



Report to the Committee on
Transportation and Infrastructure,
House of Representatives

August 2018

SAN FRANCISCO BAY DELTA WATERSHED

Wide Range of Restoration Efforts Need Updated Federal Reporting and Coordination Roles

GAO Highlights

Highlights of [GAO-18-473](#), a report to the Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

The San Francisco Bay Delta watershed—which drains a vast area of California from the Sierra Nevada Mountains to the Pacific Ocean—supplies drinking water for 25 million people and provides irrigation for about half the nation's fruit and vegetable production. Decades of development and agriculture have led to large reductions in water quality and supply, natural flood protection, and habitats across the watershed's three major regions: the Bay, the Delta, and the upper watershed. Federal entities have been working with nonfederal entities for decades to protect and restore the watershed. GAO was asked to review restoration efforts in the watershed.

This report examines, among other objectives, (1) the extent to which federal and nonfederal entities coordinate watershed restoration efforts and (2) information on the status of these efforts and related expenditures for fiscal years 2007 through 2016, the most recent data available. GAO reviewed laws; regional databases, plans, and reports; and budget documents. It also surveyed the 72 members of interagency groups (48 responded) and interviewed federal and nonfederal officials.

What GAO Recommends

GAO made seven recommendations, including that Interior and CEQ update or revise the Interim Federal Action Plan and that Interior and OMB coordinate with the state to meet the CALFED Act's reporting requirements. Interior partially concurred with the recommendations, and CEQ and OMB neither agreed nor disagreed with them. GAO maintains its recommendations are valid.

View [GAO-18-473](#). For more information, contact J. Alfredo Gómez at (202) 512-3841 or gomezj@gao.gov.

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Wide Range of Restoration Efforts Need Updated Federal Reporting and Coordination Roles

What GAO Found

Federal entities, including the Department of the Interior, and nonfederal entities, such as California state agencies and nonprofits, carry out and coordinate a wide range of restoration efforts in the San Francisco Bay Delta watershed. These efforts have multiple benefits, such as improved water quality and habitat in restored marshland (see fig. below). The entities coordinate comprehensive efforts in the San Francisco Bay area (Bay) and Sacramento-San Joaquin Delta (Delta) through two groups. Federal efforts across the watershed are to be led and coordinated by Interior and the Council on Environmental Quality (CEQ) through a 2009 Interim Federal Action Plan, but not all federal entities are using the plan. Interior officials said the plan is no longer relevant because state and federal roles have changed. For example, they said a state-led committee acts as the coordinating body for federal entities; however, this committee focuses on one region of the watershed, while federal funding supports efforts in all three regions. By updating or revising the Interim Action Plan, Interior and CEQ could help clarify federal roles in supporting restoration efforts in the watershed.

Restoration Project at the South Bay Salt Ponds in the San Francisco Bay Delta Watershed



Source: Cris Benton. | GAO-18-473

Photo shows transition from former industrial salt pond (left) to tidal marsh (right) through a restoration project by multiple federal and nonfederal entities. Map shows watershed's three regions.

Information on the status of all restoration efforts across the watershed, including their accomplishments, is unknown because information is not being fully collected or reported. Also, related expenditures for fiscal years 2007 through 2016 are unknown, in part because federal reports do not include complete or reliable data for restoration efforts in the watershed. The 2004 CALFED Bay-Delta Authorization Act requires Interior and the Office of Management and Budget (OMB) to report annually to Congress on restoration accomplishments and federal and state expenditures in the watershed, respectively. Interior has not issued these reports since 2009, when the state agency from which Interior had obtained the state data was abolished. OMB has issued its reports with federal, but not state, data for the same reason. However, Interior and OMB have not reached out to other state entities for this information. Without obtaining and reporting available information, as required by law, Interior and OMB will not have reasonable assurance that they are providing Congress with the information needed to monitor federal and nonfederal restoration efforts and expenditures.

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Abbreviations

Bay	San Francisco Bay and its local watershed
CALFED	CALFED Bay-Delta Program
CALFED Act	Calfed Bay-Delta Authorization Act
CCMP	Comprehensive Conservation and Management Plan
CEQ	Council on Environmental Quality
Delta	Sacramento-San Joaquin Delta
EPA	Environmental Protection Agency
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
OMB	Office of Management and Budget
USDA	U.S. Department of Agriculture

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August 16, 2018

The Honorable Bill Shuster
Chairman
The Honorable Peter DeFazio
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

The health of the San Francisco Bay Delta watershed—which drains a vast area of California from the Sierra Nevada Mountains to the Pacific Ocean—affects the well-being of millions of Americans.¹ The watershed consists of three major geographic areas: the San Francisco Bay and its local watershed (Bay); the Sacramento-San Joaquin Delta (Delta);² and the expansive upper watershed, which includes California’s Central Valley and the western slope of the Sierra Nevada Mountains. Throughout the entire watershed, reservoirs, canals, and other water supply infrastructure convey fresh water to major agricultural areas and population centers in the San Francisco Bay area and southern parts of California, including water for important manufacturing, technology, and entertainment sectors. According to the Environmental Protection Agency (EPA), the watershed supplies at least some of the drinking water for about 25 million Californians and supports an important share of the U.S. economy by providing irrigation for about half the nation’s fruit and vegetable production, natural flood protection for significant economic areas such as Silicon Valley, and deep water ports for international trade, among other things.³ Levees and other flood control infrastructure provide flood

¹A watershed is an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. The watershed consists of surface water—lakes, streams, reservoirs, and wetlands—and all the underlying ground water. Larger watersheds contain many smaller watersheds.

²A delta is the area where sediment deposits accumulate at the mouth of a river. In 1959, the California legislature amended the California Water Code to establish legal geographic boundaries for the Delta. See 1959 Cal. Stat. 4247 (codified at CAL. WATER CODE § 12220).

³Major highways, airports, railroads, and other transportation infrastructure across the watershed provide transit for wide-ranging commercial activities. In addition, electric power stations, transmission lines, gas pipelines, and other energy infrastructure span the watershed to provide energy generation and delivery to large cities, including major metropolises outside the watershed such as Los Angeles.

protection for farms and communities across the Central Valley and in other parts of the watershed.⁴

The watershed also provides habitat for hundreds of animal and plant species, including several that are endangered or threatened. Significant development and agriculture production over the past 150 years has physically modified the watershed and strained many of its natural resources. According to EPA, these changes have led to large reductions in water quality and supply, challenges for flood protection, and declines in species and their habitat.⁵ For example, most of the watershed's historical wetlands, which perform key functions such as filtering pollutants and absorbing storm surges, have been lost.⁶ Since 1972, EPA has worked with the state of California to develop and enforce water quality standards for the watershed, and since at least 1987, EPA and other federal entities have worked through a variety of partnerships with the state and other nonfederal entities, such as nongovernmental organizations, to protect and restore the watershed's complex ecosystem. Even with these activities, important parts of the watershed remain under considerable stress, and potential solutions are complicated and resource-intensive.⁷

According to EPA, dozens of federal and nonfederal entities, including state government agencies, have responsibilities related to water quality improvement and ecosystem restoration efforts in the San Francisco Bay

⁴A levee is an artificial wall of soil or other material built along waterways to protect adjoining land from flooding.

⁵See Environmental Protection Agency, *Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: EPA's Action Plan* (August 2012).

⁶See The Bay Institute of San Francisco, *From the Sierra to the Sea: The Ecological History of the San Francisco Bay-Delta Watershed* (Novato, CA: July 1998).

⁷See San Francisco Estuary Institute, *A Delta Renewed: A Guide to Science-Based Ecological Restoration in the Sacramento-San Joaquin Delta*, a report prepared for the California Department of Fish and Wildlife and Ecosystem Restoration Program (Richmond, CA: November 2016) and *A Delta Transformed: Ecological Functions, Spatial Metrics, and Landscape Change in the Sacramento-San Joaquin Delta*, a report prepared for the California Department of Fish and Wildlife and Ecosystem Restoration Program (Richmond, CA: October 2014); Public Policy Institute of California, *Stress Relief: Prescriptions for a Healthier Delta Ecosystem* (San Francisco, CA: Apr. 29, 2013); and National Research Council of the National Academies, *Sustainable Water and Environmental Management in the California Bay-Delta* (Washington, DC: Mar. 29, 2012).

Delta watershed.⁸ Key federal entities include EPA, the National Oceanic and Atmospheric Administration (NOAA), U.S. Army Corps of Engineers, U.S. Department of Agriculture (USDA), Council on Environmental Quality (CEQ),⁹ and several entities within the Department of the Interior, including the Bureau of Reclamation, U.S. Fish and Wildlife Service, and the U.S. Geological Survey. In addition, the Office of Management and Budget (OMB) is required to submit a report to Congress, in coordination with the Governor of California and certified by the Secretary of the Interior, that contains financial information related to many of these efforts.¹⁰ Key nonfederal entities include the Delta Stewardship Council, a California state agency that oversees the state government's plan for promoting a more reliable water supply and a healthy ecosystem, and a variety of other organizations, such as state, local, and regional government agencies and nonprofit science institutes. Different combinations of federal and nonfederal entities work in each of the watershed's three major geographic areas: the Bay, Delta, and upper watershed. See appendix I for a list of selected federal and nonfederal entities and some of their restoration-related roles in the watershed.

