continue to be at least 25,000 cfs.
Minimum Bypass Flows in the Sacramento River at the RBPP	3,250 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design
Minimum Bypass Flows in the Sacramento River at the Hamilton City Pump Station	4,000 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	10,700 cfs from October 1 to June 14; 5,000 cfs in September (no diversions to Sites from June 15 to August 31)
Freeport, Net Delta Outflow Index, X2, and Delta Water Quality	Operations consistent with all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time that diversion occurs

cfs = cubic feet per second; RBPP = Red Bluff Pumping Plant.

The Sites project diversion criteria have been analyzed extensively and are not expected to change substantially. However, criteria may be refined in actual project operations through adaptive management and in coordination with the fisheries agencies. In particular, adaptive management actions would focus on the following: (1) Bend Bridge Pulse Protection; (2) the

Minimum Bypass Flows in the Sacramento River at Wilkins Slough; Fremont Weir Notch Protections (Big Notch Project); sediment monitoring, modeling and reintroduction; and fish monitoring and technical studies related to near-field effects.

9.2 Delta Conveyance Project

The proposed DCP project includes the construction and operation of new water intake facilities on the Sacramento River in the north Delta and a single main tunnel to divert and move water entering the north Delta from the Sacramento Valley watershed to existing SWP facilities in the south Delta, which would result in a dual conveyance system for the SWP in the Delta (see Table 12 for additional details on operations of the proposed project [i.e., DCP Public Draft EIR Alternative 5, Bethany Reservoir Alignment]).

DWR would implement "dual conveyance" by operating the proposed north Delta diversion in conjunction with the existing south Delta diversion system for the SWP. During winter and spring, operations of existing south Delta water export facilities would be prioritized up to what is permitted under the existing water rights and all applicable state and federal law and regulations, before operating the proposed north Delta intakes. During summer/fall, operations would be focused on more efficient Delta salinity management. The south Delta exports and the north Delta diversions would be balanced and adjusted to meet the State Water Board D-1641 salinity requirements at the western Delta stations on the Sacramento and San Joaquin Rivers (e.g., increasing salinity at Jersey Point would cause a shift in diversions from south Delta to north Delta, whereas increasing salinity at Emmaton would cause a shift from north Delta to south Delta). This operation is expected to result in a more efficient system operation. DWR is not seeking to increase its existing water rights, nor is it proposing operational changes upstream of the Delta.

For purposes of the USACE DCP Biological Assessment, project-specific effects associated with construction and placement of DCP facilities, including in-water work, as well as both temporary and permanent impacts, will be covered under the USACE's section 7 consultation. All effects associated with the north Delta diversion intake operations, including near- and far-field effects within the river as well as potential associated effects on aquatic biological resources, are assessed through the Programmatic LTO analysis. Table 12 describes key operational programmatic components of the DCP.

Table 12. Operational Programmatic Components of Delta Conveyance Project

DCP Project Activity	Description
North Delta Intake Diversions	The proposed intakes would augment the ability to capture excess flows and improve the flexibility of SWP operations (e.g., improved salinity management during the summer/fall). New operational criteria would govern the diversions at the proposed north Delta intakes to minimize effects near and downstream of the new intakes. See Section 3.16 of the DCP Public Draft EIR for additional details on project operations.
SWP Integration	The north Delta intakes would operate in conjunction with the existing SWP south Delta intakes. For example, during the winter and spring, the SWP would first use south Delta facilities to export water up to what is permitted under the existing water rights and all applicable state and federal law and regulations before diverting from the new north Delta intakes. Upstream SWP storage operations would continue to be managed to the existing and future regulatory and contractual obligations of the SWP in determining the amount of stored water available for exports. The DCP would not change operational criteria associated with upstream reservoirs (Section 3.16.3, DCP Public Draft EIR).
Coordination with CVP	Continued SWP coordination with CVP through the Coordinated Operations Agreement, consistent with applicable regulatory requirements (Section 3.16, DCP Public Draft EIR).
Adaptive Management and Monitoring Program	The Adaptive Management and Monitoring Program would be used to evaluate and consider changes in operational criteria, if necessary, based on information gained before and after the new facilities become operational. This program would be used to consider and address scientific uncertainty regarding the Delta ecosystem and potential effects of the project. In addition, an adaptive management and monitoring plan would be prepared for each mitigation site to help ensure habitat creation goals are met. (Section 3.18, DCP Public Draft EIR).
Conservation Measures	Included to avoid, minimize, and offset effects of the proposed action on listed species. This includes compensatory mitigation to be completed prior to operations at the acreages identified for each species. (Appendix 3F, DCP Public Draft EIR).

The north Delta diversion (NDD) would not alter operating criteria for existing facilities (e.g., upstream reservoirs or south Delta diversions), would be subject to existing and updated Delta water quality requirements (e.g., D-1641), and would not alter SWP/CVP water right permits (beyond the addition of new points of diversions). Existing south Delta diversions would be operated preferentially, with use of the NDD focused on periods of excess flow conditions in the Delta and to optimize salinity management in the summer and fall. Specific operational criteria focusing on minimizing potential effects on aquatic resources and listed fish would further govern NDD operations. Table 13 through Table 15 describe the proposed DCP operational criteria.

