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Central Valley Project: Issues and Legislation

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Central Valley Project: Issues and Legislation

The Central Valley Project (CVP), a federal water project owned and operated by the U.S. Bureau of Reclamation (Reclamation), is one of the world's largest water supply projects. The CVP covers approximately 400 miles in California, from Redding to Bakersfield, and draws from two large river basins: the Sacramento and the San Joaquin. It is composed of 20 dams and reservoirs and numerous pieces of water storage and conveyance infrastructure. In an average year, the CVP delivers more than 7 million acre-feet of water to support irrigated agriculture, municipalities, and fish and wildlife needs, among other purposes. About 75% of CVP water is used for agricultural irrigation, including 7 of California's top 10 agricultural counties. The CVP is operated jointly with the State Water Project (SWP), which provides much of its water to municipal users in Southern California.

CVP water is delivered to users that have contracts with Reclamation, which is part of the Department of the Interior. These contractors receive varying levels of priority for water deliveries based on several factors, including hydrology, water rights, prior agreements with Reclamation, and regulatory requirements. The Sacramento and San Joaquin Rivers' confluence with the San Francisco Bay (*Bay-Delta* or *Delta*) is a hub for CVP water deliveries; many CVP contractors south of the Delta receive water that is "exported" from north of the Delta.

Development of the CVP resulted in significant changes to the area's natural hydrology. However, construction of most CVP facilities predated major federal natural resources and environmental protection laws. Much of the current debate related to the CVP revolves around how to deal with changes to the hydrologic system that were not significantly mitigated when the project was constructed. Dry conditions have led to significant curtailments of contracted water supplies in recent years. Reclamation has been unable to provide any water supplies to most CVP agricultural water service contractors in 4 of the past 11 years (including 2021 and 2022) and has cut supplies for some senior water rights holders during this time. Wet conditions in the winter of 2022-2023 alleviated some of these trends.

Various state and federal proposals are currently under consideration and have generated controversy for their potential to affect CVP operations and allocations. In late 2018, the State of California finalized revisions to its Bay-Delta Water Quality Control Plan that would require more flows from the San Joaquin and Sacramento Rivers to reach the Bay-Delta for water quality and fish and wildlife enhancement (i.e., reduced water supplies for other users). *Voluntary agreements* that might replace some or all of these requirements are being negotiated but have not been finalized. The Trump Administration attempted to increase CVP water supplies for users and proposed changes to long-term operations of the CVP in 2019. Those changes were finalized in a record of decision in 2020 after the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) issued a no-jeopardy biological opinion after consultation required by the Endangered Species Act (ESA; 16 U.S.C. §§1531-1544). California and some environmental organizations opposed these efforts and filed lawsuits to prevent implementation of the changes. The court issued a preliminary injunction on May 11, 2020, temporarily prohibiting Reclamation from implementing the operational changes. Under the Biden Administration, Reclamation is implementing an interim operations plan for the CVP while the litigation is pending and has requested reinitiation of consultation with FWS and NMFS to assess the effects of proposed changes to CVP operations.

Congress has engaged in CVP issues through oversight and legislation, most recently in the form of provisions enacted under the 2016 Water Infrastructure Improvements for the Nation Act (WIIN Act; P.L. 114-322). Among other things, this act authorized changes to CVP operations that were intended to provide increased water supplies for agricultural and municipal contractors under certain circumstances (most of these provisions have since expired). In the same legislation, Congress authorized funding for new water storage projects that are expected to benefit CVP operations. Some of these operational and construction-related provisions expired but have been proposed for reauthorization. Legislators may conduct oversight on the CVP and may consider legislation that aims to alter CVP water exports compared with current levels, as well as whether to approve funding for new water storage projects.

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Introduction

The Bureau of Reclamation (Reclamation), part of the Department of the Interior (DOI), operates the multipurpose federal Central Valley Project (CVP) in California, one of the world's largest water storage and conveyance systems. The CVP runs approximately 400 miles in California, from Redding to Bakersfield (**Figure 1**). It supplies water to hundreds of thousands of acres of irrigated agriculture throughout the state, including some of the most valuable cropland in the country. It also provides water to selected state and federal wildlife refuges, as well as to some municipal and industrial (M&I) water users. The CVP's operations are coordinated with the state's other largest water supply project, the state-operated State Water Project (SWP).

This report provides information on hydrologic conditions in California and their impact on state and federal water management, with a focus on deliveries related to the federal CVP. It also summarizes selected issues for Congress related to the CVP.

Recent Developments

California's water supplies are highly variable, with extended drought often followed by extremely wet years. The drought of 2012-2016, widely considered to be among California's most severe droughts in recent history, resulted in major reductions to CVP contractor allocations and economic and environmental impacts throughout the state.¹ The wet winter of 2017 temporarily alleviated those conditions, but October 2019 through September 2022 was the driest three water year period on record since 1977 and resulted in renewed water delivery curtailments and attention on California's constrained water supplies.² The winter of 2022-2023 significantly improved the state's hydrology, but many point to the likelihood of longer-term trends of reduced water availability as posing an ongoing challenge to federal operation of the CVP. How to deal with both short- and long-term drought in the context of the CVP is among the issues confronting policymakers.

Due to the limited available water supplies, proposed changes to current water operations and allocations associated with the CVP are controversial. Because of the relative scarcity of water in the West and the importance of federal water infrastructure to the region, western water issues are regularly of interest to many lawmakers. Legislation enacted in the 114th Congress (Title II of the Water Infrastructure Improvements for the Nation [WIIN] Act; P.L. 114-322) included several CVP-related sections.³ These provisions directed pumping to "maximize" water supplies for the CVP (including pumping or "exports" to CVP water users south of the Sacramento and San Joaquin Rivers' confluence with the San Francisco Bay, known as the *Bay-Delta* or *Delta*) in accordance with applicable biological opinions (BiOps) for project operations.⁴ They also

¹ For more information on drought in general, see CRS Report R46911, *Drought in the United States: Science, Policy, and Selected Federal Authorities*, coordinated by Charles V. Stern and Eva Lipiec.

² A *water year* is a hydrologic unit for measuring a 12-month total for which precipitation totals are measured. In California, the water year typically is measured from October 1 of one year to September 30 of the following year.

³ For more information, see CRS Report R44986, *Water Infrastructure Improvements for the Nation (WIIN) Act: Bureau of Reclamation and California Water Provisions*, by Charles V. Stern, Pervaze A. Sheikh, and Nicole T. Carter.

⁴ The Endangered Species Act (ESA) requires that a federal agency proposing an action that may have an effect on a listed species consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service (i.e., regulatory agencies). The action agency will commonly complete a biological assessment on potential effects to the fish or its habitat and submit it to the regulatory agency. The regulatory agency then renders a biological opinion, or BiOp, to the action agency making the proposal. The intent of a BiOp is to ensure that the proposed action will not reduce the likelihood of survival and recovery of an ESA-listed species. BiOps typically include conservation recommendations (continued...)

allowed for increased pumping during certain storm events generating high flows, authorized actions to facilitate water transfers, and established a new standard for measuring the effects of water operations on species. In addition to operational provisions, the WIIN Act authorized funding for construction of new federal and nonfederal water storage projects. CVP projects are among the most likely recipients of this funding.

Due to increased precipitation and disagreements with the state, among other factors, the WIIN Act's operational authorities generally did not yield significant new water exports south of the Delta in 2017-2020. Congress has appropriated funding for WIIN Act-authorized water storage project design and construction, and the majority of this funding has gone to CVP-related projects.

State and federal plans under the Clean Water Act (CWA) and the Endangered Species Act (ESA), respectively, would alter water allocation and operational criteria in markedly different ways and have generated controversy. In mid-2018, the State of California proposed revisions to its Bay-Delta Water Quality Control Plan (developed pursuant to the CWA [33 U.S.C. §§1251-138]). These changes, which have yet to be implemented, would require that more flows from the San Joaquin and Sacramento Rivers reach the California Bay-Delta for water quality and fish and wildlife enhancement (and would thus further reduce water supplies for CVP and SWP users). Actions pursuant to *voluntary agreements* with the state could alter and/or replace some of these requirements. Separately, in February 2020, the Trump Administration finalized an associated operations plan to increase water supplies for south-of-Delta (SOD) CVP users after issuing a new BiOp under the ESA (16 U.S.C. §§1531-1544). The BiOp was challenged in court, and to date it has not been formally implemented. The Biden Administration reviewed and revised the plan, and on September 30, 2021, Reclamation requested reinitiation of consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) under Section 7 of the ESA.

In the meantime, Reclamation and California have been operating the CVP and SWP pursuant to an interim operations plan (IOP) that includes selected elements of the 2019 BiOp and other plans. The initial IOP was implemented during the 2022 water year pursuant to a court order. At the request of the parties, the court issued implementation of a revised IOP, referred to as the IOP Extension, for the 2023 water year through December 31, 2023, which was further extended to March 31, 2024. In December 2023, the federal and state parties requested that the court extend the IOP again, with certain minor adjustments from the IOP Extension, until either December 20, 2024, or the new record of decision (ROD) is issued—whichever happens first.⁵

Background

California's Central Valley encompasses almost 20,000 square miles in the center of the state (**Figure 1**). It is bound by the Cascade Range to the north, the Sierra Nevada to the east, the Tehachapi Mountains to the south, and the Coast Ranges and San Francisco Bay to the west. The northern third of the valley is drained by the Sacramento River, and the southern two-thirds of the valley are drained by the San Joaquin River. Historically, this area was home to significant fish and wildlife populations.

The CVP was originally conceived as a state project; the state studied the project as early as 1921, and the California state legislature formally authorized it for construction in 1933. After it became

intended to further recovery of the ESA-listed species. For more information, see CRS Report R46677, *The Endangered Species Act: Overview and Implementation*, by Pervaze A. Sheikh, Erin H. Ward, and R. Eliot Crafton.

⁵ For more information, see below section, "Biological Opinion Consultation and Legal Activity."

clear that the state was unable to finance the project, the federal government (through the U.S. Army Corps of Engineers, or USACE) assumed control of the CVP as a public works construction project under authority provided under the Rivers and Harbors Act of 1935.⁶ The Franklin D. Roosevelt Administration subsequently transferred the project to Reclamation.⁷ Construction on the first unit of the CVP (Contra Costa Canal) began in October 1937, with water first delivered in 1940. Additional CVP units were completed over time, and some USACE-constructed units have also been incorporated into the project.⁸ The New Melones Unit was the last unit of the CVP to come online; it was completed in 1978 and began operations in 1979.

The CVP made significant changes to California's natural hydrology to develop water supplies for irrigated agriculture, municipalities, and hydropower, among other things. Most of the CVP's major units, however, predated major federal natural resources and environmental protection laws such as ESA and the National Environmental Policy Act (NEPA; 42 U.S.C. §§4321 et seq.), among others. Thus, much of the current debate surrounding the project revolves around how to address the project's changes to California's hydrologic system that were not major considerations when it was constructed.

Today, CVP water serves a variety of different purposes for both human uses and fish and wildlife needs. The CVP provides a major source of support for California agriculture, which is first in the nation in terms of farm receipts.⁹ CVP water supplies irrigate more than 3 million acres of land in central California and support 7 of California's top 10 agricultural counties. In addition, CVP M&I water provides supplies for approximately 2.5 million people per year. CVP operations are also critical for hydropower, recreation, and fish and wildlife protection. In addition to fisheries habitat, CVP flows support wetlands, which provide habitat for migrating birds.

Overview of the CVP and California Water Infrastructure

California's water infrastructure (**Figure 1**)—which includes an extensive interconnected network of federal, state, local, and private facilities that move water over hundreds of miles around the state—is one of the most complex systems of its kind in the world. Numerous entities throughout the state, including major agricultural and urban economies, as well as a wide variety of terrestrial and aquatic species, depend on the operational decisions underpinning these facilities. As a result, water users and other organizations are often in conflict regarding the decisions related to where and to whom water is delivered, when it is available, and in what quantity. Short- and long-term periods of water scarcity in the state exacerbate these conflicts, many of which have been ongoing on for decades.

The CVP is the largest federal water project in the country. It encompasses 20 dams and reservoirs, 11 power plants, and 500 miles of canals, as well as numerous other conduits, tunnels,

⁶ 49 Stat. 1028.

⁷ Transfer of the project to Reclamation was pursuant to a presidential directive in 1935 and subsequent congressional enactment of the Rivers and Harbors Act of 1937 (50 Stat. 844, 850).

⁸ Although Reclamation constructed much of the Central Valley Project (CVP) and maintains control over its operations, the U.S. Army Corps of Engineers (USACE) has also been involved in the project over the course of its history. Some dams, such as Folsom Dam and New Melones Dam, initially were built by USACE but have been turned over to Reclamation for operations and maintenance and incorporated into the CVP. Additionally, USACE constructed and continues to operate several major dams in and around the Central Valley for flood control and other purposes, including Terminus Dam, Isabella Dam, Pine Flat Dam, and Success Dam in the San Joaquin Valley. Since USACE operates these dams for flood control, Reclamation administers contracts to use surplus water from these reservoirs for irrigation.

⁹ U.S. Department of Agriculture, Economic Research Service, *Cash Receipts by State, Commodity Ranking and Share of U.S. Total, 2021*, at <https://data.ers.usda.gov/reports.aspx?ID=17844>.

and storage and distribution facilities.¹⁰ In an average year, it delivers approximately 5 million acre-feet (AF) of water to farms (including some of the nation's most valuable farmland); 600,000 AF to M&I users; 410,000 AF to wildlife refuges; and 800,000 AF for other fish and wildlife needs, among other purposes. A separate major project owned and operated by the State of California, the SWP, draws water from many of the same sources as the CVP and coordinates its operations with the CVP under several agreements. In contrast to the CVP, the SWP delivers about 70% of its water to urban users (including water for approximately 25 million users in the San Francisco Bay, Central Valley, and Southern California); the remaining 30% is used for irrigation.