You asked us to review restoration efforts in the San Francisco Bay Delta watershed. This report examines (1) the extent to which federal and nonfederal entities coordinate their San Francisco Bay Delta watershed restoration efforts, (2) the extent to which federal and nonfederal entities have developed measurable goals and approaches to assess progress for San Francisco Bay Delta watershed restoration efforts, (3) information on the status of San Francisco Bay Delta watershed restoration efforts and related expenditures for fiscal years 2007 through 2016, and (4) key factors that may limit San Francisco Bay Delta watershed restoration, according to federal and nonfederal entities.

⁸For the purposes of this report, we refer to water quality improvement and ecosystem restoration efforts and activities collectively as restoration efforts.

⁹CEQ coordinates federal environmental efforts and works closely with agencies and other entities within the Executive Office of the President in the development of environmental initiatives. CEQ was established within the Executive Office of the President by the National Environmental Policy Act of 1969, Pub. L. No. 91-190, § 202, 83 Stat. 852, 854 (1970) (codified at 42 U.S.C. § 4342). The Environmental Quality Improvement Act of 1970 provided CEQ with additional responsibilities. Pub. L. No. 91-224, title II, 84 Stat. 114 (1970) (codified as amended at 42 U.S.C. §§ 4371-4375).

¹⁰Calfed Bay-Delta Authorization Act, Pub. L. No. 108-361, § 106(c), 118 Stat. 1681, 1700 (2004).

To address all four objectives, we reviewed relevant federal and state laws and documents and interviewed officials from 28 federal, state, and other entities. To examine the extent to which federal and nonfederal entities coordinate their San Francisco Bay Delta watershed restoration efforts, we interviewed officials from federal, state, and other entities to identify restoration activities and key regional plans and coordination efforts, and we reviewed these activities, plans, and efforts. We compared federal coordination efforts against a selection of our leading collaboration practices to assess the extent to which they followed these practices.¹¹ Based on these interviews and reviews, we surveyed all federal, state, and other entities participating in selected regional interagency groups to identify coordination-related challenges, if any. We identified and sent surveys to 72 entities, of which 48 responded to our questionnaire, a response rate of 67 percent. To examine the extent to which federal and nonfederal entities have developed measurable goals and approaches to assess progress for San Francisco Bay Delta watershed restoration efforts, we reviewed regional plans and related goals and progress reports. We also interviewed officials from federal, state, and other entities, including scientific groups, about efforts to develop measurable goals and assess restoration progress.

To examine information on the status of San Francisco Bay Delta watershed restoration efforts and related expenditures for fiscal years 2007 through 2016, we obtained and analyzed available data from regional and state databases on projects, expenditures, and cost estimates for this period, which covers the time before and after the state withdrew from a key federal-state partnership,¹² and includes the last full fiscal year for which the most recent data were available at the time of our review. We assessed the reliability of these data by interviewing knowledgeable officials and reviewing database documentation and determined that they were not reliable for the purposes of identifying all restoration projects across the entire watershed and for reporting related

¹¹GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, DC: Sept. 27, 2012). For the purposes of this report, we use the terms collaboration and coordination interchangeably. The selection of our leading collaboration practices includes whether participating agencies have clarified roles and responsibilities, developed ways to continually update and monitor written agreements on how agencies coordinate, and identified how leadership will be sustained over the long-term.

¹²In 2009, the state of California withdrew from the originally structured partnership through which federal and state agencies had been collaborating on a CALFED Bay-Delta Program since 1995 (discussed below).

expenditure data. We also reviewed federal and state reports on budget requests and authority for that period and interviewed officials from federal, state, and other entities about available sources of data on projects, expenditures, and cost estimates. Specifically, we reviewed the Bay Delta budget crosscuts, which include financial information for San Francisco Bay Delta watershed restoration efforts reported by federal and state agencies, for fiscal years 2007 through 2019.¹³ We assessed the reliability of the data in the federal budget crosscut reports and tables by interviewing federal agency officials about which data they provided for the reports and tables and analyzing the data provided in the crosscut reports. We determined that the data were reliable only for reporting examples of the magnitude of funding for individual agencies. We determined that these data were not reliable to aggregate funding levels across programs and agencies or to compare funding levels of the various agencies. We discuss these issues further in this report. We also compared OMB's written guidance on submitting data for the crosscut reports with federal standards for internal control to assess the extent to which federal agencies followed the standard for design of control activities.¹⁴ We conducted site visits to four restoration projects, selected to provide illustrative examples of a variety of restoration activities in different locations in the watershed.

To determine key factors that may limit San Francisco Bay Delta watershed restoration, according to federal and nonfederal entities, we used our survey of federal, state, and other entities described above to obtain views on factors that may limit restoration progress. We also reviewed progress reports and studies exploring factors that may limit restoration progress. Appendix II contains more detailed information on the objectives, scope, and methodology of our review, and Appendix III contains a copy of the survey questionnaire we used for this review.

¹³OMB is required to submit a financial report annually to Congress, in coordination with the Governor of California and certified by the Secretary of the Interior, that includes, among other things, an interagency budget crosscut report. The crosscut report is to identify all expenditures since 1998 by the federal and state governments to achieve the objectives of a CALFED Bay-Delta Program, which include water quality and ecosystem restoration components. The crosscut report is also to contain a detailed accounting of all funds received and obligated by all federal and state agencies responsible for implementing the program during the past fiscal year. Calfed Bay-Delta Authorization Act, Pub. L. No. 108-361, § 106(c), 118 Stat. 1681, 1700 (2004).

¹⁴GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, DC: Sept. 10, 2014).

We conducted this performance audit from April 2017 to August 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

This section provides an overview of the (1) San Francisco Bay Delta watershed, (2) multiple water demands in the watershed, (3) selected laws and agreements related to restoration efforts in the watershed, and (4) funding for restoration efforts in the watershed.

San Francisco Bay Delta Watershed

The San Francisco Bay Delta watershed is a single, complex ecosystem covering more than 75,000 square miles, almost entirely in California. It includes a diversity of fresh, brackish, and salt water ecosystems.¹⁵ Figure 1 shows the watershed and its three major geographic areas and their subregions.

¹⁵Brackish water contains a mixture of fresh and salt water but is not as salty as seawater. It often results from the mixing of fresh and seawater.

Figure 1: San Francisco Bay Delta Watershed and Its Major Geographic Areas and Subregions



Source: GAO. | GAO-18-473

The watershed's three major geographic areas contain unique, yet inherently interconnected environmental and cultural features and face similar water quality and other threats:

- **San Francisco Bay and its local watershed (Bay).** The San Francisco Bay is the large body of mostly salt water through which the local watershed, as well as the entire Bay Delta watershed, drains into the Pacific Ocean.¹⁶ According to U.S. Census data, more than 7 million people live in the nine-county Bay area containing the local watershed—an area with one of the nation's densest populations. Large cities, such as San Jose, San Francisco, and Oakland; their suburbs, including Silicon Valley; and numerous other cities occupy much of the land surrounding the Bay. Since the California Gold Rush in the mid-1800s, most of the Bay's historical wetlands have been filled for development or converted to farmland or industrial salt ponds, and the loss of these natural features has removed important barriers for flood and erosion control.¹⁷ Because of its urban setting and location at the downstream end of the watershed, the Bay's water quality faces threats from numerous sources of pollution, including sewage, trash, urban and industrial runoff (e.g., metals, solvents, and inorganic chemicals), and runoff from agriculture and past mining activities upstream (e.g., nutrients, pesticides, and metals).
- **Sacramento-San Joaquin Delta (Delta).** The Sacramento-San Joaquin Delta comprises roughly 1,000 square miles where the fresh waters of the Sacramento and San Joaquin Rivers converge south of the city of Sacramento before flowing into the San Francisco Bay through a network of more than 50 islands. It is a largely rural area that is also home to more than 500,000 people living mostly on its suburban periphery, and its communities and farmland are protected from flooding by approximately 1,100 miles of levees. During the California Gold Rush, settlers diked the Delta's channels and waterways and began building levees to create dry land, resulting in the loss of nearly all of the original wetlands in the area.¹⁸ As a result,

¹⁶The Bay's local watershed includes the Suisun Bay and Marsh, which are located immediately east of the Bay and contain the largest contiguous brackish water marsh on the west coast of the United States. The Suisun Marsh is home to numerous species of birds and other wildlife, and much of its land is owned and managed by private hunting clubs.

¹⁷See The Bay Institute of San Francisco, *From the Sierra to the Sea*.