Table 13. Delta Conveyance Project Preliminary Proposed Operations Criteria (North Delta Diversion Operations)

Parameter	Delta Conveyance Project Criteria
Bypass Flow [a] (specifies bypass flow required to remain downstream of the north Delta intakes)	• October through November: Minimum flow of 7,000 cfs required in river after diverting at the north Delta intakes. • December through June: Once the pulse protection (see below) ends, north Delta diversions would not exceed Level 1 pumping unless specific criteria have been met to increase to Level 2 or Level 3. If those criteria are met, operations can proceed as defined in Table 14. Allowable diversion would be the greater of the following options: low-level pumping or the diversion allowed by the bypass flow rules in the following table. • July through September: Minimum flow of 5,000 cfs required in river after diverting at the north Delta intakes.
Pulse Protection (October through June)	• Low-level pumping is allowed when river conditions are adequate during the pulse protection period. • Definition: Low-level pumping of up to 6% of total Sacramento River flow at Freeport such that diversions would not reduce bypass flow below 5,000 cfs. No more than a total of 900 cfs can be diverted by all the intakes combined. Low-level pumping can occur in October–November during a pulse protection event and in December–June as defined in the following table. In addition, north Delta diversion levels at all the intakes would be subject to a maximum approach velocity of 0.2 feet per second and a minimum sweeping velocity of 0.4 feet per second at the proposed fish screens. Velocity compliance would be informed by real-time hydrological data measured at the intake locations. • Pulse triggering, duration, and conclusion is determined based on the criteria defined in the following table. • If the initial pulse begins before December 1, the bypass flow criteria for the month (October and November) when the pulse occurred would take effect, following a pulse protection period. On December 1, the Level 1 rules defined in the following table apply unless a second pulse occurs.
Real-Time Operations	• The proposed operations criteria and tidal restoration mitigation are intended to minimize and fully mitigate the potential impacts of the NDD operations. The real time decision making specific to the NDD operations would be mainly associated with reviewing real-time abiotic and fish monitoring data and ensuring proposed weekly, daily and sub-daily operations are consistent with the permitted criteria and within the effects analyzed in the permits.
Adaptive Management	• The Operations Adaptive Management and Monitoring Program would be used to evaluate and consider changes in operational criteria based on information gained before and after the new facilities become operational. This program would be used to consider and address scientific uncertainty regarding the Delta ecosystem and to inform project operations.

cfs = cubic feet per second; NDD = north Delta diversion

[a] Sacramento River flow upstream of the intakes to be measured flow at Freeport. Bypass flow is the 3-day tidally averaged Sacramento River flow computed as flow measured at Freeport minus the diversion rate. Sub-daily north Delta intakes' diversion operations would maintain fish screen approach and sweeping velocity criteria.

Table 14. Proposed North Delta Diversion Bypass Flow and Pulse Protection Requirements

Proposed Requirements	Criteria
Pulse Protection	• Low-level pumping would be allowed when river conditions are adequate during the pulse protection period. Initiation of the pulse protection is defined by the following criteria: (1) Sacramento River daily average flow at Wilkins Slough increase by more than 45% within a 5-day period and (2) flow on the 5th day greater than 12,000 cfs. • The pulse protection continues until either (1) Sacramento River flow at Wilkins Slough returns to pre-pulse flow level (flow on first day of 5-day increase), or (2) Sacramento River flow at Wilkins Slough decreases for five consecutive days, or (3) Sacramento River flow at Wilkins Slough is greater than 20,000 cfs for 10 consecutive days. After pulse period has ended, operations would return to the bypass flow table (Table 15). • If the initial pulse period begins before Dec 1, then any second pulse that may occur during December through June would receive the same protection, i.e., low-level pumping, resulting in up to two pulses which would receive this protection per water year.
Bypass Flow Criteria	• After initial pulse(s), allowable diversion would be subject to Level 1 bypass flow criteria (Table 15) until 15 total days of bypass flows above 20,000 cfs occur. Then allowable diversion would be subject to the Level 2 bypass flow criteria until 30 total days of bypass flows above 20,000 cfs occur. Then allowable diversion would be subject to the Level 3 bypass flow criteria

Table 15. North Delta Diversion Bypass Flow Criteria

Period	Level [a]	If Sacramento River flow		The bypass is...
		Is over...	But not over...	
December through April [b]	1	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	15,000 cfs	Flows remaining after low-level pumping
		15,000 cfs	17,000 cfs	15,000 cfs plus 80% of the amount over 15,000 cfs
		17,000 cfs	20,000 cfs	16,600 cfs plus 60% of the amount over 17,000 cfs
		20,000 cfs	no limit	18,400 cfs plus 30% of the amount over 20,000 cfs
	2	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	11,000 cfs	Flows remaining after low-level pumping
		11,000 cfs	15,000 cfs	11,000 cfs plus 60% of the amount over 11,000 cfs
		15,000 cfs	20,000 cfs	13,400 cfs plus 50% of the amount over 15,000 cfs
		20,000 cfs	no limit	15,900 cfs plus 20% of the amount over 20,000 cfs