At their confluence, the Sacramento and San Joaquin Rivers flow into the San Francisco Bay (the Bay-Delta, or Delta). Operation of the CVP and SWP occurs through the storage, pumping, and conveyance of significant volumes of water from both river basins (as well as trans-basin diversions from the Trinity River Basin in Northern California) for delivery to users. Federal and state pumping facilities in the Delta near Tracy, CA, export water from Northern California to Central and Southern California and are a hub for CVP operations and related debates. In the context of these controversies, *north of Delta* (NOD) and *south of Delta* (SOD) are important categorical distinctions for water users.

CVP storage is spread throughout Northern and Central California. The largest CVP storage facility is Shasta Dam and Reservoir in Northern California (**Figure 2**), which has a capacity of 4.5 million AF. Other major storage facilities, from north to south, include Trinity Dam and Reservoir (2.4 million AF), Folsom Dam and Reservoir (977,000 AF), New Melones Dam and Reservoir (2.4 million AF), Friant Dam and Reservoir (520,000 AF), and San Luis Dam and Reservoir (1.8 million AF of storage, of which half is federal and half is nonfederal).

The CVP also includes numerous water conveyance facilities, the longest of which are the Delta-Mendota Canal (which runs for 117 miles from the federally operated Bill Jones pumping plant in the Bay-Delta to the San Joaquin River near Madera) and the Friant-Kern Canal (which runs 152 miles from Friant Dam to the Kern River near Bakersfield).

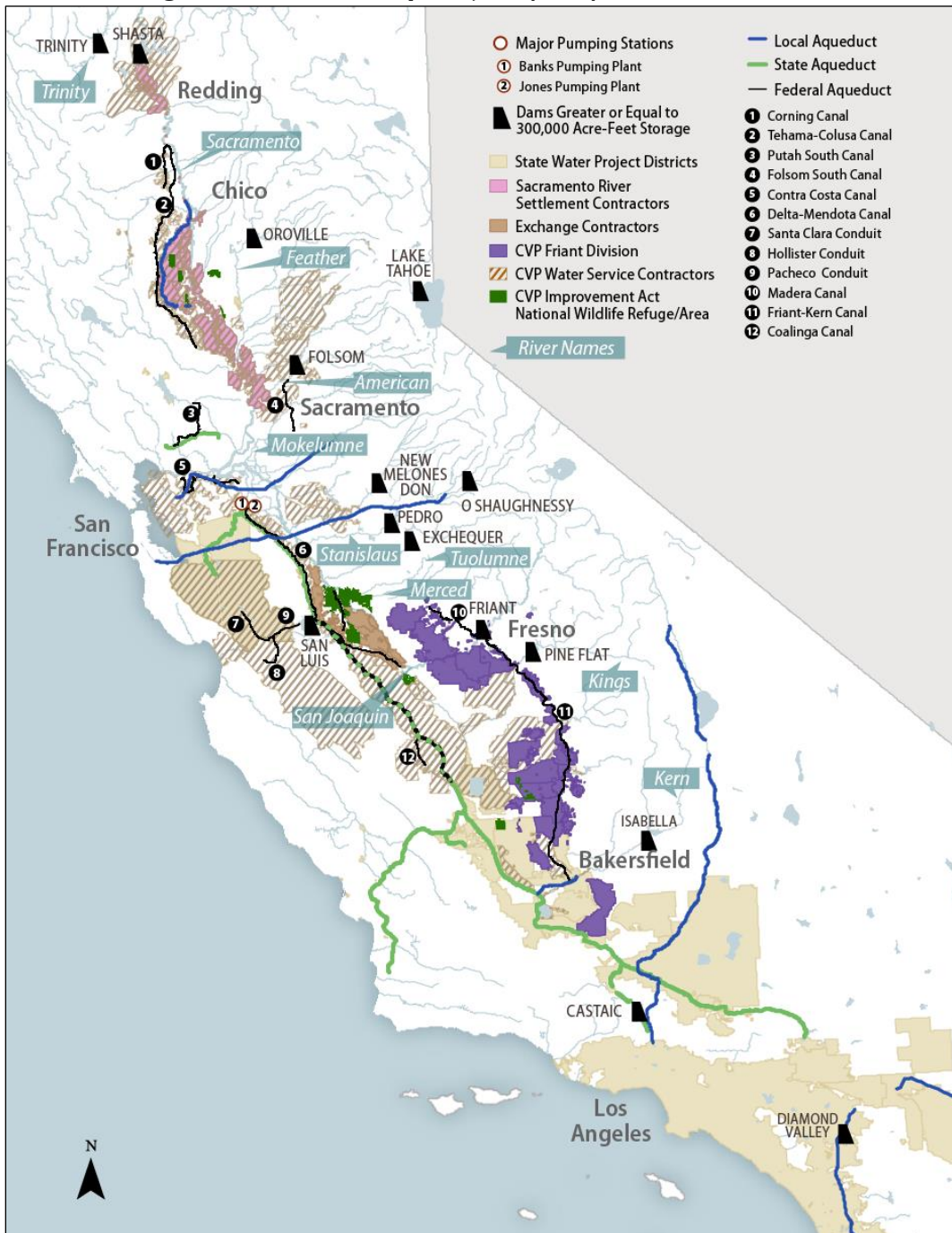
Non-CVP water storage and infrastructure is also spread throughout the Central Valley and in some cases is integrated with CVP operations. Major non-CVP storage infrastructure in the Central Valley includes multiple storage projects that are part of the SWP (the largest of which is Oroville Dam and Reservoir in Northern California), as well as private storage facilities (e.g., Don Pedro and Exchequer Dams and Reservoirs) and local government-owned dams and infrastructure (e.g., O'Shaughnessy Dam and Hetch-Hetchy Reservoir and Aqueduct, which are owned by the San Francisco Public Utilities Commission).

In addition to its importance for agricultural water supplies, California's Central Valley also provides valuable wetland habitat for migratory birds and other species. As such, it is home to multiple state, federal, and private wildlife refuges north and south of the Delta. Nineteen of these refuges (including 12 refuges within the National Wildlife Refuge system, 6 State Wildlife Areas/Units, and 1 privately managed complex) provide managed wetland habitat that receives water from the CVP and other sources. Five of these units are located in the Sacramento River Basin (i.e., NOD), 12 are in the San Joaquin River Basin, and the remaining 2 are in the Tulare Lake Basin.¹¹

¹⁰ Bureau of Reclamation, "About the Central Valley Project," at <http://www.usbr.gov/mp/cvp/about-cvp.html>.

¹¹ Tulare Lake, a freshwater dry lake in the San Joaquin River Valley, historically was one of the largest freshwater lakes west of the Great Lakes. Under most normal (nonflood) conditions, the lake was *terminal*, meaning it had no (continued...)

Figure I. Central Valley Project (CVP) and Related Facilities



Source: Prepared by CRS based on data from the U.S. Bureau of Reclamation; California Spatial Information Library; Census Bureau TIGER/Line data files; and ESRI Community Data, 2008.

Notes: Colored areas are based on water and irrigation district boundaries and do not correspond to the amount of water delivered from the CVP or the State Water Project. For example, some large areas have relatively small contracts for water compared with other, smaller areas.

outlet and did not drain downstream. Damming in the mid-20th century by the USACE of the Kaweah (Terminus Dam), Kern (Isabella Dam), Kings (Pine Flat Dam), and Tule Rivers (Success Dam), coupled with development of the basin for irrigated agriculture, dried up the lake bed under most conditions.

Figure 2. Shasta Dam and Reservoir

Source: Bureau of Reclamation.

Central Valley Project Water Contractors and Allocations

Historically, snowpack has accounted for approximately 30% of California’s water supplies and is an important factor in determining CVP and SWP allocations. Water from snowpack typically melts in the spring and early summer, and it is stored and made available to meet water needs throughout the state in the summer and fall.¹² By late winter, the state’s water supply outlook is typically sufficient for Reclamation to issue the amount of water it expects to deliver to its contractors.¹³ At that time, Reclamation announces estimated deliveries for its 250 CVP water contractors in the upcoming water year.

More than 9.5 million AF of water per year is *potentially* available from the CVP for delivery based on contracts between Reclamation and CVP contractors.¹⁴ However, most CVP water contracts provide exceptions for Reclamation to reduce water deliveries due to hydrologic conditions and other conditions outside Reclamation’s control.¹⁵ As a result of these stipulations, Reclamation rarely delivers the full amount of contracted water to CVP users, and regularly makes cutbacks to actual CVP water deliveries to contractors due to drought and other factors.

¹² For additional discussion on efforts to supplement existing storage, see below section, “New Storage and Conveyance.”

¹³ A *water contractor*, as described in this report, has a contract for specified water deliveries from conveyance structures managed by the U.S. Bureau of Reclamation. Reclamation typically estimates these deliveries as a percentage of the total contract allocation to be made available for contractors within certain divisions, geographic areas, and/or contractor types (e.g., south-of-Delta agricultural contractors).

¹⁴ Water service contracts charge users a per-acre-foot rate based on the amount of water delivered. In contrast, repayment contracts (the most common type of Reclamation contract outside of the CVP) charge users based on the amount of water storage allocated to a contractor, among other things.

¹⁵ See U.S. Bureau of Reclamation, Mid-Pacific Region, *Final Form of Contract, 4-19-2004*, Articles 3b, 11, 12a, and 12b, at http://www.usbr.gov/mp/cvpia/3404c/lt_contracts/index.html.

Reclamation typically forecasts the amount of CVP water expected to be made available to various contractors during the water year (i.e., October-September) in terms of a percentage of the total contract supply. Reclamation also has a specific policy for those contracted to receive M&I water supplies from the CVP, whereby during times of shortage (i.e., any time in which full contract quantities cannot be delivered), these contractors are allocated water in terms of a percentage of their M&I historical use or the amount needed for public health and safety needs, whichever is greater.¹⁶

Since the early 1980s, an average of about 7 million AF of water has been made available to CVP contractors annually (including 5 million AF to agricultural contractors). However, during drought years deliveries may be significantly less. In the extremely dry water years of 2012-2015, CVP annual deliveries averaged approximately 3.45 million AF.¹⁷

CVP contractors receive varying levels of priority for water deliveries based on their water rights and other related factors, and some of the largest and most prominent water contractors have a relatively low allocation priority. Major groups of CVP contractors include *water rights* contractors (i.e., senior water rights holders such as the Sacramento River Settlement and San Joaquin River Exchange Contractors, see text box below), NOD and SOD water service and repayment contractors, and Central Valley refuge water contractors. The relative locations for these groups are shown in **Figure 1**.

Water Rights Contractors

California's system of state water rights has a profound effect on who gets how much water and when, particularly during times of drought or other restrictions on water supply. Because the waters of California are considered to be "the property of the people of the State," anyone wishing to use those waters must acquire a right to do so. California follows a dual system of water rights, recognizing both the riparian and prior appropriation doctrines. Under the riparian doctrine, a person who owns land that borders a watercourse has the right to make reasonable use of the water on that land (riparian rights). Riparian rights are reduced proportionally during times of shortage. Under the prior appropriation doctrine, a person who diverts water from a watercourse (regardless of his location relative thereto) and makes reasonable and beneficial use of the water acquires a right to that use of the water (appropriated rights). Appropriated rights are filled in order of seniority during times of shortage. Before exercising the right to use the water, appropriative users must obtain permission from the state through a permit system run by the State Water Resources Control Board (SWRCB).

Both the Central Valley Project (CVP) and the State Water Project (SWP) acquired rights for water use from the State of California, receiving several permits for water diversions at various points between 1927 and 1967. Since the Bureau of Reclamation found it necessary to take the water rights of other users to construct the CVP, it entered into *settlement contracts* (north and south of the Delta) and *exchange contracts* (south of the Delta only) with water users who had rights predating the CVP (and thus were senior users in time and right). Many of these special contracts were entered into in areas where water users were diverting water directly from the Sacramento and San Joaquin Rivers.

Sacramento River Settlement Contractors include the contractors (both individuals and districts) that diverted natural flows from the Sacramento River prior to the CVP's construction and executed a settlement agreement with Reclamation that provided for negotiated allocation of water rights (there is also a small group of settlement contractors south of the Delta who entered similar agreements). San Joaquin River Exchange Contractors are the irrigation districts that agreed to "exchange" exercising their water rights to divert water on the San Joaquin and Kings Rivers for guaranteed water deliveries from the CVP (typically in the form of deliveries from the Delta-Mendota Canal and waters north of the Delta). In contrast to water service contractors, water rights contractors receive 100% of their contracted amounts in most water-year types. During water shortages (typically designated as "critical years" based on inflows to Lake Shasta), their annual maximum entitlement may be reduced.