¹⁸See Delta Science Program, Delta Stewardship Council, *Challenges Facing the Sacramento-San Joaquin Delta: Complex, Chaotic or Simply Cantankerous?* (Sept. 28, 2015).

the Delta has been converted from an historic plain of seasonally flooded brackish and freshwater wetlands to a mosaic of channelized waterways surrounding its islands. According to reports, many of these islands have subsequently subsided up to 25 feet below sea level due largely to the use of groundwater and farming, which can cause the islands' rich peat soil to oxidize and erode.¹⁹ The Delta is a major outdoor recreation destination for activities such as fishing and boating. Its key water quality threats include agricultural, urban, and past mining runoff. In addition, the complex system of water supply infrastructure projects built throughout the watershed diverts fresh water from the Delta to other parts of the state, changing the saltwater content of much of the area's wetlands and marshes.

- **Upper watershed.** The upper watershed is the vast area where the watershed's rivers, streams, and tributaries originate at the crest of the Sierra Nevada and other mountain ranges and then travel hundreds of miles through California's Central Valley, the nation's most productive agricultural area, according to USDA. The upper watershed includes three subregions: the Sacramento River watershed in northern California, through which water generally flows south; the San Joaquin River watershed in central California, through which water generally flows west and then north; and the Tulare Lake Basin in southern California, through which water no longer drains naturally.²⁰ About 5 million people live throughout the area in a mix of rural and urban communities, including large inland cities, such as Fresno and Sacramento. In the upper watershed, the Sierra Nevada snowpack serves as temporary storage for roughly one-third to one-half of California's water, depending on the year. Most of the major rivers hold reservoirs to capture and store the snowmelt for longer-

¹⁹Land subsidence is the sinking or settling of land. The National Academy of Sciences has reported that more than 80 percent of the identified land subsidence in the United States is a consequence of the use of groundwater. See National Academy of Sciences, *Prospects for Managed Underground Storage of Recoverable Water* (Washington, DC: 2008). According to the U.S. Geological Survey, the increasing development of land and water resources threatens to exacerbate land subsidence problems and initiate new ones. In April 2016, we reported that land subsidence can damage infrastructure such as roads, pipelines, and aqueducts and is sometimes irreversible. See GAO, *Technology Assessment: Municipal Freshwater Scarcity: Using Technology to Improve Distribution System Efficiency and Tap Nontraditional Water Sources*, [GAO-16-474](#) (Washington, DC: Apr. 29, 2016).

²⁰Due to largescale water infrastructure development, the rivers in the Tulare Lake Basin no longer have a natural path to drain the basin. Instead, water moves in and out of the basin through precipitation and canals. Surface water from the Tulare Lake Basin only drains north into the San Joaquin River in years of extreme rainfall.

term use. As a result of mining, agriculture, and water infrastructure development, the area's historic water flows have been highly modified, the Central Valley's historic grasslands and flood plains have been converted to managed wetlands and are often threatened by land subsidence, and runoff from agriculture and past mining activities are dominant threats to water quality in low-lying areas. In the mountains and foothills, forest fires can threaten water quality, mostly by causing erosion that increases sediment in streams.

The Bay and Delta together form the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, often referred to as the Bay Delta, one of the largest estuaries in North America.²¹ The Bay Delta is the ecosystem created by the mixing of salt water from the Pacific Ocean and fresh water from the Sacramento and San Joaquin Rivers and their tributaries. It provides habitat for about 750 species of plants and animals, including more than 130 species of fish.²² It also contains more than 700,000 acres of farmland, and millions of users access it each year for recreational activities, such as hunting, boating, and fishing. In contrast to the managed wetlands of the upper watershed, the Bay Delta wetlands are tidal areas—brackish wetland influenced by the push and pull of ocean tides. Even with the tidal influence, the saltwater content of the Bay Delta is also heavily influenced by the amount of fresh water available, much of which is diverted by water supply infrastructure projects and can vary due to multiple water demands.

Multiple Water Demands in the Watershed

Because of the watershed's economic, environmental, and cultural importance, it has been the subject of political and legal battles over multiple water demands for decades. Beginning in the 1930s, federal and then state water projects—two complex networks of dams, pumps, reservoirs, canals, and other facilities—have diverted water from the Sacramento and San Joaquin Rivers to agricultural, industrial, and urban

²¹An estuary is the area where river and sea waters mix. Due to tidal flows, estuaries typically experience a continually changing blend of fresh and salt water. The term lower estuary is sometimes used to refer to the Bay, and upper estuary is sometimes used to refer to the Delta.

²²About 80 percent of California's commercial fishery species live in or migrate through the Delta, including several Chinook salmon runs. The Bay Delta is also home to a wide variety of introduced, non-native species of plants and animals, many of which threaten the habitats of native species.

consumers in the Bay area and southern parts of California.²³ The federal Central Valley Project primarily diverts water for agricultural use, and the California State Water Project, which was developed in the 1960s, primarily diverts water for drinking and industrial use.²⁴ Hundreds of water contractors, such as the Westlands Water District and the Metropolitan Water District of Southern California, purchase water from these projects, which can divert about 20 to 70 percent of the natural water flowing into the Bay Delta, depending on legal limits and seasonal levels of precipitation.²⁵

Other water demands include habitat needs for threatened and endangered species such as the Delta smelt (a fish) and various salmon species. In particular, federal agencies have developed instream flow requirements for these species of fish that require water to be released from dams upstream to help maintain adequate water quality and temperature for the fish. As a result, most of the water in the watershed is managed by federal, state, and local water projects for use by private and investor-owned water agencies and districts and their customers, as well as for fish and habitat purposes. Any proposed changes to this complicated water allocation system—which accounts for California’s

²³In addition to the federal and state water projects, a number of local water projects divert water in the watershed, according to EPA. Some of these projects—such as San Francisco’s project on the Tuolumne River and the East Bay Municipal Utility District project on the Mokelumne River—are significant diverters for municipal users in the Bay area. Others, including the Yuba County Water Agency on the Yuba River and numerous diverters on the San Joaquin River tributaries, serve primarily local agricultural and municipal needs. Collectively, these upstream diversions constitute a significant reduction in inflows to the Bay and Delta, according to EPA.

²⁴The Central Valley Project was originally designed to provide irrigation and municipal water, improve navigation and flood control, and generate power. Reclamation administers the Central Valley Project, and the California Department of Water Resources, a state agency, administers the State Water Project.

²⁵Westlands Water District provides water to about 700 farms comprising approximately 600,000 acres in western Fresno and Kings Counties, California. The farms produce dozens of crops worth approximately \$1 billion annually. The district’s water delivery system includes 1,034 miles of pipes. It is the largest agricultural water district in the United States. The Metropolitan Water District of Southern California is a regional wholesaler that delivers water to 26 member public agencies—14 cities, 11 municipal water districts, and 1 county water authority—that then provide water to 19 million people in six southern California counties. To supply more than 300 cities and unincorporated areas with water, the district owns and operates an extensive water system that includes the Colorado River Aqueduct, 16 hydroelectric facilities, nine reservoirs, 819 miles of pipes, and five water treatment plants. It is the largest distributor of treated drinking water in the United States.

largest supply of fresh water—often raise concerns among water users about losing water, receiving reduced priority for water supplies, or obtaining water of poor quality. For example, according to one study, the state of California has allocated more water rights than what could be available naturally.²⁶ Other concerns involve the system’s infrastructure—the system depends largely on a complex network of aging levees, many of which were first built in the mid-1800s—and the possible effects on water supply and quality. Specifically, earthquakes, floods, subsidence, or sea level rise could cause these levees to fail and put the state’s fresh water supply at risk from saltwater contamination. As a result of these and other concerns, many stakeholders in the watershed have been, and continue to be, involved in legal actions over multiple water demands.²⁷

Selected Laws and Agreements Related to Restoration Efforts in the Watershed

Construction and operation of the Central Valley Project and the State Water Project has fundamentally altered the physical environment of the Bay, Delta, and parts of the upper watershed, where nearly every tributary has been dammed to create reservoirs to supply these water projects. By the late 1980s, species decline and water quality problems became so critical in the Bay Delta that stakeholders raised concerns that the continued operation of these projects might be conflicting with federal and state water quality and endangered species laws (discussed below).²⁸

In 1992, the Central Valley Project Improvement Act amended the Central Valley Project authorizations, which previously focused primarily on certain uses such as irrigation and power generation.²⁹ The act specifies, among other things, a number of actions for the purposes of protecting, restoring, and enhancing fish, wildlife, and associated habitats in the

²⁶Theodore E. Grantham and Joshua H. Viers, “100 Years of California’s Water Rights System: Patterns, Trends and Uncertainty,” *Environmental Research Letters*, vol. 9, no. 8 (2014).

²⁷Stakeholders could include the federal and nonfederal entities discussed in this report, in addition to others affected by restoration efforts in the watershed, including policymakers, property owners, and businesses.