Period	Level [a]	If Sacramento River flow		The bypass is...
		Is over...	But not over...	
	3	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	9,000 cfs	Flows remaining after low-level pumping
		9,000 cfs	15,000 cfs	9,000 cfs plus 50% of the amount over 9,000 cfs
		15,000 cfs	20,000 cfs	12,000 cfs plus 20% of the amount over 15,000 cfs
		20,000 cfs	no limit	13,000 cfs plus 0% of the amount over 20,000 cfs
May [b]	1	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	15,000 cfs	Flows remaining after low-level pumping
		15,000 cfs	17,000 cfs	15,000 cfs plus 70% of the amount over 15,000 cfs
		17,000 cfs	20,000 cfs	16,400 cfs plus 50% of the amount over 17,000 cfs
		20,000 cfs	no limit	17,900 cfs plus 20% of the amount over 20,000 cfs
	2	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	11,000 cfs	Flows remaining after low-level pumping
		11,000 cfs	15,000 cfs	11,000 cfs plus 50% of the amount over 11,000 cfs
		15,000 cfs	20,000 cfs	13,000 cfs plus 35% of the amount over 15,000 cfs
		20,000 cfs	no limit	14,750 cfs plus 20% of the amount over 20,000 cfs
	3	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	9,000 cfs	Flows remaining after low-level pumping
		9,000 cfs	15,000 cfs	9,000 cfs plus 40% of the amount over 9,000 cfs
		15,000 cfs	20,000 cfs	11,400 cfs plus 20% of the amount over 15,000 cfs
		20,000 cfs	no limit	12,400 cfs plus 0% of the amount over 20,000 cfs
June [b]	1	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	15,000 cfs	Flows remaining after low-level pumping
		15,000 cfs	17,000 cfs	15,000 cfs plus 60% of the amount over 15,000 cfs
		17,000 cfs	20,000 cfs	16,200 cfs plus 40% of the amount over 17,000 cfs
		20,000 cfs	no limit	17,400 cfs plus 20% of the amount over 20,000 cfs
	2	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	11,000 cfs	Flows remaining after low-level pumping
		11,000 cfs	15,000 cfs	11,000 cfs plus 40% of the amount over 11,000 cfs
		15,000 cfs	20,000 cfs	12,600 cfs plus 20% of the amount over 15,000 cfs
		20,000 cfs	no limit	13,600 cfs plus 20% of the amount over 20,000 cfs

Period	Level [a]	If Sacramento River flow		The bypass is…
		Is over…	But not over…	
	3	0 cfs	5,000 cfs	100% of the amount over 0 cfs
		5,000 cfs	9,000 cfs	Flows remaining after low-level pumping
		9,000 cfs	15,000 cfs	9,000 cfs plus 30% of the amount over 9,000 cfs
		15,000 cfs	20,000 cfs	10,800 cfs plus 20% of the amount over 15,000 cfs
		20,000 cfs	no limit	11,800 cfs plus 0% of the amount over 20,000 cfs
July through September	N/A	0 cfs	5,000 cfs	100% of the amount over 0 cfs
	N/A	5,000 cfs	No limit	A minimum of 5,000 cfs
October and November	N/A	0 cfs	7,000 cfs	100% of the amount over 0 cfs
	N/A	7,000 cfs	No limit	A minimum of 7,000 cfs

cfs = cubic feet per second.

[a] Level 1, Level 2 and Level 3 Bypass Flow Criteria do not apply July through November. Minimum Bypass Flow Criteria are applicable July through November as described in the table.

[b] Allowable diversion would be the greater of the low-level pumping or the diversion allowed by the following bypass flow rules.

9.3 Guiding Principles

Guiding principles inform the upfront development of operational criteria and measures to avoid or minimize effects on listed species and critical habitat, including possible adjustment through adaptive management, that would be analyzed in the subsequent consultations. Current proposed operational criteria will be included and considered through quantitative assessments, as applicable. Potential operational refinements will be informed by the programmatic analysis (e.g., potential need for changes to the DCP Bypass Flow criteria), which will guide subsequent project-level consultations. Adaptive Management is intended to further address outstanding uncertainties up to, and throughout, the operations phase. Implementation goals are included to provide the necessary level of information to inform the programmatic section 7 analysis.

The following guiding principles are relevant to both projects, with some specific application to each project noted. Note that DCP would not create changes to baseline SWP or CVP upstream reservoir operational criteria. The DCP would be operated in a manner that does not impact either DWR or Reclamation's ability to operate upstream reservoirs to meet existing and future criteria and regulations. The guiding principles for regions upstream from the Delta are therefore specific only to Sites.

9.3.1 Upper Sacramento River (Sites Only)

Utilize the additional water supply provided by the Sites Project to address adverse effects of the CVP on salmonid and sturgeon habitat in the Sacramento River above the Red Bluff Pumping Plant by:

- Optimizing the use of Reclamation's storage to facilitate the following:

- Enhancing conservation of the coldwater pool in Shasta Reservoir for use in managing water temperatures in salmonid spawning habitat downstream of Keswick Dam particularly in dry water year types

- Enhancing pulse flows envisioned in the Biological Assessment at appropriate times, particularly in years when natural pulse events are minimal, to stimulate migration of juvenile salmon downstream toward the Delta

- Stabilizing flow to minimize or preclude losses of salmon redds due to flow fluctuations associated with management of Shasta Reservoir for fall storage

- Implementing additional mitigation actions as necessary and appropriate to improve spawning and rearing habitat for anadromous fish in the Upper Sacramento River

9.3.2 Sacramento River from Red Bluff Pumping Plant to Knights Landing (Sites Only)

- Implement actions necessary to minimize potential impacts to listed species exposed to diversion facilities.