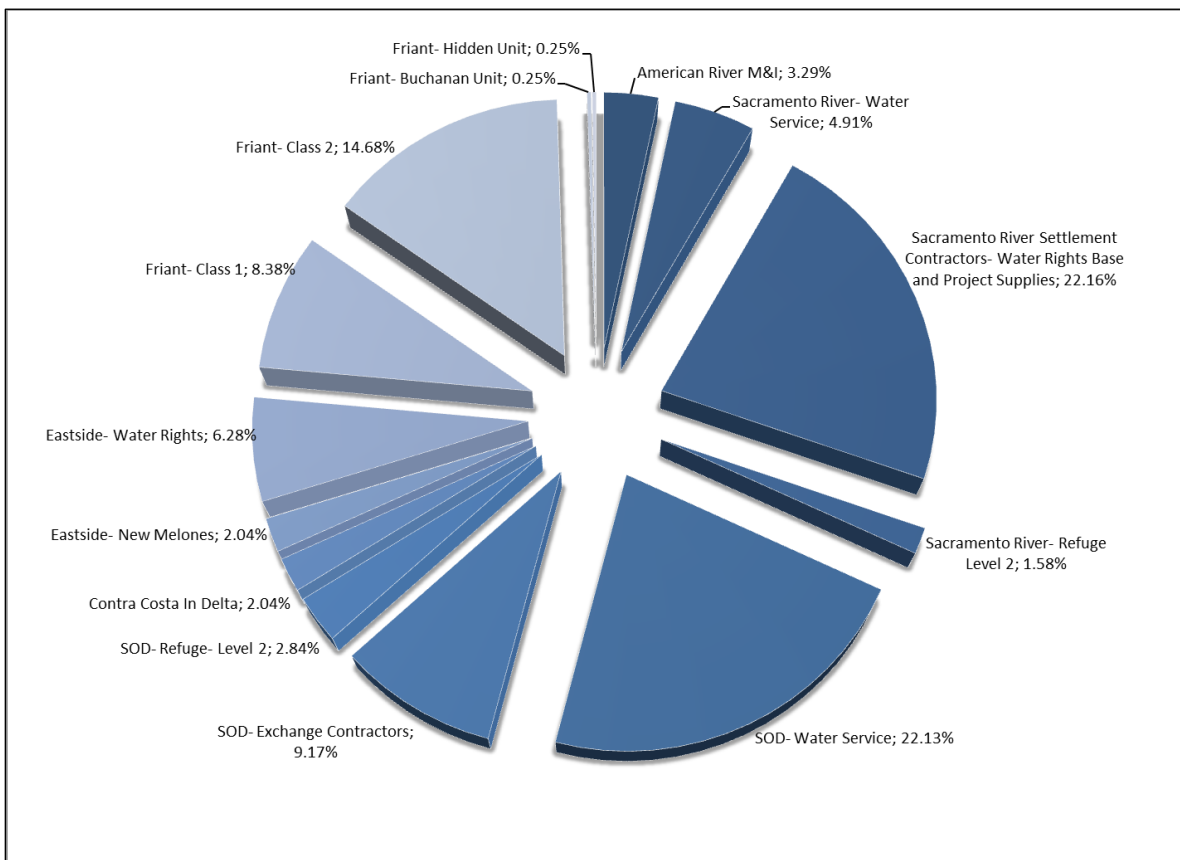
¹⁶ Bureau of Reclamation, *Central Valley Project Municipal and Industrial Water Shortage Policy Guidelines and Procedures*, Effective February 1, 2017, at <https://www.usbr.gov/mp/cvp/mandi.html>.

¹⁷ CRS analysis of CVP contract water delivery information by the Bureau of Reclamation, October 3, 2018.

The largest contract holders of CVP water by percentage of total contracted amounts are Sacramento River Settlement Contractors, located on the Sacramento River. The second-largest group are SOD water service contractors (including Westlands Water District, the CVP’s largest contractor), located in the area south of the Delta. Other major contractors include the San Joaquin River Exchange Contractors, located west of the San Joaquin River, and Friant Division contractors, located on the east side of the San Joaquin Valley. Central Valley refuges and several smaller contractor groups (e.g., Eastside Contracts, In-Delta-Contra Costa Contracts, and SOD Settlement Contracts) also factor into CVP water allocation discussions.¹⁸

Figure 3 depicts an approximate division of *maximum* available CVP water deliveries for major contractor groups based on 2018 data. Some of these groups and their relative delivery priority are discussed in more detail in the **Appendix** to this report.

Figure 3. Central Valley Project (CVP): Maximum Contract Amounts
(relative share of total maximum contracted CVP supplies)



Source: CRS, using Bureau of Reclamation contractor data as of 2018.

Notes: SOD = South of Delta; M&I = municipal and industrial water service contractors. Sacramento River Settlement Contractors includes both “base” water rights supplies (18.6%) and additional CVP “project” supplies (3.5%). For SOD Refuges, chart does not reflect “Level 4” supplies (for more information on Level 4 supplies, see below section, “Central Valley Wildlife Refuges”).

¹⁸ Central Valley Project refuges are discussed more in the below section, “Central Valley Project Improvement Act.”

CVP Allocations

Reclamation announced its initial allocations for the 2024 water year in February 2024;¹⁹ these allocations were subsequently revised based on updated hydrology.²⁰ Based on forecasted inflow to Shasta Lake, Reclamation designated the 2024 water year as *noncritical*.²¹

Table 1, below, shows recent CVP allocations. Senior water rights contractors and some refuges were initially allocated 100% of their maximum contract allocations in 2024, while other contractors were allocated lesser amounts. Reclamation allocated NOD and SOD agricultural water service and repayment contractors 75% and 15% of their contracted supplies, respectively, in February 2024 but subsequently increased these allocations to 100% and 35% in March and further increased the SOD contractor allocation to 40% in April.²² SOD contractors have received their full contract allocations five times since 1990: 1995, 1998, 2006, 2017, and 2023.²³ Reclamation also increased allocations for Friant Class 1 contractors, from 60% in the initial allocation to 95% in late March 2024.²⁴

State Water Project Allocations

The other major water project serving California, the SWP, is operated by California's Department of Water Resources (DWR). The SWP primarily provides water to M&I users and some agricultural users, and it integrates its operations with the CVP. Similar to the CVP, the SWP has more contracted entitlements than it typically makes available in its deliveries. SWP contracted entitlements are 4.17 million AF, but annual deliveries are less than that amount, considerably in some years.

SWP water deliveries were historically low in 2014 and 2015, before rebounding to significantly higher levels in the wet year of 2017. Due to drought in 2021 and 2022, allocations again fell to historically low levels.²⁵ SWP water supply allocations for water years 2013-2024 are shown in **Table 2**. Similar to the CVP, the state updates these allocations as hydrology and other conditions warrant.

¹⁹ Bureau of Reclamation, "Reclamation Announces Initial 2024 Water Supply Allocations for Central Valley Project Contractors," press release, February 21, 2024, at <https://www.usbr.gov/newsroom/news-release/4743?filterBy=region®ion=California-Great%20Basin>. Hereinafter, Reclamation, Initial 2024 Allocations.

²⁰ Bureau of Reclamation, "Reclamation Increases 2024 Central Valley Project Water Supply Allocations," press release, March 22, 2024, at <https://www.usbr.gov/newsroom/news-release/4782>. Hereinafter, Reclamation, Revised 2024 Allocations.

²¹ A *Shasta critical year* is defined as a year in which inflows into Lake Shasta are forecasted to be at or below 3.2 MAF. This designation triggers specific (reduced) allocations for some contractors and refuges.

²² Reclamation, Initial 2024 Allocations and Revised 2024 Allocations.

²³ Bureau of Reclamation, "Summary of Water Supply Allocations," at http://www.usbr.gov/mp/cvo/vungvari/water_allocations_historical.pdf.

²⁴ Daniel Gligich, "Feds Boost Friant Division Water Allocation," *San Joaquin Valley Sun*, April 1, 2024, <https://sjvsun.com/ag/feds-boost-friant-division-water-allocation/>.

²⁵ California Department of Water Resources, "State Water Project Historical Table A Allocations, 1996-2024," at <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/Historical-SWP-allocations-1996-2024-022124.pdf>.

Table 1. Central Valley Project (CVP) Contractor Water Allocations by Water Year, 2013-2024

(percentage of maximum contract allocation made available)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
North-of-Delta Users												
Agricultural	75%	0%	0%	100%	100%	100%	100%	50%	5%	0%	100%	100%
M&I	100%	50%	25%	100%	100%	100%	100%	75%	25%	5%	100%	100%
Settlement Contractors	100%	75%	75%	100%	100%	100%	100%	100%	75%	18%	100%	100%
Refuges (Level 2)	100%	75%	75%	100%	100%	100%	100%	100%	75%	18%	100%	100%
American River M&I	75%	50%	25%	100%	100%	100%	100%	75%	55%	15%	100%	100%
In Delta: Contra Costa (M&I)	75%	50%	25%	100%	100%	100%	100%	75%	55%	33%	100%	100%
South-of-Delta Users												
Agricultural	20%	0%	0%	5%	100%	50%	75%	20%	0%	0%	100%	40%
M&I	70%	50%	25%	55%	100%	75%	100%	70%	25%	33%	100%	75%
Exchange/Settlement Contractors	100%	65%	75%	100%	100%	100%	100%	100%	75%	75%	100%	100%
Refuges (Level 2)	100%	65%	75%	100%	100%	100%	100%	100%	75%	75%	100%	100%
Eastside Division	100%	55%	0%	0%	100%	100%	100%	100%	100%	0%	100%	100%
Friant Class I	62%	0%	0%	65%	100%	88%	100%	65%	40%	30%	100%	95%
Friant Class 2	0%	0%	0%	13%	100%	9%	^a	0%	0%	0%	70%	0%

Sources: U.S. Bureau of Reclamation, CVP Historical Water Supply Allocations, at <https://usbr.gov/mp/cvp-water/allocations.html>.

Notes: Reflects updates from initial water supply allocations. M&I = municipal and industrial water contractors. Water years refer to the period from October 1 to September 30. In times of shortage, M&I contractor allocations typically reference a percentage in terms of historic use (or public health and safety needs, whichever is greater).

a. “Uncontrolled” Class 2 releases for Friant Contractors were available through June 30, 2019.

Table 2. California State Water Project Allocations by Water Year, 2013-2024
(percentage of maximum contract allocation)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Allocation	35%	5%	20%	60%	85%	35%	75%	20%	5%	5%	100%	40%

Source: California Department of Water Resources, “Notices to State Water Project Contractors,” at <https://water.ca.gov/Programs/State-Water-Project/Management/SWP-Water-Contractors>.

Combined CVP/SWP Operations

The CVP and SWP are operated in conjunction under the 1986 Coordinated Operations Agreement (COA), which was executed pursuant to P.L. 99-546.²⁶ COA defines the rights and responsibilities of the CVP and SWP with respect to in-basin water needs and provides a mechanism to account for those rights and responsibilities. Several major changes to California water supply allocations that occurred since 1986 (e.g., water delivery reductions pursuant to the Central Valley Project Improvement Act [CVPIA], ESA requirements, and new Delta Water Quality Standards, among other things) caused some to argue for renegotiation of the agreement’s terms.²⁷ Dating to 2015, Reclamation and DWR conducted a mutual review of COA but did not agree on revisions. On August 17, 2018, Reclamation provided a Notice of Negotiations to DWR.²⁸ Following negotiations in fall 2018, Reclamation and DWR agreed to an addendum to COA in December 2018.²⁹ Whereas the original 1986 agreement included a fixed ratio of 75% CVP/25% SWP for the sharing of regulatory requirements associated with storage withdrawals for Sacramento Valley in-basin uses (e.g., curtailments for water quality and species uses), the revised addendum adjusted the ratio of sharing percentages based on water year types (**Table 3**).

The 2018 addendum also adjusted the sharing of export capacity under constrained conditions. Whereas under the 1986 COA, export capacity was shared evenly between the CVP and the SWP, under the revised COA the split is to be 60% CVP/40% SWP during excess conditions, and 65% CVP/35% SWP during balanced conditions.³⁰ Finally, the state also agreed in the 2018 revisions to transport up to 195,000 AF of CVP water through the SWP’s California Aqueduct during certain conditions. Recent disagreements related to CVP and SWP operational changes by the federal and state governments, in particular those operational changes to meet ESA requirements, have called into question the future of coordinated operations under COA.

²⁶ “Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and the State Water Project,” No. 7-07-20-WO551, November 24, 1986.

²⁷ For example, see Joint Letter to the Bureau of Reclamation from Placer County Water Agency, City of Folsom, Tehama-Colusa Canal Authority et al., March 1, 2016, at <http://www.ccwater.com/DocumentCenter/View/1854>. For more information on water delivery restrictions as they apply to the CVP, see “Constraints on CVP Deliveries.”

²⁸ Letter from David G. Murillo, Regional Directory, Bureau of Reclamation, to Karla Nemeth, Director, California Department of Water Resources, August 17, 2018.

²⁹ See Bureau of Reclamation and California Department of Water Resources, *Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project*, December 12, 2018.

³⁰ “Balanced” conditions refer to those conditions under which reservoir releases and unregulated flows in the Delta are equal to the water supply needed to meet Sacramento Valley in-basin uses plus exports. Excess conditions are periods in which releases and unregulated flows exceed the aforementioned uses.

Table 3. Coordinated Operations Agreement (COA) Regulatory Requirements for CVP/SWP In-Basin Storage Withdrawals
(requirements pursuant to 1986 and 2018 agreements)

Water Year Type	1986 COA	COA with 2018 Addendum
All	75% CVP, 25% SWP	NA
Wet & Above Normal	NA	80% CVP, 20% SWP
Below Normal	NA	75% CVP, 25% SWP
Dry	NA	65% CVP, 35% SWP
Critically Dry	NA	60% CVP, 40% SWP

Source: Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project, December 12, 2018.