²⁸In 1993 a federal appellate court held that Reclamation was authorized to include provisions in renewed water contracts that require, under certain circumstances, Endangered Species Act consultation and possible subsequent contract modifications. *Madera Irrigation Dist. v. Hancock*, 985 F.2d 1397, 1400, 1405 (9th Cir. 1993).

²⁹Central Valley Project Improvement Act, Pub. L. No. 102-575, title XXXIV, 106 Stat. 4600, 4706 (1992).

Central Valley and Trinity River basins in California. The act's stated purposes include, among other things, to achieve a reasonable balance among competing demands for use of Central Valley Project water, including the requirements of fish and wildlife, agriculture, municipal and industrial and power contractors. Under the act, Reclamation implements several programs, including those to restore habitat on Central Valley rivers and streams, improve diversion facilities to protect certain juvenile fish, and deliver water supplies for critical wetland habitat supporting resident and migratory waterfowl and threatened and endangered species.³⁰

To address the increasingly complex issues surrounding the Bay Delta, the federal and California state governments reached an agreement to create the CALFED Bay-Delta Program (CALFED) in 1995 to restore ecological health, improve water quality, fortify water management infrastructure, and increase water supply reliability.³¹ From 1995 through 2009, about 20 federal and state agencies collaborated through this program, issuing a record of decision in 2000 outlining CALFED goals and programs and implementing federal and state legislation enacted in the early 2000s.³² Under the National Environmental Policy Act of 1969, agencies issue a record of decision at the end of the environmental

³⁰In 1994, a federal court vacated an injunction prohibiting federal agency implementation of the Central Valley Project Improvement Act. The court held that the plaintiff water districts had shown no likelihood of success in their suit alleging that federal agencies were required to prepare an environmental impact statement under the National Environmental Policy Act before implementing the Central Valley Project Improvement Act. *Westlands Water Dist. v. Natural Resources Defense Council*, 43 F.3d 457, 461-62 (9th Cir. 1994).

³¹California state law refers to the CALFED Bay-Delta Program, while federal law refers to the Calfed Bay-Delta Program. For the purposes of this report, we use CALFED.

³²See Calfed Bay-Delta Authorization Act, Pub. L. No. 108-361, title I, 118 Stat. 1681, 1681 (2004); California Bay-Delta Act, 2002 Cal. Stat. 5192; CALFED Bay-Delta Program, *Programmatic Record of Decision* (August 28, 2000).

impact statement process, which they are required to conduct for major federal actions that have a significant effect on the environment.³³

The 2000 record of decision established a program with 12 components, including water quality and ecosystem restoration, to be managed by state and federal agencies.³⁴ According to the record of decision, CALFED's water quality goal was to provide good water quality for the millions of Californians who rely on the Delta for all or a part of their drinking water. CALFED's goal for ecosystem restoration under the record of decision was to improve aquatic and terrestrial habitats and natural processes to support stable, self-sustaining populations of diverse and valuable plant and animal species through an adaptive management process. This process includes reevaluating or updating goals, activities, or performance measures based on the results of ongoing monitoring and progress assessments. Under the record of decision, the water quality and ecosystem restoration programs include activities throughout the Bay, Delta, and upper watershed.

In 2002, California enacted the California Bay-Delta Act, which established the California Bay-Delta Authority to oversee CALFED.³⁵ In 2004, the Calfed Bay-Delta Authorization Act (CALFED Act), a federal law, implemented the record of decision, directed federal agencies to coordinate CALFED activities with California state agencies, and

³³National Environmental Policy Act of 1969, Pub. L. No. 91-190, 83 Stat. 852 (1970). After preparing the environmental impact statement, agencies issue a record of decision, which must state what the agency decision was; identify all alternatives considered by the agency in reaching its decision, specifying the alternative or alternatives that were considered to be environmentally preferable; and state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. The record of decision for the CALFED Bay-Delta Final Programmatic Environmental Impact Statement and Report represents the culmination of processes under the National Environmental Policy Act of 1969 and the California Environmental Quality Act, which requires state agencies to prepare environmental impact reports. According to the record of decision, it reflected a final selection of a long-term plan that included specific actions to fix the Bay-Delta, described a strategy for implementing the plan, and identified complementary actions the CALFED agencies would pursue.

³⁴The 12 program components are governance, ecosystem restoration, watersheds, water supply reliability, storage, conveyance, environmental water account, water use efficiency, water quality, water transfers, levees, and science.

³⁵See California Bay-Delta Act, 2002 Cal. Stat. 5192. The California Bay-Delta Authority was comprised of state and federal agency representatives (if authorized to participate), public members, a member of the Bay-Delta Public Advisory Board, ex-officio legislative members, and members at large. 2002 Cal. Stat. 5196.

authorized federal agencies to participate in the California Bay-Delta Authority as nonvoting members for the full duration of the period it continued to be authorized by state law.³⁶ CALFED received federal appropriations to develop and implement ecosystem protection and restoration projects.³⁷ Section 105 of the act requires Interior to report annually on the accomplishments of various program components, including those related to additional water storage and ecosystem restoration. Section 106 of the act requires OMB, in coordination with the governor of California, to report annually on all expenditures since 1998 to achieve the program's objectives.

However, in 2009, California repealed the California Bay-Delta Act and abolished the California Bay-Delta Authority, replacing it with the Delta Reform Act and the Delta Stewardship Council.³⁸ The 2009 law focused state efforts more specifically on the Delta, in part by tasking the council with developing an enforceable Delta Plan for promoting a healthy Delta ecosystem and a more reliable water supply.³⁹ According to a report by the California Legislative Analyst's Office, the CALFED federal-state partnership ended due to several challenges, including uncertain financing, weak governance, and a lack of accountability.⁴⁰ Although California state law was amended in 2009, the federal CALFED Act has not been significantly amended since its enactment in 2004.

³⁶Calfed Bay-Delta Authorization Act, Pub. L. No. 108-361, title I, 118 Stat. 1681, 1681 (2004).

³⁷In 1996, CALFED was initially authorized to receive federal funding for fiscal year 1998 through fiscal year 2000. California Bay-Delta Environmental Enhancement and Water Security Act, Pub. L. No. 104-208, Div. E, § 102(a), 110 Stat. 3009, 3009-748 (1996). After fiscal year 2000, generally only certain projects supporting CALFED goals received appropriations. In 2004, as noted previously, the CALFED Act was enacted to implement the 2000 record of decision; annual appropriations acts have provided funding for CALFED since.

³⁸See Sacramento-San Joaquin Delta Reform Act of 2009, 2009 Cal. Stat. 5415 (codified as amended at CAL. WATER CODE §§ 85000-85350).

³⁹The Delta Plan set forth 87 provisions for various entities, such as local, state, and federal agencies. Fourteen of these provisions are legally enforceable regulatory policies, and to demonstrate compliance with these policies, for covered actions, project proponents are to certify compliance with lead state agencies identified under the California Environmental Quality Act.

⁴⁰California Legislative Analyst's Office, *Achieving State Goals for the Sacramento-San Joaquin Delta* (January 2015). See also, California Little Hoover Commission, *Still Imperiled, Still Important: The Little Hoover Commission's Review of the CALFED Bay-Delta Program* (November 17, 2005).

As we reported in June 2015, although the CALFED record of decision remains in effect, the state's future direction for Bay Delta activities are likely to be coordinated through the Delta Plan.⁴¹ The Delta Plan was, under certain conditions, to incorporate a 50-year conservation plan initiated by the state, in cooperation with Reclamation, in 2006.⁴² The 50-year plan proposed restoring approximately 150,000 acres of wetlands, grasslands, and other areas in and around the Delta over 50 years and addressing water supply reliability concerns by building two large tunnels to transport fresh water under the Delta.⁴³ In 2015, facing uncertainties in obtaining permits to implement the plan, the state replaced the 50-year plan with two separate initiatives managed by the California Natural Resources Agency: (1) California EcoRestore, which aims to begin restoring at least 30,000 Delta acres over 5 years, and (2) California WaterFix, which includes building the two tunnels from the 50-year plan.⁴⁴ The ecosystem chapter of the Delta Plan is being amended, and the amended chapter is anticipated to be complete by early 2019, according

⁴¹GAO, *Bureau of Reclamation: Financial Information for Three California Water Programs*, [GAO-15-468R](#) (Washington, DC: June 4, 2015).

⁴²According to a Delta Stewardship Council report, California's current water management infrastructure is decaying and overburdened, thus increasing the risk of catastrophe. Specifically, the report found that multiple levee breaks would allow saltwater into the Delta, threatening agricultural crops and urban water supplies. See Delta Science Program, *Challenges Facing the Sacramento-San Joaquin Delta*.

⁴³The 50-year plan proposed constructing three new freshwater intake facilities on the Sacramento River, at the northern end of the Delta, and two 40-foot wide, 35-mile long tunnels located about 150 feet underground to transport that water to existing freshwater delivery facilities at the southern end of the Delta.