- Implement pulse flow criteria to provide migrating anadromous fish an opportunity to migrate past the diversion locations with minimum exposure to diversions.

- Utilize best available science to establish flow levels necessary to provide migratory and rearing habitat to minimize effects on juvenile anadromous fish survival and facilitate their movement out of the river toward the Delta and bays.

- Find opportunities to develop and/or restore additional side channel habitat to offset adverse effects on salmonid migratory and rearing habitat associated with diversions of flow to Sites.

9.3.3 Below Knights Landing and in the Delta

- Operate projects consistent with existing and/or future regulatory requirements in the Delta.

- Implement pulse flow criteria to provide migrating anadromous fish an opportunity to migrate past the diversion locations with minimum exposure to diversions and further minimize effects on through-Delta survival.

- Utilize best available science to establish flow levels necessary to provide migratory and rearing habitat to minimize effects on juvenile anadromous fish survival and facilitate their movement out of the river toward the Delta and bays.

- Monitor and mitigate effects of diversions on habitat for Delta pelagic fish species through identification and implementation of opportunities to develop additional habitat (i.e., tidal habitat restoration) to improve productivity of those fish populations.

- Monitor and mitigate effects of diversions on migrating anadromous species and their habitat through identification of opportunities to develop additional habitat (i.e., tidal and channel margin restoration) to improve productivity of those fish populations.

- Protect habitat conditions supporting listed pelagic and anadromous species, mitigate potential flow related effects of Sites and DCP with habitat restoration developed in coordination with NMFS, USFWS, and CDFW to improve productivity of those fish populations.

Sites:

- Cooperate in the monitoring of the Fremont Weir Big Notch Project to assess what effect, if any, diversions of flow to Sites have on the effectiveness of the Big Notch Project in the entrainment of juvenile anadromous fish through the notch on the floodplain habitat in the Yolo Bypass and the passage of anadromous fish from the Yolo Bypass into the Sacramento River. If necessary, implement operational measures to avoid diminishing the performance of the Big Notch Project.

DCP:

- Implement project operations and maintenance consistent with the proposed project description, as an integrated component of the SWP.

- Future consultation on DCP Operations and Maintenance is envisioned to update and align elements of project description with conditions (e.g., regulatory, climate, status of species) in advance of operations of the north Delta diversions.

10. Drought

Reclamation and DWR will continue to maintain a Drought Toolkit[6] with actions that can reduce impacts throughout the Central Valley in dry conditions. The Drought Toolkit provides potential actions for when resources are limited. These limited resources may include, but are not limited to hydrology, current and projected reservoir storages, facility limitations and fish conditions.

One specific action is the ability to increase upstream storage of water by submitting a Temporary Urgency Change Petitions (TUCPs) to the SWRCB to modify the Objectives of D-1641 to provide increased operational flexibility. The historical conditions in which Reclamation and DWR requested a TUCP are representative of the hydrologic conditions under which a future TUCP may be submitted to the SWRCB.

In conditions of potential drought and dry years, Reclamation and DWR, through Governance, would meet and confer on measures to be considered for implementation. The Drought Relief Year Team Monthly Action List (Attachment) includes the minimum decisions required each month.

[6] https://www.usbr.gov/mp/bdo/docs/droughttoolkit-latest.pdf

11. Governance

Governance establishes how Reclamation and DWR may provide information and seek input during their independent responsibility and authority to comply with environmental laws while meeting the needs of communities to achieve a reasonable balance among competing demands for use of CVP and SWP water, including environmental, water supply and power generation. The scope of Governance includes:

- Notifications: Weekly Assessments, Fish and Water Outlook Meetings, Water Temperature Threshold Exceedance.
- Seasonal Actions:
    - Planning pulse flows, variable hydrographs, and specific tributary actions.
    - Seasonal reports as a technical record of decisions and outcomes from monitoring
- Annual Report: compliance responsibilities including commitments in the proposed action and terms and conditions of incidental take statements.

Other Federal, State, and Local Agencies (collectively the "Agencies"), interested parties, and/or the interested public do not share the mission requirements of Reclamation and DWR. Reclamation and DWR are required to use the best scientific and commercial data available and therefore, benefit from input from these parties on seasonal actions and scientific information for reporting. Carefully considered roles and responsibilities, coordination forums, scientific standards, and decision-making processes balance incorporating individual biological expertise with the need to respect Reclamation's and DWR's environmental, water supply, and power authorities. The regulatory processes by which NMFS and USWFS may imposed additional limitations on the operations of the CVP and SWP are separate from implementation of a biological opinion and would occur through consultation, when required.

Adaptive management within the context of Reclamation and DWR activities generally is associated with investments in science and other activities for the environment that occur in the future and do not require consultation and permitting as part of the immediate need to operate the CVP and SWP, therefore; adaptive management and its associated Governance is not included in the Action 5 section 7 consultation purposes for the Long-Term Operation of the CVP and SWP. Reclamation is not requesting incidental take coverage for adaptive management for Action 5.