CVP/SWP Exports

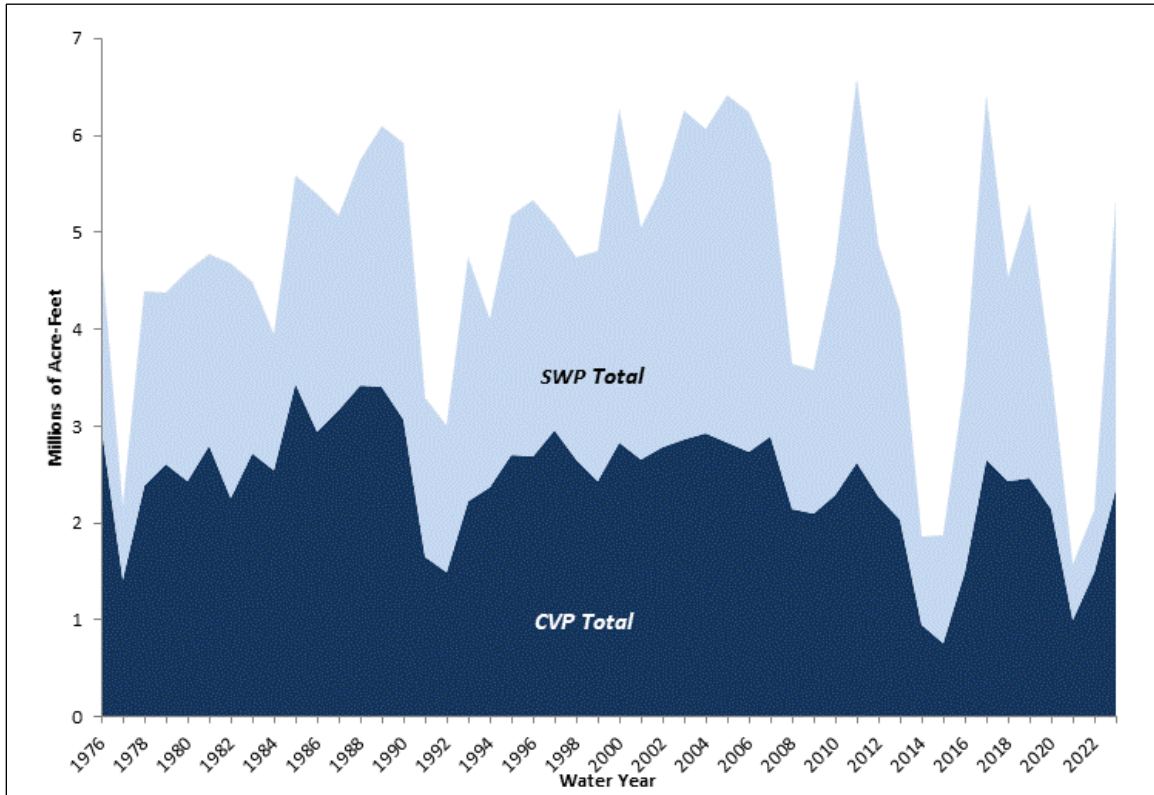
“Exports” reflect trends over time in the transfer of water from north to south of the Bay-Delta by the CVP and SWP, in particular through pumping. Combined CVP and SWP exports (i.e., water transferred from north to south of the Delta) is of interest to many observers because exports are important sources of water supply in central and southern CA. Exports of the CVP and SWP, as well as total combined exports since 1978, have varied over time (**Figure 4**). Combined exports dropped significantly during the 2012-2016 drought and rebounded in 2017-2018, before once again dropping during the most recent drought. Prior to the 2012-2016 drought, overall export levels had increased over time, having averaged more from 2001 to 2011 than over any previous 10-year period. The 6.42 million AF of combined exports in 2017 was the second most on record, behind 6.59 million AF in 2011. In 2023, exports totaled 5.34 million AF.

Despite the aforementioned trends, over time, CVP exports have decreased on average. Additionally, exports for agricultural purposes have declined as a subset of total exports, in part due to those exports being made available for other purposes (e.g., fish and wildlife purposes).

Constraints on CVP Deliveries

Concerns over CVP water supply deliveries persist in part because even in years with higher levels of precipitation and runoff, some contractors (in particular SOD water service contractors) have regularly received allocations of less than 100% of their contract supplies. Allocations for some users have declined over time; additional environmental requirements in recent decades have reduced water deliveries for human uses. Those factors, coupled with reduced water supplies available in drought years, have led some policymakers and stakeholders to increasingly focus on what can be done to increase water supplies for users. At the same time, others that depend on or advocate for the health of the San Francisco Bay and its tributaries, including fishing and environmental groups and water users throughout Northern California, have argued for maintaining or increasing existing environmental protections (the latter of which would likely further constrain CVP exports).

**Figure 4. Central Valley Project (CVP) and State Water Project (SWP) Exports
1976-2023**



Source: CRS, based on data provided by the U.S. Department of the Interior, Bureau of Reclamation, email communication, January 18, 2024, *Total Annual Pumping at Banks, Jones, and Contra Costa Pumping Plants 1976-2023 (MAF)*.

Hydrology and state water rights are the two primary drivers of CVP allocations. However, at least three other regulatory factors affect the timing and amount of water available for delivery to CVP contractors and are regularly the subject of controversy:

- State water quality requirements pursuant to state and federal water quality laws (including the CWA [33 U.S.C. §§1251 et seq.]
- Regulations and court orders pertaining to implementation of the federal ESA (P.L. 93-205, 16 U.S.C. §§1531-1544)³¹
- Implementation of the CVPIA (P.L. 102-575)³²

Each of these factors is discussed in more detail below.

³¹ Requirements of the California Endangered Species Act (CESA) currently are being satisfied through implementation of the federal ESA due to a California state determination that project operations under the federal biological opinions are consistent with requirements under CESA. Presumably, if protections afforded to threatened and endangered species under the federal ESA were no longer in place, the State of California could invoke protections under CESA.

³² P.L. 102-575, Title 34, 106 Stat. 4706.

Water Quality Requirements: Bay-Delta Water Quality Control Plan

California sets water quality standards and issues permits for the discharge of pollutants in compliance with the federal CWA, enacted in 1972.³³ Through the Porter-Cologne Act (a state law), California implements federal CWA requirements and authorizes the State Water Resources Control Board (State Water Board) to adopt water quality control plans, or basin plans.³⁴ The CVP and the SWP affect water quality in the Bay-Delta depending on how much freshwater the projects release into the area as “unimpaired flows” (thereby affecting area salinity levels).

The first Water Quality Control Plan for the Bay-Delta (Bay-Delta Plan) was issued by the State Water Board in 1978. Since then, there have been three substantive updates to the plan—in 1991, 1995, and 2006. The plans have generally required the SWP and CVP to meet certain water quality and flow objectives in the Delta to maintain desired salinity levels for in-Delta diversions (e.g., water quality levels for in-Delta water supplies) and fish and wildlife, among other things. These objectives often affect the amount and timing of water available to be pumped, or exported, from the Delta and thus at times result in reduced Delta exports to CVP and SWP water users south of the Delta.³⁵ The Bay-Delta Plan is currently implemented through the State Water Board’s Decision 1641 (or D-1641), which was issued in 1999 and placed responsibility for plan implementation on the state’s largest two water rights holders, Reclamation and the California DWR.³⁶

Pumping restrictions to meet state-set water quality levels—particularly increases in salinity levels—can sometimes be significant. However, the relative magnitude of these effects varies depending on hydrology. For instance, Reclamation estimated that in 2014, water quality restrictions accounted for 176,300 AF, which was roughly 10% of the long-term pumping average for CVP exports.³⁷

Bay-Delta Plan Update

Updates to the 2006 Bay-Delta Plan (i.e., the Bay-Delta Plan Update) are being carried out in two separate processes: one for the San Joaquin River and Southern Delta, and the other for the Sacramento River and tributaries north of the Delta.³⁸ In December 2018, the State Water Board adopted amendments to the 2006 Bay-Delta Plan establishing flow objectives and revised salinity

³³ The CWA requires the states to implement water quality standards that designate water uses to be protected and adopt water quality criteria that protect the designated uses. For application to California, see *United States v. State Water Resources Control Board (Racanelli)*, 182 Cal. App. 3d 82, 109 (Cal. Ct. App. 1986).

³⁴ See Cal. Water Code §13160.

³⁵ Inability to reach agreement on water quality objectives through deliberation and litigation nearly shut down Delta pumping in the early 1990s and was a significant factor in the creation of the Bay-Delta Accord—a partnership between federal and state agencies with projects, responsibilities, and activities affecting the Delta. Habitat protection commitments in the accord were incorporated into the Bay-Delta Water Quality Control Plan, as were actions called for under the Vernalis Adaptive Management Program, and were included by the State Water Board in D-1641. (See U.S. Department of the Interior (DOI), Bureau of Reclamation, Mid-Pacific Region, *Long-Term Central Valley Project Operations Criteria and Plan*, Sacramento, CA, May 22, 2008, pp. 2-6.)

³⁶ California Environmental Protection Agency, State Water Resources Control Board, “Revised Water Right Decision 1641,” March 15, 2000, at https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1641_1999dec29.pdf.

³⁷ Personal communication with the Bureau of Reclamation, October 15, 2015.

³⁸ For more information, see the State Water Resources Control Board Bay-Delta Plan update website at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/.

objectives for the Lower San Joaquin River and Southern Delta.³⁹ The San Joaquin portion of the Bay-Delta Plan Update requires additional flows to the ocean (generally referred to as *unimpaired flows*) from the San Joaquin River and its tributaries (i.e., the Stanislaus, Tuolumne, and Merced Rivers). Under the proposal, the unimpaired flow requirement for the San Joaquin River is approximately 40% (within a range of 30%-50%); average unimpaired flows currently range from 21% to 40%.⁴⁰ The state estimates that the updated version of the plan would reduce water available for human use from the San Joaquin River and its tributaries by between 7% and 23%, on average, depending on the water year type, but it could reduce these water supplies by as much as 38% during critically dry years.⁴¹ The state also is updating flow requirements on the Sacramento River and its tributaries, but a detailed plan has yet to be finalized.⁴² The conditions in the Bay-Delta Plan Update would be implemented through water rights conditions imposed by the State Water Board; originally, these conditions were to be implemented no later than 2022, but they have been delayed by litigation (see below for additional discussion).

According to the state, the Bay-Delta Plan Update establishes a “starting point” for increased river flows but also makes allowances for reduced flow requirements on tributaries where stakeholders have reached so-called *voluntary agreements* (see box below) to pursue both flow and “non-flow” measures, such as habitat restoration projects and funding.⁴³ Negotiations to finalize these agreements have been ongoing since prior to the passage of the first plan update amendments, and the negotiations involve the state and federal governments as well as numerous stakeholders. According to the State Water Board, if water users do not enter into voluntary agreements to implement the plan update, the board could eventually take actions to require their implementation, such as promulgation of regulations and conditioning of water rights.⁴⁴

³⁹ See California State Water Board, *Adoption of Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Final Substitute Environmental Document*, Resolution No. 2018-0059, December 12, 2018.

⁴⁰ California Water Boards, “State Water Board Seeks Public Comment on Final Draft Bay-Delta Plan Update for the Lower San Joaquin River and Southern Delta,” July 6, 2018, at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/Bay-Delta_Plan_Update_Press_Release.pdf.

⁴¹ California Water Boards, “Summary of Proposed Amendments to the Bay-Delta Water Quality Control Plan,” July 6, 2018, at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/sed/ljlr_sdqw_summary_070618.pdf. “Critically dry” years refers to a classification that is part of a broader index of water year types for the San Joaquin River; it is calculated based on runoff from the San Joaquin River and its tributaries. A similar index characterizes Sacramento River runoff.

⁴² A preliminary framework released by the state in July 2018 proposed a potential requirement of 55% unimpaired flows from the Sacramento River (within a range of 45% to 65%). See California Water Boards, “July 2018 Framework for the Sacramento/Delta Update to the Bay-Delta Plan,” July 6, 2018, at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/sed/sac_delta_framework_070618%20.pdf. Hereinafter, California Water Boards, “July 2018 Framework.”

⁴³ California Water Boards, “State Water Board Adopts Bay-Delta Plan Update,” press release, December 12, 2018, at https://www.waterboards.ca.gov/press_room/press_releases/2018/pr121218_bay-delta_plan_update.pdf.

⁴⁴ California Water Boards, “July 2018 Framework.”

Voluntary Agreements

Voluntary agreements are proposed agreements between the State of California and water users that would aim to improve conditions for native fish with new flows for the environment, habitat restoration, and new funding for environmental improvements and science. These agreements, if finalized, would apply in lieu of flow-only measures in the State Water Resources Control Board's update to the Bay-Delta Water Quality Control Plan. The state has created a framework for the agreements, which it expects would be monitored, enforceable, and in place for 15 years. Preliminary estimated costs for implementing the agreements by the state indicate they will cost approximately \$5.2 billion over 15 years. Of this amount, the federal government is assumed to contribute \$740 million, the state government would contribute \$2.2 billion, and water users would contribute \$2.3 billion.

Sources: California State Water Resources Control Board, *Proposals for Voluntary Agreements to Update and Implement the Bay-Delta Plan*, May 4, 2023, at https://waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/proposed_voluntary_agreements.html.