⁴⁴The 50-year plan proposed providing for a long-term Habitat Conservation Plan under Section 10 of the Endangered Species Act. California EcoRestore and California WaterFix propose fewer conservation measures under Section 7 of the Endangered Species Act. Under the state's Delta Reform Act, the 50-year plan, known as the Bay Delta Conservation Plan, is not to be incorporated into the Delta Plan unless it meets certain requirements, including being approved as a Habitat Conservation Plan under the federal Endangered Species Act.

to Delta Stewardship Council officials.⁴⁵ While it does not directly incorporate EcoRestore, the Delta Plan ecosystem amendment currently under development acknowledges that EcoRestore's successful implementation is needed to achieve the restoration objectives in the Delta Reform Act, according to Delta Stewardship Council officials.

In addition to the CALFED Act and the Central Valley Project Improvement Act, other federal laws, including water quality and endangered species laws, are relevant to restoration efforts in the watershed. Some relevant laws include the following:

- **The Clean Water Act.** The objective of this act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.⁴⁶ A 1987 amendment to the act created the National Estuary Program to promote comprehensive planning for, and conservation and management of, estuaries of national significance.⁴⁷ The National Estuary Program calls for the development of comprehensive conservation and management plans (CCMP) for these designated estuaries, including the Bay Delta estuary, which was designated

⁴⁵California is developing the Delta Conservation Framework, which it expects to complete in 2018 and which will guide the state's Delta conservation efforts to 2050. According to the California Natural Resources Agency, the Delta Conservation Framework is a high-level conservation framework for the Delta, Yolo Bypass, and Suisun Marsh and will serve as the long-term continuation of California EcoRestore. The draft Delta Conservation Framework includes at least 17 state planning documents, ranging from the statewide California Water Action Plan to species-specific plans, such as the Tri-colored Blackbird Conservation Plan. According to Delta Stewardship Council officials, while there is no formal connection between the Delta Conservation Framework and the Delta Plan, the framework will help inform the Delta Plan ecosystem amendment.

⁴⁶Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, § 2, 86 Stat. 816 (codified as amended at 33 U.S.C. §§ 1251-1387) (commonly referred to as the Clean Water Act).

⁴⁷Water Quality Act of 1987, Pub. L. No. 100-4, § 317, 101 Stat. 7, 61 (1987) (codified as amended at 33 U.S.C. § 1330). Currently, 28 estuaries are designated as estuaries of national significance, according to EPA's website, available at <https://www.epa.gov/nep/overview-national-estuary-program>, as of February 2018.

under the program in 1987.⁴⁸ Under the act, EPA also works with California to regulate water quality. In addition, section 404 of the Clean Water Act generally prohibits the discharge of dredged or fill material into waters of the United States without a permit from the Corps.⁴⁹ The Corps administers the permitting responsibilities of the section 404 program while EPA develops, in conjunction with the Corps, the substantive environmental criteria that permit applicants must meet.

- **The Endangered Species Act.** This act was enacted to, among other things, provide a means to conserve the ecosystem upon which endangered species and threatened species depend and to provide a program for the conservation of such endangered species and threatened species.⁵⁰ Under the act, species may be listed as endangered or threatened.⁵¹ Several species in the watershed are listed as threatened or endangered, including the Delta smelt, steelhead trout, spring- and winter-run Chinook salmon, Ridgway's rail (a bird), salt marsh harvest mouse, red-legged frog, and California tiger salamander. NOAA's National Marine Fisheries Service and the U.S. Fish and Wildlife Service, depending on the species, implement the act, including by issuing biological opinions regarding the potential

⁴⁸33 U.S.C. § 1330. Under the Clean Water Act, management conferences are to be convened for the purpose of, among other things, developing a CCMP that recommends priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected. Another purpose of a management conference convened under the act is to develop plans for the coordinated implementation of the plan by the states as well as federal and local agencies participating in the conference. 33 U.S.C. § 1330(b)(4), (5). A management conference is to include, at a minimum, the Administrator of the EPA and representatives from certain federal, state, and local entities, as well as other entities, including foreign nations or international entities and affected industries and education institutions. 33 U.S.C. § 1330(c).

⁴⁹33 U.S.C. § 1344.

⁵⁰Endangered Species Act of 1973, Pub. L. No. 93-205, 87 Stat. 884 (1973) (codified as amended at 16 U.S.C. §§ 1531-1544).

⁵¹Endangered generally means a species is in danger of extinction throughout all or a significant portion of its range, while threatened means a species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. See 16 U.S.C. § 1532(6), (20).

effects of proposed federal actions on endangered and threatened species.⁵²

- **The San Joaquin River Restoration Settlement Act.** In conjunction with the settlement this act implements, it outlines, among other things, measures to achieve the goals of restoration of the San Joaquin River and the successful reintroduction of California Central Valley spring-run Chinook salmon.⁵³ Under the act, Reclamation is to coordinate several actions, including the expansion of a segment of the San Joaquin River to provide habitat for juvenile salmon.

Funding for Restoration Efforts in the Watershed

Across the watershed, funding for restoration efforts typically comes from a variety of federal, state, local, nongovernmental, and private entities. According to Interior officials, federal funding includes approximately \$37 million per year for CALFED overall and additional funding for implementation of the Central Valley Project Improvement Act, available for certain projects in the Delta and upper watershed. Also, according to Interior officials, the U.S. Geological Survey funds research and monitoring to support water quality management, water operations, and restoration. Additional federal sources of funding include grant programs from EPA, NOAA, and the U.S. Fish and Wildlife Service and projects funded through Reclamation, in addition to funding for water projects that can include a restoration component. For example, Reclamation has provided about \$37 million annually since fiscal year 2015 for the San Joaquin River Restoration Program. A number of other federal entities, including USDA's Natural Resources Conservation Service, also fund restoration projects in the watershed. For example, USDA's Natural Resources Conservation Service has programs, such as the Environmental Quality Incentives Program and the Agricultural

⁵²The U.S. Fish and Wildlife Service has primary responsibility for freshwater and terrestrial species, while NOAA's National Marine Fisheries Service has primary responsibility for most marine species and anadromous fishes, which spend portions of their life cycle in both fresh and salt water.

⁵³San Joaquin River Restoration Settlement Act, Pub. L. No. 111-11, title X, subtit. A, pt. I, 123 Stat. 991, 1349 (2009). The San Joaquin River Restoration Settlement Act authorizes and directs federal agencies to implement a settlement of an 18-year lawsuit between, among others, the U.S. Departments of the Interior and Commerce, the Natural Resources Defense Council, and the Friant Water Users Authority. The settlement received federal court approval in October 2006.

Conservation Easement Program, to support farm conservation efforts throughout the Central Valley.⁵⁴

Funding from state sources primarily comes from state water and conservation agencies and is funded through statewide bonds and the state's general fund. For example, in 2014, California voters authorized \$7.5 billion in bonds to fund ecosystems and watershed protection and restoration; water supply infrastructure projects, including surface and groundwater storage; and drinking water protection across the state, including the San Francisco Bay Delta watershed. In addition to the bond funding, in 2016, voters from nine Bay area counties authorized an annual \$12 parcel tax that is expected to raise approximately \$500 million over 20 years for Bay wetlands restoration, as well as other multi-benefit projects.⁵⁵

In the Delta, in addition to federal and state funding for restoration efforts, according to state officials, funding often comes from water contractors that pay for major restoration efforts through their obligations under the State Water Project to address biological opinions issued by federal regulatory agencies for endangered or threatened species.⁵⁶ For example, water contractors are responsible for funding restoration efforts under the state's California EcoRestore initiative, including at least \$205 million to restore 8,000 acres of fish habitat and \$171 million for 17,000 acres of floodplain improvements. EcoRestore began in 2015, and total costs for projects are expected to reach at least \$300 million in the initiative's first 4 years, according to the California Natural Resources Agency.

⁵⁴See GAO, *Agricultural Conservation: USDA's Environmental Quality Incentives Program Could Be Improved to Optimize Benefits*, [GAO-17-225](#) (Washington, DC: Apr. 13, 2017).

⁵⁵The San Francisco Bay Restoration Authority is a regional agency responsible for managing the funding made available through this parcel tax.

⁵⁶Under the Endangered Species Act, federal agencies must consult with NOAA or the U.S. Fish and Wildlife Service, depending on the affected species, to ensure that their proposed actions are not likely to jeopardize the continued existence of species listed as endangered or threatened, or result in the destruction or adverse modification of designated critical habitat. During formal consultation, NOAA or the U.S. Fish and Wildlife Service are to produce a biological opinion on whether the agency action is likely to jeopardize listed species or result in the destruction or adverse modification of designated critical habitat. Biological opinions that determine that a proposed action would jeopardize listed species, or destroy or adversely modify critical habitat, are to include reasonable and prudent alternatives to the proposed action, which enables an action to continue while remaining consistent with the act's requirements for protecting species and their habitat.