11.1 Roles and Responsibilities

Reclamation has the delegated responsibility assigned by the U.S. Congress, through the Secretary of the Interior, for the operation of the CVP and meeting its environmental, water supply, and power generation project purposes. Reclamation is responsible for the operation of

the CVP and for compliance with the ESA and cannot cede its obligation to another agency. DWR, as an applicant, and in consideration of section 7 coverage for the Delta facilities of the SWP, is responsible for operation consistent with terms and conditions of Biological Opinions adopted in the Record of Decision. The SRS Contractors, in consideration of section 7 coverage for the operation of their diversions along the Sacramento River, is responsible for actions identified under the Shasta Framework components, consistent with terms and conditions of Biological Opinions adopted in the Record of Decision. The Sites Joint Powers Authority, as an applicant for the Sites, and in consideration of section 7 coverage for the operation of Sites, is responsible for the Sites Framework Programmatic components, and terms and conditions adopted in the Record of Decision.

Section 7 of the ESA requires Reclamation to consult with USFWS and NMFS where Reclamation has discretionary Federal involvement or control over an action. Specifically, Reclamation, in consultation with the USFWS and NMFS under Section 7 of the ESA, is responsible for ensuring that any action authorized, funded, or carried out by Reclamation is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. In fulfilling this requirement, Reclamation shall use the best scientific and commercial data available.

Reclamation determines whether and how to proceed with its proposed action in light of USFWS' and NMFS' biological opinion, even though the terms and conditions of incidental take statements are non-discretionary. If a reasonable and prudent alternative (RPA) is issued by NMFS and/or USFWS as part of their biological opinions, Reclamation may choose not to implement USFWS' or NMFS' reasonable and prudent alternative; instead, Reclamation can choose to develop a new proposed action. Reclamation would then request section 7 consultation on that new proposed action. While Reclamation is consulting, Reclamation cannot make an irretrievable or irreversible commitment of resources that would preclude an RPA. If challenged in court during reinitiation, the standard for review for Reclamation will be whether Reclamation's decision was arbitrary and capricious under the Administrative Procedures Act.

Reclamation is responsible for notifying USFWS and NMFS on acceptance of a biological opinion and will provide that for the LTO via a ROD, operating in compliance with the exemption granted by the incidental take statement, and reinitiating consultation if any of the four triggers for reinitiation are exceeded.

The Regional Director of Reclamation's California-Great Basin Region makes decisions on the operation of the CVP and the Long-Term Operation Plan. The Director of DWR makes decisions as an Applicant under section 7 for consultation items specific to the SWP.

Figure 10 shows engagement with local, state, and federal agencies and interested parties through forums that support an Operations Group. These forums allow for soliciting input on the seasonal water operation needs between Reclamation's Bay-Delta Office (BDO) and Central Valley Operations Office (CVO) and DWR's Division of Integrated Science and Engineering (DISE) and Operations Control Office (OCO). Reclamation and DWR always plan for a potential drought. Each drought develops in a unique manner that requires different tradeoffs. The Drought Response Year (DRY) team supports a drought toolkit for potential actions.