Reclamation and its contractors would likely play key roles in implementing any update to the Bay-Delta Plan, as they do in implementing the current Bay-Delta Plan under D-1641. Pursuant to Section 8 of the Reclamation Act of 1902,⁴⁵ Reclamation generally defers to state water law in carrying out its authorities, but the proposed Bay-Delta Plan Update has generated controversy. In a July 2018 letter to the State Water Board, the Commissioner of Reclamation opposed the proposed standards for the San Joaquin River, arguing that meeting them would necessitate decreased water in storage at New Melones Reservoir of approximately 315,000 AF per year (a higher amount than estimated by the State Water Board). At the time, Reclamation asserted that such a change would be contrary to the CVP prioritization scheme as established by Congress.⁴⁶

On March 28, 2019, the Department of Justice and DOI filed civil actions in federal and state court against the State Water Board for failing to comply with the California Environmental Quality Act (CEQA).⁴⁷ On June 8, 2021, the United States requested that the court stay the case after newly appointed officials in Reclamation decided to pursue other means of resolving the dispute, such as a voluntary agreement.⁴⁸ Settlement discussions, however, were not fruitful, and the federal court is presently allowing the parties to brief certain claims.⁴⁹ Meanwhile, parallel claims are proceeding in state court, where the case is being coordinated with 11 other cases challenging the Bay-Delta Plan Update.⁵⁰

⁴⁵ 43 U.S.C. §383.

⁴⁶ Letter from Brenda Burman, Commissioner, Bureau of Reclamation, DOI, to Felicia Marcus, Chair, State Water Resources Control Board, July 27, 2018, at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/comments_lsjr_finalised/Brenda_Burman_BOR.pdf. Hereinafter, "Letter from Brenda Burman to Felicia Marcus."

⁴⁷ Department of Justice, "United States Files Lawsuit Against California State Water Resources Control Board for Failure to Comply with California Environmental Quality Act," press release, March 28, 2019, at <https://www.justice.gov/opa/pr/united-states-files-lawsuit-against-california-state-water-resources-control-board-failure>; Complaint for Declaratory and Injunctive Relief, *United States v. State Water Res. Control Bd.*, No. 2:19-cv-00547 (E.D. Cal. Mar. 28, 2019); Verified Petition for Writ of Mandate Under the California Environmental Quality Act, *United States v. State Water Res. Control Bd.*, No. 34-2019-80003111 (Cal. Sup. Ct. Mar. 28, 2019).

⁴⁸ Stipulation and Proposed Order Staying Case for 120 Days, *United States v. State Water Resources Control Board*, No. 2:19-cv-00547 (E.D. Cal. June 8, 2021).

⁴⁹ Minute Order, Joint Status Report at 3-4, *United States v. State Water Resources Control Board*, No. 2:19-cv-00547 (E.D. Cal. Feb. 28, 2022).

⁵⁰ Order Granting Petition for Coordination of Add-On Case, State Water Board Cases, JCCP No. 5013 (Dec. 13, 2019 Cal. Sup. Ct.) (granting petition to coordinate *United States v. State Water Resources Control Board*, No. 34-2019-80003111, with coordinated cases in State Water Board Cases, JCCP No. 5013).

Endangered Species Act

Several species listed under the ESA are affected by the operations of the CVP and the SWP.⁵¹ For example, the Delta smelt, a small pelagic fish that was listed as threatened under the ESA in 1993, can be trapped and killed (i.e., “entrained”) in CVP and SWP pumps in the Delta. No Delta smelt were found in the annual September midwater trawl survey in 2021, marking four years in a row with no smelt found in the September survey.⁵²

These results for ESA-listed fish raised concerns for many stakeholders, because a low Delta smelt population could result in greater restrictions on water flowing to users. The survey result also raises larger concerns among stakeholders about the overall health and resilience of the Bay-Delta ecosystem. In addition to Delta smelt, multiple anadromous salmonid species found in the Bay-Delta ecosystem have been listed under the ESA since 1991. These species include the endangered Sacramento River winter-run Chinook salmon, the threatened Central Valley spring-run Chinook salmon, the threatened Central Valley steelhead, threatened Southern Oregon/Northern California Coast coho salmon, and the threatened Central California Coast steelhead.⁵³ Certain runs of chinook salmon also are faced with population declines in the Bay-Delta; scientists estimate that 2% of winter-run juvenile chinook salmon survived the summer of 2021, largely due to drought and warming temperatures.⁵⁴ The number of salmon returning to spawn, however, has varied significantly in the last 10 years.⁵⁵

Biological Opinion Consultation and Legal Activity

Under Section 7 of the ESA, federal agencies generally must consult with FWS in DOI or NMFS in the Department of Commerce (DOC) to determine whether a federal agency action (e.g., project) is likely to jeopardize the continued existence of species listed under the ESA or adversely modify critical habitat.⁵⁶ If an adverse effect is possible, the agency initiates formal consultation with the applicable service, which generally concludes with FWS or NMFS issuing a BiOp on the potential harm the project poses to the species and critical habitat—specifically, whether the action is likely to jeopardize listed species or adversely modify critical habitat, as proposed.⁵⁷ If the action is likely to jeopardize listed species or adversely modify critical habitat, FWS or NMFS suggests any reasonable and prudent alternatives (RPAs) to the action that may avoid such harm.⁵⁸ If the action is not likely to jeopardize listed species or adversely modify critical habitat, or if there are RPAs to the action, the service specifies, as necessary and

⁵¹ Act of December 28, 1973, P.L. 93-205; 87 Stat. 884, codified at 16 U.S.C. §§1531 et seq. This report assumes a basic knowledge of the act; an overview of the ESA and its major provisions may be found in CRS Report R46677, *The Endangered Species Act: Overview and Implementation*, by Pervaze A. Sheikh, Erin H. Ward, and R. Eliot Crafton.

⁵² California Department of Fish and Wildlife, *Monthly Abundance Index for Delta Smelt*, October 2021, at <https://www.dfg.ca.gov/delta/data/fmwt/indices.asp>.

⁵³ *Anadromous* fish are born in freshwater, spend the majority of life in saltwater, and return to freshwater to spawn. Examples include salmon and some species of sturgeon. Winter-run Chinook salmon, listed in 1991, were the first anadromous species listed from the Central Valley. Other species were listed subsequently.

⁵⁴ Nick Cahill, “Data Confirms Salmon Slaughter on California’s Main River,” *Courthouse News Service*, November 4, 2021, at <https://www.courthousenews.com/data-confirms-salmon-slaughter-on-californias-main-river/>.

⁵⁵ California Department of Fish and Wildlife, *CDFW Fisheries Branch Anadromous Resources Assessment - Chinook Salmon*, June 30, 2021, at https://www.calfish.org/ProgramsData/Species/CDFWANadromousResourceAssessment/tabid/415/Agg1270_SelectTab/2/Default.aspx.

⁵⁶ 16 U.S.C. §1536(a)(2).

⁵⁷ 16 U.S.C. §1536(b); 50 C.F.R. §402.14.

⁵⁸ 16 U.S.C. §1536(b)(3).

appropriate, reasonable and prudent measures to reduce the harm.⁵⁹ The BiOp also includes an incidental take statement (ITS), which authorizes the incidental take of listed species from the agency's action, provided the agency complies with the terms and conditions of the ITS that implement the reasonable and prudent measures.⁶⁰ As conditions or plans change, the project agency may be required to reinitiate consultation and give FWS and NMFS another opportunity to assess the project's effects on species and habitat.

BiOps and the consultation process often have resulted in the modification of CVP and SWP operations. In some cases, the CVP and SWP have developed operations plans in ways that would allow a finding that those operations will not jeopardize a listed species or adversely modify critical habitat. In other cases, FWS and NMFS have identified RPAs that they considered necessary to allow such a finding. Those BiOps are subject to judicial review based on claims that they underestimate the potential harm to species and habitat (and thus should impose more stringent RPAs), as well as claims that they overestimate harm to species and habitat (and thus proposed RPAs are unnecessary).

CVP and SWP BiOps have been challenged in court and revised by FWS and NMFS over time. Until 2004, a 1993 winter-run Chinook salmon BiOp and a 1995 Delta smelt BiOp (as amended) governed CVP and SWP operations, including Delta exports, for federal ESA purposes. In 2004, a new BiOp examined a proposed change in SWP and CVP operations known as OCAP (Operations Criteria and Plan). Environmental groups challenged the services' 2004 BiOps. As a result, FWS and NMFS developed new BiOps in 2008 and 2009, respectively.⁶¹ These BiOps both concluded that the coordinated long-term operation of the CVP and SWP, as proposed in Reclamation's 2008 biological assessment (BA), was likely to jeopardize the continued existence of listed species and to destroy or adversely modify designated critical habitat. Accordingly, both BiOps included RPAs designed to allow the CVP and the SWP to continue operating without jeopardizing listed species or destroying or adversely modifying designated critical habitat. The RPAs placed additional restrictions on the amount of water exported via SWP and CVP Delta pumps and other limitations on pumping and release of stored water.⁶² Reclamation accepted the BiOps and began project operations consistent with the FWS and NMFS RPAs.

FWS and NMFS issued new BiOps examining CVP and SWP operations in 2019, and those BiOps are currently in effect. As the rest of this section explains, however, those BiOps have been subject to litigation since they were issued. Reclamation has been operating the CVP pursuant to an IOP that modifies some of the operations in the 2020 ROD while the Biden Administration reconsiders the BiOps.

In August 2016, Reclamation and DWR requested reinitiation of consultation on long-term, system-wide operations of the CVP and the SWP based on new information related to multiple years of drought, species decline, and related data.⁶³ Reclamation issued a new BA on January 31,

⁵⁹ 16 U.S.C. §1536(b)(4).

⁶⁰ 16 U.S.C. §1536(b)(4).

⁶¹ U.S. Fish and Wildlife Service, Formal Endangered Species Act Consultation on the Proposed Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP), December 15, 2008, at https://www.fws.gov/sfbaydelta/Documents/SWP-CVP_OPs_BO_12-15_final_OCR.pdf; National Marine Fisheries Service, Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project, June 4, 2009, at <https://www.fisheries.noaa.gov/resource/document/biological-opinion-and-conference-opinion-long-term-operations-central-valley>.

⁶² Among other things, the 2009 National Marine Fisheries Service BiOp requires temperature considerations for the benefit of species in the Sacramento River and in the Bay-Delta.

⁶³ Letter from David Murillo, Regional Director, Bureau of Reclamation, and Mark W. Cowin, Director, Department of (continued...)

2019, discussing the operational changes proposed by Reclamation and mitigation factors to address listed species.⁶⁴ The BA proposed various operational measures that, according to Reclamation, would benefit listed species, including a shift to pumping based on real-time monitoring rather than calendar-based targets, updated science and monitoring information, and a revised plan for cold-water management and releases at Shasta Dam. Non-operational activities to augment and bolster listed fish populations would include habitat restoration and the introduction of hatchery-bred Delta smelt, among other things.

FWS and the National Oceanic and Atmospheric Administration (NOAA) simultaneously issued BiOps for Reclamation's proposed changes to CVP operations on October 21, 2019.⁶⁵ In contrast to the 2008 and 2009 BiOps, the services concluded that Reclamation's proposed operations would not jeopardize threatened or endangered species or adversely modify their designated critical habitat. In reaching these conclusions, FWS and NMFS reported that they worked with Reclamation during the consultation process to modify the proposed action to reduce potential threats to the listed species and their critical habitat and to increase mitigation measures, such as habitat restoration, to support listed species. The final action was modified to include performance metrics for real-time monitoring, cold-water management in Lake Shasta, increased habitat restoration, and a process for independent scientific review, among other things.⁶⁶ After issuing the BiOps, Reclamation completed its review of environmental impacts of the proposed action under NEPA,⁶⁷ and Reclamation's proposed changes were finalized in an ROD on February 20, 2020.⁶⁸

California and a group of nongovernmental organizations immediately sued the federal government, claiming the 2019 BiOps and the 2020 ROD violated the ESA, NEPA, and Administrative Procedure Act (APA).⁶⁹ All of those plaintiffs asked the court to permanently enjoin the approved operational changes, and also to temporarily stay those operations while the litigation was pending.⁷⁰ The court granted a temporary stay from May 11 to May 31, 2020, but

Water Resources, to Ren Lohofener, Pacific Southwest Regional Director, August 2, 2016, at https://www.fws.gov/sfbaydelta/documents/08-02-2016_BOR-DWR_Reinitiation_Letter.pdf.

⁶⁴ Bureau of Reclamation, *Updates to the Coordinated Long-Term Operation of the CVP and SWP and Related Facilities*, January 2019, at <https://www.usbr.gov/mp/bdo/lto.html>.

⁶⁵ U.S. Fish and Wildlife Service, Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the Central Valley Project and State Water Project, Service File No. 08FBTD00-2019-F-0164, October 21, 2019, at https://www.fws.gov/sfbaydelta/CVP-SWP/documents/10182019_ROC_BO_final.pdf; and National Marine Fisheries Service, Biological Opinion on Long-Term Operation of the Central Valley Project and State Water Project, WCRO-2016-00069, October 21, 2019, at https://www.fws.gov/sfbaydelta/CVP-SWP/documents/10182019_ROC_BO_final.pdf.

⁶⁶ U.S. Fish and Wildlife Service, Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the Central Valley Project and State Water Project, Summary, October 21, 2019, at https://www.fws.gov/sfbaydelta/CVP-SWP/documents/Overall_Summary.pdf.

⁶⁷ After issuing the BiOps, Reclamation completed its review of environmental impacts of the proposed action under NEPA. Reclamation concluded its NEPA review by issuing an environmental impact statement (EIS) on December 19, 2019, regarding the anticipated environmental effects of the action. Bureau of Reclamation, *Final Environmental Impact Statement, Reinitiation of Consultation on the Coordinated Long-Term Modified Operations of the Central Valley Project and State Water Project*, December 2019, at https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=39181. Hereinafter, "Final 2019 EIS."