According to officials from several federal and nonfederal entities, including EPA and the San Francisco Estuary Partnership, no official estimates exist for the expected total future costs to restore the entire watershed, though some estimates have been developed for limited types of activities. For example, regarding cost estimates, the San Francisco Estuary Partnership typically refers to Save the Bay's 2007 *Greening the Bay* report, which estimates that it will cost almost \$1.5 billion over 50 years to restore the 36,176 acres of Bay shoreline already set aside for restoration.⁵⁷ Overall, according to related reports, investments on the order of tens of billions of dollars would likely be necessary to restore the entire watershed.

Federal and Nonfederal Entities Coordinate Comprehensive Restoration Efforts in Specific Geographic Areas, but Federal Entities Do Not Coordinate Across the Watershed

Federal and nonfederal entities, including state agencies and nongovernmental organizations, carry out and coordinate a wide range of restoration efforts in the watershed. These entities coordinate comprehensive restoration efforts in the Bay and Delta primarily through two coordinating bodies—the San Francisco Estuary Partnership and the Delta Plan Interagency Implementation Committee, respectively. In the upper watershed, federal and nonfederal entities do not have a coordinating body for comprehensive restoration efforts, but they do coordinate restoration efforts through plans specific to entities, projects, or restoration topics. In 2009, federal entities first developed an Interim Federal Action Plan for coordinating federal restoration efforts across the entire watershed, but not all of the entities are using the plan.

Federal and Nonfederal Entities Carry Out A Wide Range of Restoration Efforts in the Watershed

Federal and nonfederal entities carry out a wide range of restoration efforts—i.e., water quality improvement and ecosystem restoration—that can involve multiple entities, vary in geographic scope, span multiple years, and are intended to achieve multiple benefits. According to our review of reports and interviews with officials from federal and nonfederal entities, water quality improvement efforts include projects intended to improve the physical, chemical, or biological characteristics of water, and ecosystem restoration efforts include projects to restore degraded habitats. According to these interviews, restoration efforts can target a

⁵⁷Save the Bay, *Greening the Bay: Financing Wetland Restoration in San Francisco Bay* (Oakland, CA: 2007).

range of priorities, including conservation, resiliency, mitigation, monitoring, and enhancement.⁵⁸ In addition, these efforts can directly or indirectly support water quality improvement and ecosystem restoration goals and objectives, and they can encompass a variety of activities, such as planning, project selection, project implementation, permitting, funding, technical assistance, and assessment. Figure 2 shows the locations and different habitat types for a number of the completed and ongoing restoration projects implemented by federal and nonfederal entities—partly under the CCMP, California EcoRestore, and other efforts—in the Bay Delta Estuary.

⁵⁸Conservation efforts include projects or other activities intended to conserve or protect lands for biodiversity, microclimate, soil, wetlands, or watershed use. Resiliency efforts include projects or other activities that allow natural ecological processes to continue functioning in the changing climate. Mitigation efforts include projects or other activities intended to minimize or compensate for impacts due to human usage and ongoing water programs, typically in response to regulation. Monitoring efforts include projects or other activities intended to monitor watershed characteristics, including for the purposes of establishing baselines for, identifying trends for, and assessing restoration activities. Enhancement efforts include projects or other activities that reestablish ecological processes while obtaining function from these activities for human use, such as reestablishing wetlands that serve as flood control for urban development and recreation.

Figure 2: Locations and Habitat Types for a Number of the Completed and Ongoing Restoration Projects in the San Francisco Bay Delta Estuary Since 1976



Source: GAO analysis of EcoAtlas data. | GAO-18-473

Note: Figure shows project acreage, locations, and general habitat types for 404 completed and ongoing restoration projects, as of April 24, 2018, implemented by federal and nonfederal entities on 99,884 acres in the San Francisco Bay Delta Estuary, which comprises the San Francisco Bay and its local watershed and the Sacramento-San Joaquin Delta.

Restoration efforts in the watershed can involve multiple levels of government, as well as nongovernmental organizations. For example, the South Bay Salt Pond Restoration Project near San Jose, California—the largest tidal wetland restoration project on the west coast of the United States, according to the project’s website—is a joint effort among the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and the California State Coastal Conservancy, along with local governments, donors, consultants, and other participants. Similarly, the Hamilton Wetland Restoration Project near Novato, California, which involves the restoration of tidal and seasonal wetlands, is a joint effort among the Corps, California State Coastal Conservancy—the nonfederal sponsor and landowner—and other federal and nonfederal entities.

Restoration efforts in the watershed also vary in geographic scope and can span jurisdictions. The South Bay Salt Pond Restoration Project includes federal and state land and, according to the project’s website, is expected to restore more than 15,000 acres of industrial salt ponds to tidal marsh and other wetland habitats in three counties located along the shores of the southern part of San Francisco Bay. (See fig. 3.)

Figure 3: Wetland Restoration Project on the Site of Former Industrial Salt Ponds near San Jose, California, along San Francisco Bay



Source: GAO. | GAO 18-473

Note: Photo shows natural tidal marsh (left) and a former industrial salt pond (right) set aside for restoration.

The Hamilton Wetland Restoration Project comprises state-owned land and, according to the California State Coastal Conservancy, has the purpose to restore approximately 2,600 acres to tidal wetland on a former army airfield and adjacent properties along the San Francisco Bay in an area 25 miles north of San Francisco. (See fig. 4.)

Figure 4: Wetland Restoration Project on the Site of the Former Hamilton Army Airfield in Novato, California, along San Francisco Bay



Source: GAO. | GAO-18-473

Notes: Photo shows site of former Army airfield (including nearly all water and land pictured, except the mountains) where, according to the California State Coastal Conservancy, between 2008 and 2013, approximately 6 million cubic yards of dredged sediment, primarily from a project to deepen the Port of Oakland, was placed to raise the land surface to elevations suitable for creating tidal marsh. According to the conservancy, this entailed the largest beneficial reuse of dredged sediment—which would have otherwise been disposed of in the bay or ocean—that had ever occurred at a wetland restoration site. In the late 19th century, marshes at the site had been diked and dried out, and decades of farming left subsided land at an elevation too low for tidal wetland plants to become established. In 2014, according to the conservancy, the bayfront levee was breached (see arrow), connecting the former airfield property to the bay for the first time in more than 100 years and enabling the process of ecological succession to tidal marsh.

In contrast, other efforts include project areas on farms. For example, under its Environmental Quality Incentives Program, USDA's Natural Resources Conservation Service has focused on providing conservation planning, among other services, for farm operators and nonindustrial forestland owners, including tribes. Officials from several federal and nonfederal entities, including EPA, the San Francisco Estuary Partnership, the Central Valley Joint Venture, and the California State Coastal Conservancy, stated that the primary focus of restoration efforts varied from one geographic area to another. For example, according to some of these officials, efforts to restore tidal wetlands are prevalent in

the Bay, and efforts to address land subsidence are prevalent in the Delta. (See fig. 5.)

Figure 5: Levee and Subsided Agricultural Land on Twitchell Island, California, in the Sacramento-San Joaquin Delta



Source: GAO. | GAO-18-473

Notes: Photo shows a road on top of a levee (pictured on the left) along the San Joaquin River bank on Twitchell Island, which includes vast areas of subsided (i.e., sunken or settled) agricultural land (pictured on the right) 15 to 25 feet below sea level. The island includes a 15-acre subsidence research facility (not shown) where, since 1997, the California Department of Water Resources has monitored the effects of growing tules—native plants that grow 3 to 10 feet tall with thick, rounded green stems—including land surface elevation changes and carbon sequestration. The island also includes a 750-acre restored wetland (not shown), which, according to state officials, the department constructed in 2013 and which surrounds the 15-acre subsidence research facility. The island also includes a 600-acre project (not shown), initiated in 2008, where the department researches rice production's effect on sequestering carbon and stopping subsidence.

Restoration efforts in the watershed can span multiple years. For example, the South Bay Salt Pond Restoration Project is an ongoing, multi-phase, 50-year effort that began with the acquisition of former industrial salt ponds in 2003. Likewise, the Hamilton Wetland Restoration Project is an ongoing, multi-phase effort that began in 1999. In the upper watershed, planning began in 2012 for California EcoRestore's ongoing Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project,

which aims to increase floodplain habitat for endangered and threatened fish species in the Sacramento River watershed.

Restoration efforts in the watershed can also have multiple primary benefits. For example, the Hamilton Wetland Restoration Project was designed to reverse years of land subsidence, restore wetlands, reestablish historic habitat for wildlife and endangered species, and beneficially reuse dredged sediment. Multiple benefits could also accrue over time. For instance, according to the California State Coastal Conservancy, while the Hamilton Wetland Restoration Project currently provides habitat for migratory water birds and fish, it is expected to become thickly vegetated with a complex network of tidal channels that provide habitat for several threatened and endangered species. Restoration efforts can also provide multiple secondary benefits. For example, restoring wetlands may provide resilience against sea level rise, habitat for wildlife, and an area for recreation.