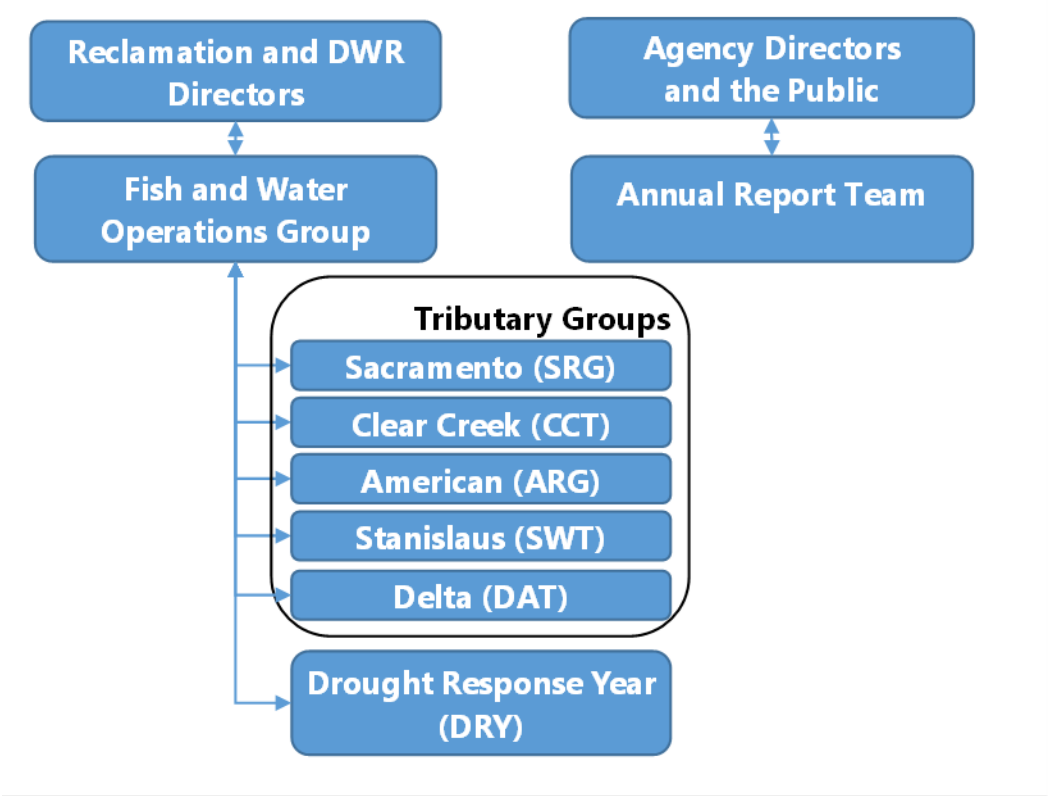

Figure 10. Engagement Forums for the Operation of the CVP and SWP

An annual report team, inclusive of all the agencies and interested parties, supports engagement on compliance with commitments in the proposed action and compliance with the terms of incidental take statements. The Annual Report provides the Agency Directors and the Public an opportunity to review prior actions and provide input based on regulatory authorities.

The proposed Governance relies on decision making among the action agencies and technical input on specific actions as described below. The directors of NMFS and USFWS would address reinitiation of consultation through a separate process specific to reinitiation, if needed, and as described by 50 CFR 402.16.

11.2 Forums for Input

Reclamation and DWR are responsible for the operation of CVP and SWP facilities in compliance with NEPA, ESA, and applicable laws under this Proposed Action. Certain responsibilities are assigned to applicants and local water agencies. Reclamation and applicants benefit from the incorporation of input from agencies and interested parties. Forums are established for the purpose of sharing operational plans via notifications, gathering scientific and commercial data to inform the operation of the CVP and SWP, and for reporting the outcomes of operations. Forums do not make decisions nor seek consensus.

Participants in these forums follow group norms and expectations. These include following the Guidance Documents, providing scientific expertise and timely input on assessments, and preparing their Fish and Water Operations Group (FWOG) member, when needed. To the extent practical, meetings are scheduled in advance, materials are all accessible online, and all participants are provided an opportunity for input during the meeting. All participants at these meetings are expected to have reviewed preliminary documents, evaluated available data, and prepared additional materials for meeting. All participants are expected to raise critical issues as soon as possible and, to the extent practical, discuss the uncertainties, ambiguities, issues with the appropriate parties ahead of any meeting.

11.2.1 Sacramento River Group

The SRG is comprised of agency representatives and interested parties.

Unless impracticable, monitoring information on species and conditions will be made available through open and accessible tools. The SRG will receive notifications on decisions related to:

- Monthly Operation Forecast
- Adjustments for Minimum Instream Flows above the SAC Gage
- TCCA Frost Protection and Early Season Diversions
- Adjustments for Wilkins Slough Minimum Flows

The SRG may provide input on the following seasonal actions:

- Ramping Rate Deviations to Conserve Storage
- Wilkins Slough October Maximum Flows
- Central Valley Project Pulse Flows
- Voluntary Agreement Flow Measures
- Wilkins Slough Minimum Flow Relief
- Rice Decomposition Scheduling
- Fall Release Ramp Down
- Fall and Winter Base Flow
- Water Temperature Management Plan

Each year, Reclamation will prepare and make available for suggested edits by the members of the SRG, reports on:

- Water Temperature Management Seasonal Report

- Reservoir Refill and Spring Pulse Seasonal Report

11.2.2 Clear Creek Team

The Clear Creek Team (CCT) is comprised of agency representatives and interested parties.

Unless impracticable, monitoring information on species and conditions will be made available through open and accessible tools. The members of the CCT will receive notifications on decisions related to:

- Ramping Rate Deviations

The members of CCT may provide input on the following Seasonal Actions:

- Seasonally Variable Hydrograph
- Pulse Flows
- Location and Timing of a Segregation Weir

Each year, Reclamation will prepare and make available for suggested edits by the members of the CCT, a report on Clear Creek Seasonal Operations.

11.2.3 American River Group

The American River Group (ARG) is comprised of agency representatives and interested parties.

Unless impracticable, monitoring information on species and conditions will be made available through open and accessible tools. The members of the ARG will receive notifications on decisions related to:

- Monthly Operations Forecasts

The members of the ARG may provide input on the following Seasonal Actions:

- Faster down ramping rate for critical monitoring or maintenance needs
- Scheduling Spring Pulse Flows
- Modification to the Automated Temperature Selection Procedure Schedule including actions to minimize temperature impacts when temperatures are unsuitable for rearing or spawning.

Each year, Reclamation will prepare and make available for suggested edits by the members of the ARG, a report on American River Seasonal Operations.

11.2.4 Delta Actions Team

The Delta Actions Team (DAT) is comprised of agency representatives and interested parties.

Unless impracticable, monitoring information on species and conditions will be made available through open and accessible tools. The DAT will receive notifications on decisions related to:

- Suisun Marsh Salinity Control Gate
- Delta Smelt Supplementation

The DAT may provide input on the following Actions:

- Suisun Marsh Salinity Control Gate
- Weekly Assessments

The DAT may provide input on the following Delta annual Seasonal Reports:

- Delta Smelt Summer and Fall Habitat Seasonal Report
- Entrainment Management Seasonal Report

11.2.5 Stanislaus Watershed Team

The members of the Stanislaus Watershed Team (SWT) is comprised of agency representatives and interested parties.