⁶⁸ Bureau of Reclamation, Record of Decision, Reinitiation of Consultation on the Coordinated Long-Term Modified Operations of the Central Valley Project and State Water Project, February 2020, at https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=39181.

⁶⁹ Complaint for Declaratory and Injunctive Relief, *Cal. Nat. Res. Agency v. Ross*, No. 3:20-cv-01299 (N.D. Cal. Feb. 20, 2020).

⁷⁰ Complaint for Declaratory and Injunctive Relief at 36, *Cal. Nat. Res. Agency v. Ross*, No. 3:20-cv-01299 (N.D. Cal. (continued...))

declined to extend it further.⁷¹ Therefore, the 2019 BiOps and the 2020 ROD went into effect, although the litigation challenging those decisions continued.

Following the change in administration in January 2021, Executive Order 13990 required Reclamation, FWS, and NMFS to reconsider the 2019 BiOps.⁷² In response, the court granted a request to stay the litigation on August 19, 2021.⁷³

On September 30, 2021, Reclamation and California DWR submitted a request for reinitiation of consultation to FWS and NMFS.⁷⁴ In the letter, Reclamation stated that reinitiation was warranted due to anticipated changes to the proposed action (i.e., CVP operations) that may affect the species or critical habitat in ways the services had not analyzed in the 2019 BiOps.⁷⁵ Reclamation stated that its goals in revising CVP operations were “to support species viability, protect life history diversity, support operational flexibility, provide regulatory certainty, support science and monitoring, and to create a single feasible adaptable cooperated operation for the CVP and SWP.”⁷⁶

When it requested additional consultation, Reclamation stated that it would continue to operate the CVP pursuant to the 2019 BiOps and 2020 ROD, but it noted that such operations might be modified by interim measures “as required by ongoing drought conditions or as ordered in conjunction with any ongoing litigation.”⁷⁷ It incorporated those measures into an IOP for the October 1, 2021, to September 30, 2022, water year. Although multiple parties contended that the IOP did not comply with various statutory obligations, the court ultimately issued an injunction for the federal defendants to operate the CVP consistent with the proposed IOP.⁷⁸ The court allowed the 2019 BiOps and 2020 ROD to remain in place, as modified by the IOP, while the agencies reconsidered them, and it stayed the court challenges to those decisions.

Meanwhile, the IOP has been governing CVP operations under the court’s order. In February 2023, the court granted the federal and state parties’ request to continue staying the litigation and directed the parties to operate the CVP pursuant to a revised version of the IOP for the 2023 water

Feb. 20, 2020); Plaintiffs’ Motion for Preliminary Injunction, *Pac. Coast Fed’n of Fishermen’s Ass’ns v. Ross*, No. 3:19-cv-07897 (N.D. Cal. Mar. 5, 2020); Plaintiffs’ Motion for Preliminary Injunction, *Cal. Nat. Res. Agency v. Ross*, No. 1:20-cv-00426 (E.D. Cal. Apr. 21, 2020).

⁷¹ Order Granting in Part and Denying in Part as Moot Motion for Preliminary Injunction and Holding Certain Issues in Abeyance, *Cal. Nat. Res. Agency v. Ross*, No. 1:20-cv-00426, & *Pac. Coast Fed’n of Fishermen’s Ass’n v. Ross*, No. 1:20-cv-00431, at 4 (E.D. Cal. May 11, 2020); Order Denying Without Prejudice Motion for Preliminary Injunction as to Shasta Operations, *Pac. Coast Fed’n of Fishermen’s Ass’n v. Ross*, No. 1:20-cv-00431, at 4 (E.D. Cal. June 24, 2020).

⁷² 86 *Federal Register* 7037, January 25, 2021.

⁷³ Order Granting Motion to Stay Until September 30, 2021, *Pac. Coast Fed’n of Fishermen’s Ass’n v. Raimondo*, No. 1:20-cv-00431, at 6 (E.D. Cal. Aug. 19, 2021).

⁷⁴ Letter from Reclamation to FWS and NMFS, Reinitiation of Section 7 Consultation for the Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP), September 30, 2021.

⁷⁵ Letter from Reclamation to FWS and NMFS, Reinitiation of Section 7 Consultation for the Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP), September 30, 2021. The services’ regulations include four scenarios that require reinitiation of consultation, including “if 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.” 50 C.F.R. §402.16(a)(3).

⁷⁶ Letter from Reclamation to FWS and NMFS, Reinitiation of Section 7 Consultation for the Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP), September 30, 2021, p. 1.

⁷⁷ Letter from Reclamation to FWS and NMFS, Reinitiation of Section 7 Consultation for the Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP), September 30, 2021.

⁷⁸ Order re Motions to Remand Without Vacatur, Stay, and Impose Interim Injunctive Relief, *Pac. Coast Fed’n of Fishermen’s Ass’n v. Raimondo*, No. 1:20-cv-00431, at 112-113 (E.D. Cal. Mar. 11, 2022).

year, referred to as the IOP Extension, until December 31, 2023.⁷⁹ In addition to extending the time frame for the IOP, the IOP Extension adjusts certain provisions of the IOP to clarify points of confusion, updates provisions to reflect how the IOP has been operating in practice, and addresses concerns raised by the court in its March 2022 order.⁸⁰ In December 2023, the court extended the stay and the IOP Extension through March 31, 2024, to allow for consideration of another extension of the stay and the IOP through either December 20, 2024, or the issuance of a new ROD—whichever happens first.⁸¹ The IOP for the 2024 water year would make minor adjustments to the 2023 water year IOP.⁸²

Central Valley Project Improvement Act

In an effort to mitigate many of the environmental effects of the CVP, in 1992, Congress passed the CVPIA as Title 34 of P.L. 102-575. The act made major changes to the management of the CVP. Among other things, it formally established fish and wildlife purposes as an official project purpose of the CVP and called for a number of actions to protect, restore, and enhance these resources. Overall, the CVPIA's provisions resulted in a combination of decreased water availability and increased costs for agricultural and M&I contractors, along with new water and funding sources to restore fish and wildlife. Thus, the law remains a source of tension, and some would prefer to see it repealed in part or in full.

Some of the CVPIA's most prominent changes to the CVP included directives to

- double certain anadromous fish populations by 2002 (which did occur),⁸³
- allocate 800,000 AF of “(b)(2)” CVP yield (600,000 AF in drought years) to fish and wildlife purposes;⁸⁴
- provide water supplies (in the form of “Level 2” and “Level 4” supplies) for 19 designated Central Valley wildlife refuges;⁸⁵ and
- establish a fund, the Central Valley Project Restoration Fund (CVPRF), to be financed by water and power users for habitat restoration and land and water acquisitions.

⁷⁹ Order Granting Request to Extend Interim Operations Plan; Granting in Part and Denying as Moot in Part Requests for Judicial Notice; Granting Motion to Strike SRS Contractors' Request for Alternative Relief; Denying All Other Alternative Requests for Relief; and Staying Case Through December 31, 2023, Pac. Coast Fed'n of Fishermen's Ass'n v. Raimondo, No. 1:20-CV-00431 (E.D. Cal. Feb. 24, 2023); Order re Interim Operations Plan, Pac. Coast Fed'n of Fishermen's Ass'n v. Raimondo, No. 1:20-CV-00431 (E.D. Cal. Feb. 28, 2023).

⁸⁰ Federal Defendants' and State Plaintiffs' September 2022 Joint Status Report at 5-8, ex. 1, ex. 2, Pac. Coast Fed'n of Fishermen's Ass'n v. Raimondo, No. 1:20-cv-00431 (E.D. Cal. Sept. 30, 2022).

⁸¹ Order Continuing Stay and Operation of 2023 IOP Provisions Through March 31, 2024, Pac. Coast Fed'n of Fishermen's Ass'n v. Raimondo, No. 1:20-cv-00431 (E.D. Cal. Dec. 29, 2023); Joint Status Report, Pac. Coast Fed'n of Fishermen's Ass'n v. Raimondo, No. 1:20-cv-00431 (E.D. Cal. Dec. 22, 2023).

⁸² Exs. 1 and 2 to Joint Status Report, Pac. Coast Fed'n of Fishermen's Ass'n v. Raimondo, No. 1:20-cv-00431 (E.D. Cal. Dec. 22, 2023).

⁸³ CVPIA's “fish doubling” goal was established on a baseline of average population levels during the period of 1967-1991.

⁸⁴ The term “(b)(2) water” references the provision in CVPIA that required these allocations.

⁸⁵ Authorized refuge water supply under CVPIA is divided into two categories: Level 2 and Level 4 supplies. Level 2 supplies (422,251 AF, except in critically dry years, when the allocation is reduced to 75%) are the historical average of water deliveries to the refuges prior to enactment of CVPIA. Reclamation is obligated to acquire and deliver this water under CVPIA, and costs are 100% reimbursable by CVP contractors through the Central Valley Project Restoration Fund. For more information, see **Appendix**.

Pursuant to court rulings since enactment of the legislation, CVPIA (b)(2) allocations may be used to meet other state and federal requirements that reduce exports or require an increase from baseline reservoir releases. Thus, in a given year, the aforementioned export reductions due to state water quality and federal ESA restrictions are counted and reported on annually as (b)(2) water, and in some cases overlap with other stated purposes of CVPIA (e.g., anadromous fish restoration). The exact makeup of (b)(2) water in a given year typically varies. For example, in 2014 (a critically dry year), out of a total of 402,000 AF of (b)(2) water, 176,300 AF (44%) was attributed to export reductions for Bay-Delta Plan water quality requirements.⁸⁶ Remaining (b)(2) water was composed of a combination of reservoir releases classified as CVPIA anadromous fish restoration and NMFS BiOp compliance purposes (163,500 AF) and export reductions under the 2009 salmonid BiOp (62,200 AF).⁸⁷ In 2016 (a wet year), 793,000 AF of (b)(2) water included 528,000 AF (66%) of export pumping reductions under FWS and NMFS BiOps and 114,500 AF (14%) for Bay-Delta Plan requirements. The remaining water was accounted for as reservoir releases for the anadromous fish restoration programs, the NMFS BiOp, and the Bay-Delta Plan.⁸⁸

Ecosystem Restoration Efforts

Development of the CVP made significant changes to California's natural hydrology. In addition to the aforementioned CVPIA efforts to address some of these impacts, three ongoing, congressionally authorized restoration initiatives administered by Reclamation also factor into federal activities associated with the CVP:

- The Trinity River Restoration Program (TRRP), attempts to mitigate impacts and restore fisheries impacted by construction of the Trinity River Division of the CVP.
- The San Joaquin River Restoration Program (SJRRP) is an ongoing effort to implement a congressionally enacted settlement to restore fisheries in the San Joaquin River.
- The California Bay-Delta Restoration Program aims to restore and protect areas within the Bay-Delta that are affected by the CVP and other activities.

In addition to their habitat restoration activities, both the TRRP and the SJRRP involve the maintenance of instream flow levels that use water that was at one time diverted for other uses. Each effort is discussed briefly below.

Trinity River Restoration Program

TRRP aims to mitigate impacts of the Trinity Division of the CVP and restore fisheries to their levels prior to the Bureau of Reclamation's construction of this division in 1955. The Trinity Division primarily consists of two dams (Trinity and Lewiston Dams), related power facilities, and a series of tunnels (including the 10.7-mile Clear Creek Tunnel) that divert water from the Trinity River Basin to the Sacramento River Basin and Whiskeytown Reservoir. Diversion of

⁸⁶ Bureau of Reclamation, *Water Year 2014 CVPIA Section 3406(b)(2) Operations and Accounting*, January 28, 2015, at https://www.usbr.gov/mp/cvo/data/FINAL_WY14_b2_presentation.pdf.

⁸⁷ Bureau of Reclamation, *Water Year 2014 CVPIA Section 3406(b)(2) Operations and Accounting*, January 28, 2015, at https://www.usbr.gov/mp/cvo/data/FINAL_WY14_b2_presentation.pdf.

⁸⁸ Bureau of Reclamation, *Water Year 2016 CVPIA §3406(b)(2) Accounting*, at https://www.usbr.gov/mp/cvo/vungvari/FINAL_wy16_b2_800TAF_table_20170930.pdf.

Trinity River water resulted in the near drying of the Trinity River in some years, thereby damaging spawning habitat and severely depleting salmon stocks.

Efforts to mitigate the effects of the Trinity Division date back to the early 1980s, when DOI initiated efforts to study the issue and increase Trinity River flows for fisheries. Congress authorized legislation in 1984 (P.L. 98-541) and in 1992 (P.L. 102-575) providing for restoration activities and construction of a fish hatchery, and directed that 340,000 AF per year be reserved for Trinity River flows (a significant increase from the original amount). Congress also mandated completion of a flow evaluation study, which was formalized in a 2000 ROD that called for additional water for instream flows,⁸⁹ river channel restoration, and watershed rehabilitation.⁹⁰

The 2000 ROD forms the basis for TRRP. The flow releases outlined in that document have in some years been supplemented to protect fish health in the river, and these increases have been controversial among some water users.

San Joaquin River Restoration Program

Historically, the San Joaquin River supported large Chinook salmon populations. After the Bureau of Reclamation completed Friant Dam on the San Joaquin River in the late 1940s, much of the river's water was diverted for agricultural uses and approximately 60 miles of the river became dry in most years. These conditions made it impossible to support Chinook salmon populations upstream of the Merced River confluence.