Federal and Nonfederal Entities Coordinate Comprehensive Restoration Efforts in the Bay and Delta through Coordinating Bodies and Specific Restoration Efforts in the Upper Watershed

Federal and nonfederal entities coordinate comprehensive restoration efforts in the Bay and Delta through the San Francisco Estuary Partnership and the Delta Plan Interagency Implementation Committee, respectively. In the upper watershed, federal and nonfederal entities coordinate specific restoration efforts through plans specific to entities, projects, or restoration topics. Specifically:

- **Bay.** In the Bay, federal and nonfederal entities coordinate comprehensive restoration efforts through the San Francisco Estuary Partnership.⁵⁹ The partnership was established in 1987 and receives funding from EPA's National Estuary Program to implement the CCMP for the San Francisco Estuary (i.e., the Bay Delta). The partnership's members include federal, state, and local government entities; nongovernmental organizations, such as conservation groups; and a utility commission.⁶⁰ The partnership's members provided input on developing and revising the CCMP and have

⁵⁹The San Francisco Estuary Partnership is operated by the Association of Bay Area Governments—a voluntary regional planning agency with members representing local governments in the nine-county Bay area.

⁶⁰Among the 38 members of the San Francisco Estuary Partnership's implementation committee, federal entities are the Corps, EPA, NOAA, USDA, and the U.S. Fish and Wildlife Service. The five members of the CCMP executive council include EPA and the U.S. Fish and Wildlife Service.

integrated goals into the CCMP from their own topic- or entity-specific strategic plans. Partnership members also coordinate restoration efforts guided by the CCMP. For example, the U.S. Fish and Wildlife Service, U.S. Geological Survey, the California State Coastal Conservancy, and the California Department of Fish and Wildlife work to coordinate on managed wetlands and ponds—one of the restoration efforts outlined in the CCMP. Furthermore, partnership members may carry out various activities for restoration projects in the Bay, such as project planning, regulating and permitting (e.g., for dredging and extracting sediment), on-the-ground project implementation, and scientific monitoring. Partnership members meet quarterly and participate in a conference every 2 years to provide updates on the status of projects, share scientific research, and present monitoring results.⁶¹

- **Delta.** In the Delta, federal and nonfederal entities coordinate comprehensive restoration efforts through the Delta Plan Interagency Implementation Committee. This committee was created in 2013 by the Delta Stewardship Council, the state agency responsible for overseeing the Delta Plan—the state’s plan for promoting a more reliable water supply and a healthy ecosystem.⁶² The committee is made up of representatives from 7 federal and 11 state entities and helps implement the Delta Plan.⁶³ Members of the committee may also carry out various activities for restoration projects in the Delta, such as scientific monitoring, on-the-ground project implementation, project planning, and regulating and permitting (e.g., for placing materials such as concrete structures or rocks into the water to support levees). The committee meets twice a year and participates in conferences to gather scientific consensus or to share recent research. Some committee members are also members of the San

⁶¹While the San Francisco Estuary Partnership’s planning area includes both the Bay and Delta, the partnership has historically only focused on activities in the Bay, according to a partnership official. According to officials from the Delta Stewardship Council, entities in the two regions did not coordinate in the past because the regions had different funding sources and faced different restoration challenges. However, according to an official of the San Francisco Estuary Institute, entities doing restoration work in the Bay are now making efforts to coordinate with entities that do restoration work in the Delta.

⁶²As noted previously, in 2009, California repealed the California Bay-Delta Act—its CALFED authorization act—and replaced it with the Delta Reform Act, which created the Delta Stewardship Council and charged it with establishing and overseeing a committee of agencies responsible for implementing the Delta Plan.

⁶³The 7 federal entities are the Corps, EPA, Interior, NOAA, Reclamation, U.S. Fish and Wildlife Service, and the U.S. Geological Survey.

Francisco Estuary Partnership and coordinate separately through initiatives that may have predated the committee and that are specific to entities, projects, or restoration topics.

- **Upper watershed.** In the upper watershed, while federal and nonfederal entities do not have a coordinating body for comprehensive restoration efforts, they coordinate restoration efforts through plans specific to entities, projects, or restoration topics. For example, 20 federal, state, and nongovernmental entities coordinate through the Central Valley Joint Venture—a partnership with the mission to conserve migratory bird habitat—and its implementation plan. Likewise, dozens of federal, state, and local government entities coordinate to implement the Central Valley Flood Protection Plan, a plan adopted by California’s Central Valley Flood Protection Board for managing flood risk.⁶⁴ In addition, NOAA, the U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife coordinate on implementing a conservation strategy in parts of the Central Valley.⁶⁵

Federal Entities Developed a Plan for Coordinating Federal Restoration Efforts across the Watershed, but Not All of the Entities Are Using the Plan

A federal memorandum of understanding and an Interim Federal Action Plan outline how federal entities are to coordinate the federal government’s restoration activities and support state efforts across the entire watershed. The California Bay-Delta Memorandum of Understanding among Federal Agencies, signed in September 2009, established a Federal Bay-Delta Leadership Committee to coordinate federal efforts related to restoration and water management across the entire watershed while the state structure was transitioning from the California Bay-Delta Authority to the Delta Stewardship Council, and the state therefore was no longer participating in the originally structured CALFED federal-state partnership.⁶⁶ According to the memorandum, this

⁶⁴California Department of Water Resources, *Central Valley Flood Protection Plan: 2017 Update* (August 2017).

⁶⁵Ecosystem Restoration Program, California Department of Fish and Wildlife, NOAA, and the U.S. Fish and Wildlife Service, *Conservation Strategy for Restoration of the Sacramento-San Joaquin Delta, Sacramento Valley and San Joaquin Valley Regions* (May 2014).

⁶⁶Six federal entities—Interior, CEQ, USDA, EPA, the Corps, and the Department of Commerce—signed the *California Bay-Delta Memorandum of Understanding among Federal Agencies* on September 29, 2009. The memorandum stated that it would remain in effect for a period of 5 years from the date all parties signed it and may be extended or modified at any time upon the mutual written consent of the parties. According to CEQ officials, the memorandum expired in 2014 and has not been extended.

federal committee was to be led by Interior and CEQ and to meet regularly. The signatories of the memorandum also agreed to develop a federal work plan to outline near-term federal actions and begin to identify and prioritize key longer-term federal actions for restoration efforts and water management across the watershed. The entities issued an Interim Federal Action Plan in December 2009.⁶⁷

The Interim Federal Action Plan organizes federal actions into four priorities, including working with state and local authorities on joint project planning to ensure healthy Bay Delta ecosystems and to improve water quality.⁶⁸ Specifically, the federal entities agreed to build projects to improve water supply, including through conservation efforts in municipal areas and on agricultural lands; to fund habitat restoration projects for threatened and endangered fish across the watershed; and to assess the effects of pollutants such as mercury and pesticides on water quality. According to the Interim Federal Action Plan, these priorities cut across different federal entities' missions and activities in the watershed. Further, the Interim Federal Action Plan includes actions aimed at ensuring the effective and efficient use of federal resources, such as by leveraging nonfederal resources.

In late 2010, the agencies that signed the memorandum provided a status update on the Interim Federal Action Plan that confirmed the federal government's support of state efforts in the watershed.⁶⁹ The status update directs the federal government to review the components of any proposed restoration plan and understand the costs and benefits such a plan would have on federal water resources and taxpayers. The President's fiscal year 2019 budget, which sets the administration's top-level priorities and was released in February 2018, reaffirmed the federal government's commitment to the Interim Federal Action Plan and stated that the plan is under the leadership of CEQ, Interior, and the Delta

⁶⁷*Interim Federal Action Plan for the California Bay-Delta* (December 22, 2009).

⁶⁸Other priorities are to work with the state to produce the 50-year conservation plan (which California is no longer pursuing), encourage smart supply and use of Bay Delta water, and deliver drought relief services and ensure integrated flood risk management.

⁶⁹*Interim Federal Action Plan Status Update for the California Bay-Delta: 2011 and Beyond* (December 15, 2010).

Stewardship Council.⁷⁰ OMB staff stated the Interim Federal Action Plan provides overall guidance to federal agencies and clarifies that the agencies should focus their various actions in the watershed on the plan's four priorities, including while working with nonfederal entities through collaborative bodies.

Nonetheless, not all federal entities are using the Interim Federal Action Plan. Officials from the USDA Natural Resources Conservation Service told us they use the plan to determine conservation funding levels and priorities in the watershed. However, a former official who was responsible for CEQ's Bay Delta portfolio said that although the plan still matches the needs of the watershed, agencies had stopped following it in the past several years because the plan had become less of a priority for the administration. In addition, EPA and NOAA officials stated they were not aware of agencies following the plan in the past several years. According to the plan, its most important aspect is the federal government's reaffirmation of its partnership with state and local entities and its commitment to coordinate actions with them. Yet, of the 31 nonfederal entities responding to our survey questionnaire, 11 indicated that they were not at all familiar with the Interim Federal Action Plan, and another 9 indicated that they were slightly familiar with it.