Unless impracticable, monitoring information on species and conditions will be made available through open and accessible tools. The members of the SWT will receive notifications on decisions related to:

- Monthly Operations Forecasts

The members of the SWT may provide input on the following Actions:

- Faster down ramping rate for critical monitoring or maintenance needs
- Winter Instability Flows
- Spring Pulse Flows
- Fall Pulse Flows

Each year, Reclamation will prepare and make available for suggested edits by the members of the SWT, a report on Stanislaus River Seasonal Operations.

11.2.6 Fish and Water Operations Group

The FWOG is comprised of agency and interested party management representatives. The purpose of this group is to provide a comprehensive look across the CVP and SWP and to check the work and resolve performance and conduct matters by tributary groups.

Unless impracticable, monitoring information on species and conditions will be made available through open and accessible tools. The members of the FWOG will receive notifications on:

- Weekly Fish and Water Outlook

The members of the FWOG may provide input on the following Actions:

- Weekly Assessments
- Monitoring Program

The members of the FWOG should oversee technical teams that provide review and ensure input on seasonal and annual reports.

11.2.7 Drought Response Year Team

The DRY Team is comprised of agency representatives and interested parties.

The members of the DRY Team will receive notifications on:

- Activation of Measures in the Monthly Drought Checklist

The members of the DRY Team may provide input on the following actions:

- Measures called for by the Drought Toolkit
- TUCP applications

Each year of an action, Reclamation will prepare and make available for suggested edits by the members of the DRY Team:

- Drought Toolkit Updates
- Drought Reporting

11.2.8 Annual Report Team

The Annual Report Team (ART) is comprised of agency representatives and interested parties.

The members of the ART will receive notification on:

- Exceedance of Incidental Take

There are not specific actions, the ART is primarily for reporting on prior year actions.

Each year, Reclamation will prepare and make available for suggested edits by the members of the ART, an Annual Report.

11.3 Scientific Standards

The development of seasonal and real-time operations is expected to follow the Daubert standards for whether the action:

- Can be or has been tested,
- Uses science subjected to publication and peer review,
- Has a known potential error rate,
- Has maintained standards controlling application, and
- Has widespread acceptance within a relevant scientific community.

The Services have jointly published a policy on Information Standards Under the ESA [59 FR 34271 (July 1, 1994)] (see copy in Appendix A). This policy calls for Service biologists to gather, review, and evaluate information prior to preparing biological opinions, incidental take statements, and biological assessments and to ensure that any information used by the Services to implement the ESA is reliable, credible, and represents the best scientific and commercial data available.

NMFS, in its 2009, 2019, and 2024 Biological Opinions, described an approach for it to ensure stressor effect evaluation is based on the best available information. This weight of evidence framework was based on independent projects in the Central Valley including the Delta Regional Ecosystem Restoration Implementation Program and Sacramento River Science Partnership. The constructed scale for characterizing the analytical method and statistical power of data used in describing stressor effects are as follows:

- High: Supported by multiple scientific and technical publications, especially if conducted on the species within the area of effect, quantitative data, and/or modeled results; high power in interpretation of analytical results
- Low: One study, or unpublished data, or scientific hypotheses that have been articulated but not tested; low power in interpretation of analytical result

Reclamation would additionally weigh publication in national and international journals higher than local or regional journals.

Reclamation, Departmental, and OMB policies govern scientific integrity. These procedures were established to maintain a practice and culture of scientific integrity. These include a code of conduct, requirements for use and dissemination of scientific information, and assignment of responsibilities. The policy and code of conduct set the expectation for honest investigation, open discussion, refined understanding, commitment to evidence, appropriate scientific dissent and peer review. Open communication plays a valuable role in building public trust and understanding of Reclamation's and other federal agencies work. Scientific activities are advanced through well-documented protocol in a systematic manner, and loss of scientific

integrity may occur when falsification, fabrication, or plagiarism interferes with the proposal, performance, or review of these activities. These policies apply to outside parties who provide services and interact with Reclamation and other federal agencies under written agreements.

12. Adaptive Management Plan

Reclamation and DWR intend to use Structured Decision Making (SDM) to adaptively manage the operation of the CVP and SWP. The purpose of adaptive management will be to identify the uncertainties driving components of the LTO that impact the performance of the environmental, water supply, or power generation purposes and to develop alternative actions to address them. SDM provides an organized framework to reduce cognitive biases and objectively weigh alternatives against metrics while incorporating scientific and environmental uncertainty.

Reclamation and DWR will continue to seek opportunities to advance the environmental, water, and power functions of the CVP and SWP, respectively, through adaptive management. Agencies and interested parties have expertise and familiarity with the science and rational behind adaptive management, streamlining any required updated consultation and permitting.

Reclamation and DWR are not consulting on adaptive management. Any study that requires incidental take would be evaluated for independent utility or tiered into a subsequent environmental compliance process, including ESA consultation.

12.1 Adaptive Management Framework

Actions are generally structured into groups to establish expectations on the development effort and timelines.