In 1988, a coalition of environmental, conservation, and fishing groups advocating for river restoration to support Chinook salmon recovery sued the Bureau of Reclamation. A U.S. District Court judge eventually ruled that operation of Friant Dam was violating state law because of its destruction of downstream fisheries.⁹¹ Faced with mounting legal fees, considerable uncertainty, and the possibility of dramatic cuts to water diversions, the parties agreed to negotiate a settlement instead of proceeding to trial on a remedy regarding the court's ruling. This settlement was agreed to in 2006 and implementing legislation was enacted by Congress in 2010 (Title X of P.L. 111-11).

The settlement agreement and its implementing legislation form the basis for the SJRRP, which requires new releases of CVP water from Friant Dam to restore fisheries (including salmon fisheries) in the San Joaquin River below Friant Dam (which forms Millerton Lake) to the confluence with the Merced River, a distance of 60 miles. The SJRRP also requires efforts to mitigate water supply delivery losses due to these releases, among other things. In combination with the new releases, the settlement's goals are to be achieved through a combination of channel and structural modifications along the San Joaquin River and the reintroduction of Chinook salmon. These activities are funded in part by federal discretionary appropriations and in part by repayment and surcharges paid by CVP Friant water users that are redirected toward the SJRRP as required by P.L. 111-11.

Because increased water flows for restoring fisheries (known as *restoration flows*) would reduce CVP diversions of water for off-stream purposes, such as irrigation, hydropower, and M&I uses, the settlement and its implementation have been controversial. The quantity of water used for

⁸⁹ The additional flows outlined in the 2000 record of decision are based on water-year type and range from 369,000 AF in critically dry years to 815,000 AF in extremely wet years. A greater proportion of Trinity River water goes to the river in dry years, and a greater proportion of the water goes to CVP contractors in wet years.

⁹⁰ DOI, Record of Decision for Trinity River Mainstem Fishery Restoration Final Environmental Impact Statement/Environmental Impact Report, December 2000, at http://www.restoresjr.net/?wpfb_dl=2163.

⁹¹ NRDC v. Patterson, 333 F. Supp. 2d 906, 925 (E.D. Cal. 2004).

restoration flows and the quantity by which water deliveries would be reduced are related, but the relationship is not necessarily one to one, due to flood flows in some years and other mitigating factors. Under the settlement agreement, no water would be released for restoration purposes in the driest of years; thus, the agreement would not reduce deliveries to Friant contractors in those years. Additionally, in some years, the restoration flows released in late winter and early spring may free up space for additional runoff storage in Millerton Lake, potentially minimizing reductions in deliveries later in the year—assuming Millerton Lake storage is replenished. Consequently, how deliveries to Friant water contractors may be reduced in any given year is likely to depend on many factors. Regardless of the specifics of how much water may be released for fisheries restoration vis-à-vis diverted for off-stream purposes, the SJRRP will impact existing surface and groundwater supplies in and around the Friant Division service area and affect local economies. SJRRP construction activities are in the early stages, but planning efforts have targeted a completion date of 2024 for the first stage of construction efforts.⁹²

California Bay-Delta Restoration Program

The California Bay-Delta Restoration Program (also sometimes referred to as the “CALFED” Bay-Delta Restoration Program) is a collaborative effort involving state and federal agencies and representatives of California’s urban, agricultural, and environmental communities. The goals of the program are to improve fish and wildlife habitat, water supply reliability, water quality, and levee integrity in the Bay-Delta.

The CALFED program began administratively in 1996, and the CALFED Bay-Delta Restoration Act (P.L. 108-361), enacted in 2004, supplemented those actions with new and expanded federal authorities for seven agencies implementing the existing program. These authorities have been extended on multiple occasions. The current action plan for the Bay-Delta Restoration Program has four objectives: a renewed federal-state partnership, smarter water supply and use, habitat restoration, and drought and floodplain management.⁹³

A summary of agency activities under CALFED is generally included as a “crosscut budget” in the Analytical Perspectives section of the Administration’s budget request. In FY2020, the Administration reported appropriations of \$651.49 million for CALFED Bay-Delta-related activities, with Reclamation funding accounting for \$361.21 million (55%) of this total.⁹⁴ Reclamation typically spends the majority of this funding on habitat restoration projects to address the degraded Bay-Delta ecosystem.⁹⁵ Other agencies also receive funding to carry out authorities under this program, including DOI’s FWS and U.S. Geological Survey, the U.S. Department of Agriculture’s Natural Resources Conservation Service, USACE, NOAA, and the Environmental Protection Agency. Similar to Reclamation, these agencies report on expenditures for the CALFED/Bay-Delta program that involve a combination of activities under “base” authorities, and new authorities that Congress enacted in the aforementioned CALFED authorizing legislation

⁹² For more information, see San Joaquin River Restoration Program (SJRRP), *Funding Constrained Framework for Implementation*, May 2018.

⁹³ *Interim Federal Action Plan for the California Bay-Delta*, December 22, 2009, at <http://www.doi.gov/news/doinews/upload/CAWaterWorkPlan.pdf>.

⁹⁴ Office of Management and Budget, *Analytical Perspectives: CALFED Bay-Delta Federal Budget Crosscut Report*, Office of Management and Budget, Fiscal Year 2023 Budget Request.

⁹⁵ In addition to funding under its CALFED authorities and through its CALFED Account, Reclamation counts funding under its other CVP restoration authorities (e.g., CVPIA, SJRRP) as CALFED activities in its annual reporting.

New Storage and Conveyance

Reductions in available water deliveries due to hydrological and regulatory factors have caused some stakeholders, legislators, and state and federal government officials to look at other methods of augmenting water supplies. In particular, proposals to build new or augmented CVP and/or SWP water storage projects have been of interest to some policymakers. Additionally, the State of California is pursuing a major water conveyance project, the California WaterFix, with a nexus to CVP operations.

New and Augmented Water Storage Projects

In recent years, new and augmented water storage projects have been proposed throughout the Central Valley, as well as in other areas of California. While it is unclear whether any of these projects will be completed and/or incorporated into the CVP itself, their status has ramifications for the water supply questions related to the CVP. In the past, construction recommendations for new Reclamation projects have been subject to congressional approval. Section 4007 of the WIIN Act authorized Reclamation financial support for new or expanded federal and nonfederal water storage projects. It also provided that these projects could be deemed authorized, subject to a finding by the Administration that individual projects met certain criteria and were recommended by name in an enacted appropriations act.⁹⁶ **Table 4** shows recent funding for these projects, including regular appropriations and FY2022 funding that was allocated from the Infrastructure Investment and Jobs Act (P.L. 117-58).⁹⁷ Most of the projects recommended by current and prior Administrations under this authority have been approved by Congress in enacted appropriations legislation. The only exception was funding that the Trump Administration proposed for the Shasta Dam and Reservoir Enlargement Project in 2019 and 2020, which was not agreed to by Congress.

⁹⁶ For more information, see CRS In Focus IF10626, *Reclamation Water Storage Projects: Section 4007 of the Water Infrastructure Improvements for the Nation (WIIN) Act*, by Charles V. Stern.

⁹⁷ For more information, see CRS Report R47032, *Bureau of Reclamation Provisions in the Infrastructure Investment and Jobs Act (P.L. 117-58)*, by Charles V. Stern and Anna E. Normand.

Table 4. Allocations for WIIN Act Section 4007 Water Storage Projects in California, 2018-2023
(\$ in millions)

Project (State)	Administration Recommendations for Regular Appropriations						IIJA Allocations		
	Jan. 2018	Feb. 2019	June 2020	Dec. 2020	July 2021	Nov 2022	July 2023 (req.)	Oct. 2022 IIJA	July 2023 IIJA
Shasta Dam and Reservoir Enlargement Project (CA)	\$20.00	—	—	—	—	—	—	—	—
Sites Reservoir Storage Project (CA)	\$4.35	\$6.00	\$4.00	\$9.70	\$80.00	\$80.0	\$205.6	\$30.0	\$30.0
Upper San Joaquin River Basin Storage Investigation (CA)	\$1.50	—	—	—	—	—	—	—	—
Friant-Kern Canal Subsidence Challenges Project (CA)	\$2.20	\$2.35	\$71.00	\$135.00	—	—	—	—	—
Boise River Basin Feasibility Study (ID)	\$0.75	\$1.75	\$2.88	\$10.00	—	—	—	—	—
Del Puerto Water District Feasibility Study (CA)	—	\$1.50	\$1.50	—	\$15.00	—	—	—	—
Los Vaqueros Reservoir Phase 2 Expansion (CA)	—	\$2.16	\$7.85	\$4.10	\$50.00	\$18.0	—	\$82.0	\$10.0
Delta Mendota Canal Subsidence Correction (CA)	—	—	\$3.00	—	—	—	—	—	—
San Luis Low Point Improvement Project (CA)	—	—	\$1.70	—	—	—	—	—	—
Sacramento Regional Water Bank (CA)	—	—	\$0.87	—	—	—	—	—	—
B.F. Sisk Dam Raise and Reservoir Expansion (CA)	—	—	—	—	\$60.00	—	—	\$25.0	\$10.0

Sources: Bureau of Reclamation Reports to House and Senate Committees on Appropriations, January 2018, February 2019, June 2020, December 2020, July 2021, November 2022, and July 2023; enacted appropriations legislation for FY2018 (P.L. 115-141), FY2020 (P.L. 116-94), FY2021 (P.L. 116-260), FY2022 (P.L. 117-43), and FY2023 (P.L. 117-328); Bureau of Reclamation, *Implementation of the Bipartisan Infrastructure Law: 4th Addendum to the FY2022 Initial Spend Plan*, September 30, 2022; Bureau of Reclamation, *Implementation of the Bipartisan Infrastructure Law: Addendum to the FY2023 Initial Spend Plan*, July 19, 2023.

Notes: In its proposed project allocations to Congress for 2019 and 2020, Reclamation recommended a total of \$172 million for the Shasta Dam and Reservoir Enlargement Project. Congress did not agree to these allocations. IJA = Infrastructure Investment and Jobs Act (P.L. 117-58). Pursuant to that legislation, IJA allocations are not subject to congressional approval.

Delta Conveyance Project

In addition to water storage, some have advocated for a more flexible water conveyance system for CVP and SWP water. In spring 2019, California Governor Gavin Newsom introduced a plan for conveying water through the Delta, known as the Delta Conveyance Project.

The Delta Conveyance Project is expected to involve the construction of a single tunnel to convey water from two intakes on the Sacramento River to the existing pumps in the Bay-Delta. DWR's stated reasons for supporting this approach are to protect water supplies from sea-level rise, saltwater intrusion, and earthquakes.⁹⁸ The Delta Conveyance Design and Construction Authority, a joint powers authority created by public water agencies to oversee the design and construction of the new conveyance system, is leading the project.⁹⁹ DWR is overseeing the planning effort for the project; the estimated \$15.9 billion cost is expected to be paid largely by public water agencies.¹⁰⁰ The federal government's role in the project beyond evaluating permit applications and maintaining related CVP operations has not been defined.¹⁰¹ Regardless of federal participation, the operations of a new Delta Conveyance Project could have implications for combined state/federal pumping operations in the Bay-Delta.¹⁰² The State of California released its draft environmental impact report for the project in July 2022.¹⁰³

Some stakeholders support the initiative because it might result in lower fish mortality at the pumps, more consistent water supplies for users, and greater protection against earthquakes and levee failures. Others assert that the project's cost might not be worth the benefits and that the effort might not benefit water users without assurances of water supplies.

Congressional Interest

Congress plays a role in CVP water management and has attempted to make available additional water supplies in the region by facilitating efforts such as water banking, water transfers, and the construction of new and augmented storage. In 2016, Congress enacted provisions aiming to benefit the CVP and the SWP, including major operational changes in the WIIN Act and additional appropriations for western drought response and new water storage that have benefited (or are expected to benefit) the CVP. Congress also continues to consider legislation that would further alter CVP operational authorities and responsibilities related to individual project units. The below section discusses some CVP-related issues that may receive congressional attention.

⁹⁸ California Department of Water Resources, "State Withdraws WaterFix Approvals, Initiates Planning and Permitting for a Smaller Single Tunnel," press release, May 2, 2019, at <https://water.ca.gov/News/News-Releases/2019/May/State-Withdraws-WaterFix-Approvals>. Hereinafter, "DWR May 2019 Press Release."

⁹⁹ California Department of Water Resources, *Modernizing Delta Conveyance Infrastructure Q&A*, California Department of Water Resources, at <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Delta-Conveyance/Delta-Conveyance-QA.pdf?la=en&hash=373E0DBCD7AD988C9987A3197304E55D9115F798>.

¹⁰⁰ California Department of Water Resources, *Frequently Asked Questions Related to the Delta Conveyance Project*, August 2021, at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Delta-Conveyance/Public-Information/DCP_FAQ_Final_August_2021.pdf. Hereinafter, California Department of Water Resources, *Frequently Asked Questions*.

¹⁰¹ California Department of Water Resources, *Frequently Asked Questions*.

¹⁰² The State of California notes that Section 7 consultation under the ESA is anticipated for the project. The lead federal action agency for consultation under ESA is expected to be USACE.

¹⁰³ California Department of Water Resources, "DWR Releases Draft Environmental Impact Report for Delta Conveyance Project," press release, July 27, 2022, <https://water.ca.gov/News/News-Releases/2022/July-22/DWR-Releases-Draft-Environmental-Impact-Report-for-Delta-Conveyance-Project>.

CVP Operations Under the WIIN Act and Other Authorities¹⁰⁴

While the WIIN Act provided Reclamation with new CVP operational authorities and directives, Reclamation has reported limited implementation of some provisions prior to their expiration in 2021. For instance, Reclamation reported that, pursuant to the WIIN Act, communication and transparency between Reclamation and other agencies increased for some operational decisions, allowing for reduced or rescheduled pumping restrictions.¹⁰⁵ Additionally, in the spring of 2018, WIIN Act allowances of relaxed restrictions on inflow-to-export ratios were used to effect a transfer resulting in additional exports of 50,000-60,000 AF of water.¹⁰⁶ Reclamation noted that hydrology during 2017 and 2018 affected the agency's ability to implement some of the act's provisions. In some cases, Reclamation proposed other federal operational changes pursuant to the WIIN Act that reportedly were deemed incompatible with state requirements.¹⁰⁷

Most of the WIIN Act's operational provisions expired at the end of 2021 (five years after the bill's enactment). However, the Trump Administration's revised 2020 BiOps cited congressional direction to maximize water supplies in Section 4001 of the WIIN Act. During the Trump Administration, Reclamation also reported that the general principles in Sections 4002-4003 of the WIIN Act had been incorporated into its operational changes.¹⁰⁸ Thus, some of the WIIN Act CVP directives could continue to be incorporated into CVP operations insofar as the 2019 BiOps continue to be implemented.

Congress may be interested in oversight of CVP operational questions, including the status of the BiOps and the process underpinning any alterations to operations. Some also may propose extension of the WIIN Act operational provisions, thereby extending legislatively mandated requirements and authorities on CVP operations. In the 118th Congress, H.R. 215, the WATER for California Act, would among other things amend and extend the WIIN Act CVP operational authorities through 2033 and require that Reclamation operate the project pursuant to the 2019 BiOps. This legislation was incorporated as Title V of H.R. 4394 (the House-passed Energy and Water Development and Related Agencies Appropriations Act, 2024).

In debating CVP operations issues, stakeholders likely will focus on the extent to which the changes provide for increased water deliveries relative to pre-reconsultation baselines for CVP and SWP contractors and any related effects on species and water quality. Congress also may be interested in disagreements between state and federal project operators related to proposed operating procedures and species protections, including how these disagreements may affect the historical norms of coordinated project operations and what this might mean for water deliveries. Proposed voluntary agreements under the Bay-Delta Water Quality Plan also may receive congressional attention in this context.

¹⁰⁴ For more information on these provisions, see CRS Report R44986, *Water Infrastructure Improvements for the Nation (WIIN) Act: Bureau of Reclamation and California Water Provisions*, by Charles V. Stern, Pervaze A. Sheikh, and Nicole T. Carter.

¹⁰⁵ Personal communication with the Bureau of Reclamation, May 30, 2018.

¹⁰⁶ This provision of the WIIN Act generally lessened existing restrictions on the amount of water that could be exported for water transfers. Personal communication with the Bureau of Reclamation, May 30, 2018.

¹⁰⁷ Personal communication with the Bureau of Reclamation, May 30, 2018.

¹⁰⁸ Bureau of Reclamation, *Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project*, Final Biological Assessment, October 2019, pp. 1-6.

New Water Storage Projects

As noted, Reclamation and the State of California have funded the study of new water storage projects in recent years. Congress may opt to provide additional direction for these and other efforts to develop new water supplies for the CVP in future appropriations acts and reports. In addition, Congress may consider oversight, authorization, and/or funding for these projects. Some projects, such as the Shasta Dam and Reservoir Enlargement Project, could augment CVP water supplies but have generated controversy for their potential to conflict with the intent of certain state laws.¹⁰⁹ Although Reclamation under the Trump Administration previously indicated its interest in pursuing the Shasta Dam and Reservoir Enlargement Project, the state has consistently opposed the project because it violates the state's Wild and Scenic Rivers law. It is unclear how such a project might proceed absent state regulatory approvals and financial support.

Apart from the Shasta Dam and Reservoir Enlargement Project, Congress has recently approved Reclamation-recommended study funding for other projects that could add flexibility to CVP operations, including the Sites Reservoir Project, the Los Vaqueros Reservoir Phase 2 Project, and the Friant-Kern Canal Subsidence Challenges Project, among others. Overall, from FY2017 to FY2021, Congress appropriated a total of \$603 million to Reclamation for new and augmented water storage projects authorized under Section 4007 of the WIIN Act. The Infrastructure Investment and Jobs Act (P.L. 117-58), enacted in November 2021, appropriated an additional \$1.05 billion for these projects. A significant share of this funding is likely to be allocated for projects that benefit the CVP and other areas in California.¹¹⁰

In the 118th Congress, H.R. 215 would reauthorize the WIIN Act's storage authorities through the end of 2028 (most of these authorities expired in late 2021) and would make the Shasta Reservoir Enlargement project eligible for WIIN Act funding. As noted above, this legislation was incorporated into H.R. 4394, the House-passed Energy and Water Appropriations bill.

Concluding Observations

The CVP is one of the largest, most complex water storage and conveyance projects in the world. Congress has regularly expressed interest in CVP operations and allocations, in particular pumping in the Bay-Delta. In addition to ongoing oversight of project operations and previously enacted authorities, a number of developing issues and proposals related to the CVP may be of interest to congressional decisionmakers. These issues include study and approval of new water storage and conveyance projects, updates to the state's Bay-Delta Water Quality Plan, and the status of CVP BiOps and related efforts to make available more water for CVP water contractors (in particular those south of the Delta). Stressors on California water supplies (i.e., drought) are likely to magnify these issues in the future.

¹⁰⁹ In particular, Section 5093.542 of the California State Public Resources Code prevents participation (other than technical or economic feasibility studies of the Shasta Dam raise project) by state departments or agencies in facilities that would have an adverse effect on the free-flowing condition of the McCloud River. In previous documents, Reclamation indicated this requirement could limit some state agency participation in the project.

¹¹⁰ Reclamation announced its first funding allocation for these projects, for \$210 million, on October 17, 2022. Of this funding, \$137 million will go toward projects in California. See Bureau of Reclamation, "Biden-Harris Administration Announces \$210 million for Drought Resilience Projects in the West," press release, October 17, 2022, at <https://www.usbr.gov/newsroom/news-release/4356>.

Appendix. CVP Water Contractors

The below sections provide a brief discussion some of the major contractor groups and individual contractors served by the CVP.

Sacramento River Settlement Contractors and San Joaquin River Exchange Contractors (Water Rights Contractors)

Reclamation first makes CVP water available for delivery to contractors north and south of the Delta with water rights that predate construction of the CVP. The two largest of these groups are the Sacramento River Settlement Contractors and the San Joaquin River Exchange Contractors. (These contractors are sometimes referred to collectively as *water rights contractors*.)

Sacramento River Settlement Contractors include the 145 contractors (both individuals and districts) that diverted natural flows from the Sacramento River prior to the CVP's construction and executed a settlement agreement with Reclamation that provided for negotiated allocation of water rights. Reclamation entered into this agreement in exchange for these contractors withdrawing their protests related to Reclamation's application for water rights for the CVP. As a result of their settlement, Sacramento River Settlement Contractors receive most of their supplies ("base supplies") free of charge, while additional "project supplies" also are delivered to these contractors based on reclamation law and pricing requirements.¹¹¹ These contractors typically receive 100% of their contracted amounts in most water-year types. During "critical" years, Reclamation may reduce total deliveries to these contractors by a maximum of 25%.¹¹²

The San Joaquin River Exchange Contractors include four irrigation districts that agreed to "exchange" exercising their water rights to divert water on the San Joaquin and Kings Rivers for guaranteed water deliveries from the CVP (typically in the form of deliveries from the Delta-Mendota Canal and waters north of the Delta). During all years except for when critical conditions are declared, Reclamation is responsible for delivering 840,000 acre-feet (AF) of "substitute" water to these users (i.e., water from north of the Delta as a substitute for San Joaquin River water). In Critical years, this substitute water is reduced to 650,000 AF. In the event Reclamation is unable to make its contracted deliveries, these contractors have the right to divert water directly from the San Joaquin River, which may in turn reduce water available for other San Joaquin River water service contractors.

Friant Division Contractors

CVP's Friant Division contractors receive water stored behind Friant Dam (completed in 1944) in Millerton Lake. This water is delivered through the Friant-Kern and Madera Canals. The 32 Friant Division contractors, who irrigate roughly 1 million acres on the San Joaquin River, are contracted to receive two "classes" of water: Class 1 water is the first 800,000 AF available for delivery;¹¹³ Class 2 water is the next 1.4 million AF available for delivery. Some districts receive water from both classes. Generally, Class 2 waters are released as "uncontrolled flows" (i.e., for flood control concerns), and may not necessarily be scheduled at a contractor's convenience.

¹¹¹ The total amount of base supply is 1,775,509 acre-feet (AF) and the total amount of project water is 340,111 AF.

¹¹² Critical years are years in which either (1) the forecasted full natural inflow to Shasta Lake for the current water year is equal to or less than 3.2 million AF or (2) the total accumulated actual deficiencies below 4 million AF in the immediately prior water year, together with the forecasted efficiency for the current water year, exceed 800,000 AF.

¹¹³ This water typically is provided for municipal and industrial use or for districts without access to groundwater.

Deliveries to the Friant Division are affected by a 2009 congressionally enacted settlement stemming from Friant Dam's effects on the San Joaquin River.¹¹⁴ The settlement requires reductions in deliveries to Friant users for protection of fish and wildlife purposes. In some years, some of these "restoration flows" have been made available to contractors for delivery as Class 2 water.

Unlike most other CVP contractors, Friant Division contractors have converted their water service contracts to repayment contracts and have repaid their capital obligation to the federal government for the development of their facilities. In years in which Reclamation is unable to make contracted deliveries to Exchange Contractors, these contractors can make a "call" on water in the San Joaquin River, thereby requiring releases from Friant Dam that otherwise would go to Friant contractors.

South-of-Delta (SOD) Water Service and Repayment Contractors: Westlands Water District

As shown in **Figure 3**, SOD water service and repayment contractors account for a large amount (2.09 million AF, or 22.1%) of the CVP's contracted water. The largest of these contractors is Westlands Water District, which consists of 700 farms covering more than 600,000 acres in Fresno and Kings Counties. In geographic terms, Westlands is the largest agricultural water district in the United States; its lands are valuable and productive, producing more than \$1 billion of food and fiber annually.¹¹⁵ Westlands' maximum contracted CVP water is in excess of 1.2 million AF, an amount that makes up more than half of the total amount of SOD CVP water service contracts and significantly exceeds any other individual CVP contractor.¹¹⁶ Due to a number of factors, Westlands often receives considerably less water on average than it did historically.

Westlands has been prominently involved in a number of policy debates, including proposals to alter environmental requirements to increase pumping south of the Delta. Westlands is also involved in a major proposed settlement with Reclamation, the San Luis Drainage Settlement. The settlement would, among other things, forgive Westlands' share of federal CVP repayment responsibilities in exchange for relieving the federal government of its responsibility to construct drainage facilities to deal with toxic runoff associated with naturally occurring metals in area soils.

Central Valley Wildlife Refuges

The 20,000 square mile California Central Valley provides valuable wetland habitat for migratory birds and other species. As such, it is the home to multiple state and federally designated wildlife refuges north and south of the Delta. These refuges provide managed wetland habitat that receives water from the CVP and other sources.

¹¹⁴ When constructed, Friant Dam impounded the entire flow of the San Joaquin River, except for releases to manage flooding and provide water for some riparian water rights holders immediately below the dam. For more information, see the section "San Joaquin River Restoration Program."

¹¹⁵ Westlands Water District, "Who We Are," at <https://wwd.ca.gov/wp-content/uploads/2016/08/wwd-who-we-are.pdf>.

¹¹⁶ CRS analysis of data from Bureau of Reclamation, "Central Valley Project Water Contractors," March 30, 2016, at <https://www.usbr.gov/mp/cvp-water/docs/latest-water-contractors.pdf>.

The Central Valley Project Improvement Act (CVPIA; P.L. 102-575),¹¹⁷ enacted in 1992, sought to improve conditions for fish and wildlife in these areas by providing them coequal priority with other project purposes. CVPIA also authorized a Refuge Water Supply Program to acquire approximately 555,000 AF annually in water supplies for 19 Central Valley refuges administered by three managing agencies: California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and Grassland Water District (a private landowner). Pursuant to CVPIA, Reclamation entered into long-term water supply contracts with the managing agencies to provide these supplies.

Authorized refuge water supply under CVPIA is divided into two categories: Level 2 and Level 4 supplies. Level 2 supplies (approximately 422,251 AF, except in critically dry years, when the allocation is reduced to 75%) are the historical average of water deliveries to the refuges prior to enactment of CVPIA.¹¹⁸ Reclamation is obligated to acquire and deliver this water under CVPIA, and costs are 100% reimbursable by CVP contractors through a fund established by the act, the Central Valley Project Restoration Fund (CVPRF; see previous section, “Central Valley Project Improvement Act”). Level 4 supplies (approximately 133,264 AF) are the additional increment of water beyond Level 2 supplies for optimal wetland habitat development. This water must be acquired by Reclamation through voluntary measures and is funded as a 75% federal cost (through the CVPRF) and 25% state cost.

In most cases, the Level 2 requirement is met; however, Level 4 supplies have not always been provided in full for a number of reasons, including a dearth of supplies due to costs in excess of available CVPRF funding and a lack of willing sellers. In recent years, costs for the Refuge Water Supply Program (i.e., the costs for both Level 2 and Level 4 water) have ranged from \$11 million to \$20 million.

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¹¹⁷ P.L. 102-575, Title 34, 106 Stat. 4706.

¹¹⁸ Prior to the Central Valley Project Improvement Act (CVPIA; P.L. 102-575), refuges had a legal entitlement only to 121,700 AF.

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