- Group 1 actions are described within an alternative with defined objectives, performance metrics, and associated monitoring. Actions are consulted upon for biological opinions. These are generally the watershed specific pulse flows, temperature management, and Delta operations.

- Group 2 actions represent learning that improves management over the next three to eight years. Changes to an action will require an evaluation of reinitiation of consultation triggers. These actions include:

    - Entrainment Management

        - Winter-run Chinook Salmon OMR Management

        - Spring-run Chinook Salmon OMR Management

        - Steelhead JPE

        - Longfin Smelt Science Plan Actions

    - Delta Smelt Summer and Fall Habitat

    - Shasta Spring Pulse Flow Studies
    - Shasta Coldwater Pool Management
    - American River Minimum Flow Management Standards
- Group 3 actions represent learning over long periods on the order of 10-15 years. Changes are expected to require reinitiation of consultation.
    - Tributary Habitat Restoration Effectiveness for Salmonid Fishes
    - Tidal Habitat Restoration Effectiveness for Smelt Fishes
    - Spring Delta Outflow
    - Delta Smelt Supplementation
    - Winter-Run Reintroduction to the McCloud River and Battle Creek

The framework provides a snapshot based on current understanding of uncertainties and may be revised during implementation.

12.2 Governance for Adaptive Management under NEPA

Reclamation and DWR will establish a Management Committee to undertake and maintain Structured Decision Making for the operation of the CVP And SWP. The purpose of the management committee is to share information and bring together resources where interests and abilities align. The Management Committee will follow the following principles:

- Participatory: the communities impacted by decisions have a meaningful ability to inform them.
- Accountable: participants prioritize following through on commitments and can expect others to reciprocate.
- Relevant: the scope of activities and products are applicable to specific needs.
- Transparent: data, models, feedback, and responses are open and accessible to the public.
- Innovative: fostering a culture that expands the range of tools and techniques.

Participants and roles would include, at minimum:

- Lead and Alternate Representatives: individuals with the authority to commitment resources and represent the interests of their principal decision maker for:
    - CVP Contractors

- SWP Contractors
- Environmental NGO
- Tribes
- Bureau of Reclamation
- California Department of Fish and Wildlife
- California Department of Water Resources
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service

  Representatives are responsible for making commitments within a reasonable expectation of their authorities.

- Observers: Additional technical experts and parties with expertise and information that may be engaged to develop information and would benefit from hearing discussions directly. Observers are responsible to notify their representatives when a caucus is required.

Parties would seek to compile input through an additive process that does not seek consensus and does not require dispute resolution. The directors of the federal and state agencies make decisions consistent with their respective authorities.

Reclamation may identify a need for neutral facilitators and more decision support analysts to assist in structured decision making. Individual efforts may require sub-teams to be charted by the Management Committee. The representatives and alternates may differ depending on the topic.

12.3 Special Studies (Science Collaboration)

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 federally listed species, over time they may inform the effectiveness of measures taken to avoid, minimize, or mitigate incidental take. Studies are incorporated for the following reasons:

- The study design is complete, implementation is needed to operate under the proposed action for the LTO, and success is not reliant on requiring flexibility to make future changes.

- Incidental take is likely required: This consultation seeks the necessary incidental take coverage, if not already covered.

- The new information may reveal effects and/or warrant a modification of the Proposed Action in a manner or to an extent not previously considered: Analysis could consider a broader potential range of operations and/or different confidence in likelihood of effects from operations.

The criteria for identification of a special study in the Proposed Action balances uncertainty and flexibility. Reclamation would not rely on uncertain outcomes from a study but may require direct or incidental take to conduct the study. Requiring modifications to this Proposed Action to change special studies may impose unnecessary administrative delays or risk an unnecessary need for reinitiation of consultation.

No special studies were identified that met these criteria. Special studies may tier from the LTO.

12.4 Relationship to ESA Section 7 Consultation

The Code of Federal Regulations at 50 CFR § 402.16 describe the process for reinitiating ESA section 7 consultation. Specifically, reinitiation is required and shall be requested by the Federal action agency (in this case, Reclamation) or by the USFWS or NMFS (depending on which species are involved) if any one or more of several criteria are met. Although, there is no regulatory mechanism to modify ESA section 7 biological opinions absent reinitiating the section 7 consultation, there are options to improve understanding or modify an action without reinitiating the section 7 consultation so long as doing so does not meet a reinitiation trigger. Specifically, new information or a change in the proposed action would require reinitiation of consultation if:

1. new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; or

2. the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence.

Therefore, the additional objectives of this Program, as it pertains to ESA section 7 consultation, are to:

1. identify the areas of potential action uncertainty and the range of effects to species that may occur as the Adaptive Management Plan (AMP) is implemented such that the potential range of effects of the action may be considered; reinitiation will be required if that range of anticipated effects is exceeded; and

2. provide the mechanism for regular inquiries and evaluation to determine if reinitiation is required as the AMP is implemented.

In the event that a change is required to the Incidental Take Statement (ITS), and the change is fully consistent with the analysis in the biological opinion, the Services can revise the ITS without reinitiating the consultation. Examples include where new information allows for a more specific take surrogate, reduction in the amount or extent of take (which would include surrogates), or for clarification of the terms and conditions. Under these scenarios, the Services would issue a new ITS to the Federal action agency.