Further, according to Interior officials, although restoration efforts described in the Interim Federal Action Plan have largely remained the same and its functions and activities are still relevant, the plan is outdated. In particular, according to these officials, the Interim Federal Action Plan refers to the state's 50-year conservation plan, which California is no longer pursuing. Moreover, according to Interior and EPA officials, the Federal Bay-Delta Leadership Committee—the coordinating body for the Interim Federal Action Plan—has not convened since the Delta Plan was developed in May 2013, even though the memorandum

⁷⁰Executive Office of the President, Office of Management and Budget, *Analytical Perspectives, Budget of the U.S. Government, California Bay-Delta Federal Budget Crosscut, Fiscal Year 2019* (Washington, DC: February 2018). As we reported in May 2011, the budget determines the fiscal policy stance of the government, and it is through the budget process that Congress and the President reach agreement about the areas in which the federal government will be involved and in what way. GAO, *Budget Process: Enforcing Fiscal Choices*, [GAO-11-626T](#) (Washington, DC: May 4, 2011). According to OMB staff, the Delta Stewardship Council's role as a co-leader is outdated, and OMB staff expect to update future budgets accordingly to reflect that CEQ and Interior are the co-leaders.

called for the committee to meet on a regular basis.⁷¹ Instead, according to Interior officials, the state-led Delta Plan Interagency Implementation Committee has replaced the federal leadership committee as the coordinating body for federal efforts in the watershed.

Interior and EPA officials we interviewed said the federal role outlined in the Interim Federal Action Plan is no longer relevant because of recent leadership and strategic changes in the watershed resulting from the state's withdrawal from the originally structured CALFED program and increased focus on the Delta through the Delta Stewardship Council. According to OMB staff and Interior and Delta Stewardship Council officials, the Delta Plan Interagency Implementation Committee is the current approach for coordinating among and between federal and state entities, and according to Interior officials, federal participation in the committee is key. The committee, however, focuses specifically on the Delta, and the Delta Plan generally does not include restoration efforts in the Bay and the upper watershed. Restoration requires a robust watershed-wide approach, according to the Interim Federal Action Plan, because the Bay, Delta, and upper watershed systems are interconnected. Specifically, according to one respondent to our survey, actions in the upper watershed affect water quality improvement and ecosystem restoration success in the Delta and ultimately the Bay. For example, according to California state officials, carefully timed water releases from dams in the upper watershed are the only way to control saltwater content in the Delta, which is critical for agriculture and urban water supply. Further, a National Research Council report states that Delta planning cannot be successful if it is not integrated into statewide planning because the Delta is fed by large upstream watersheds and water from the Delta is used outside the region, such as in the Bay.⁷² In addition, federal funding supports efforts throughout the watershed.

While the Interim Federal Action Plan is consistent with several of our leading practices for collaboration, it is not being used by all federal agencies. As we reported in 2012, key considerations for implementing interagency collaborative mechanisms include whether participating agencies have clarified roles and responsibilities, developed ways to

⁷¹The memorandum refers to the leadership committee as the Federal Bay-Delta Leadership Committee, and the Interim Federal Action Plan refers to it as the Bay-Delta Federal Leadership Committee. For the purposes of this report, we refer to the leadership committee as the Federal Bay-Delta Leadership Committee.

⁷²National Research Council (2012).

continually update and monitor written agreements on how agencies coordinate, and identified how leadership will be sustained over the long term.⁷³ We have found that agencies that articulate their agreements in formal documents, such as plans, can strengthen their commitment to working collaboratively and that transitions and inconsistent leadership can weaken coordination. A written document can incorporate agreements reached among participants in any or all of the following areas: leadership, accountability, roles and responsibilities, and resources. Although the Interim Federal Action Plan reflects several of these practices, it is not being used to lead overall federal efforts and has not been updated to reflect current roles and responsibilities in the watershed, in particular the transition of coordination from the plan's federal leadership committee to the Delta Plan Interagency Implementation Committee and the state's increased focus on the Delta. Further, the Delta Plan Interagency Implementation Committee is not an interagency coordination mechanism for the federal and state agencies to communicate complete information for the entire watershed.

Updating, including revising or refocusing, the Interim Federal Action Plan could help federal entities more fully coordinate with and support nonfederal restoration efforts across the watershed. EPA and Interior officials stated that coordination among the regions is challenging because agency missions and activities can be siloed. Officials from the Delta Stewardship Council told us that without coordinating with federal entities, they found it difficult to plan resources and work with federal entities. In addition, 31 of the 48 federal and nonfederal entities that responded to our survey questionnaire indicated that coordination of goals for the entire watershed was a very great or great challenge.⁷⁴ Moreover, according to our analysis of questionnaire responses, 29 of 48 federal and nonfederal entities indicated that coordination among partners at different levels of government was a very great or great challenge. For example, in narrative responses to our survey questionnaire, one

⁷³[GAO-12-1022](#). We also reported that written agreements are most effective when they are regularly updated and monitored. See also GAO, *Natural Resource Management: Opportunities Exist to Enhance Federal Participation in Collaborative Efforts to Reduce Conflicts and Improve Natural Resource Conditions*, [GAO-08-262](#) (Washington, DC: Feb. 12, 2008) and *Rural Economic Development: Collaboration between SBA and USDA Could Be Improved*, [GAO-08-1123](#) (Washington, DC: Sept. 18, 2008).

⁷⁴According to our analysis of survey responses, 41 of 48 federal and nonfederal entities indicated that coordination of goals for the entire watershed was at least a moderate challenge.

respondent stated that restoration projects can be delayed because many federal and nonfederal entities focus narrowly on their own missions without considering those of other stakeholders. By updating or revising the plan to outline and reflect entities' roles and responsibilities in light of the changes in the state's role and other relevant developments since 2009, and notifying all participating entities to ensure they are aware of the plan and their role in it, Interior and CEQ could help clarify the federal government's role in supporting restoration efforts in the watershed and help ensure the effective use of federal resources in these efforts.

Federal and Nonfederal Entities Have Developed Measurable Goals and Approaches to Assess Progress for Restoration Efforts in the Watershed

Federal and nonfederal entities have developed measurable goals for comprehensive restoration efforts in the Bay and Delta and for specific restoration efforts in the upper watershed. Federal and nonfederal entities have also developed approaches to assess progress for restoration efforts in the Bay and Delta and for some goals in the upper watershed. In the Bay and Delta, the San Francisco Estuary Partnership uses indicators to rate the goals as good, fair, or poor, and in 2015, the partnership rated the overall state of the Delta as in fair to poor condition and the Bay as healthier.

Federal and Nonfederal Entities Have Developed Measurable Goals for Comprehensive Restoration Efforts in the Bay and Delta and for Specific Efforts in the Upper Watershed

Federal and nonfederal entities have developed measurable goals for comprehensive restoration efforts in the Bay and Delta through the coordinating bodies for these areas and have developed measurable goals for specific restoration efforts in the upper watershed. The coordinating bodies have documented the goals in plans, which often contain action items aimed at achieving those goals. In addition, all three of the regions share some similar goals, such as ecosystem restoration, climate resilience, and water quality.

Measurable Goals for the Bay

Federal and nonfederal entities have developed measurable goals for comprehensive restoration efforts in the Bay through the San Francisco Estuary Partnership. The partnership documented these goals in the

CCMP, which provides a 35-year vision for restoring the estuary.⁷⁵ The most recent CCMP, updated in 2016, contains four long-term goals related to broad restoration efforts: ecosystem restoration, climate resilience, water quality and quantity, and governance.⁷⁶ Each goal contains three objectives, which detail desired outcomes that make progress toward achieving goals. To achieve the goals and objectives, the plan also identifies 32 actions—each of which can be associated with multiple goals and objectives—that lay out 112 priority tasks for the next 5 years. Figure 6 shows an example of a priority task and how it relates to the actions, objectives, and goals. The 2016 CCMP also includes measurements to track progress for all actions and links the plan’s goals, objectives, and actions to 33 environmental indicators established by the partnership.⁷⁷

Figure 6: Example of a Priority Task in the 2016 CCMP for the San Francisco Bay Delta Estuary



Source: GAO analysis of the 2016 Comprehensive Conservation and Management Plan for the San Francisco Estuary. | GAO 18-473

Measurable Goals for the Delta

Federal and nonfederal entities have developed measurable goals for comprehensive restoration efforts in the Delta through the Delta Stewardship Council and documented them in the Delta Plan, first published in 2013. The Delta Plan contains six goals and establishes funding principles to support implementation of the Delta Plan as a

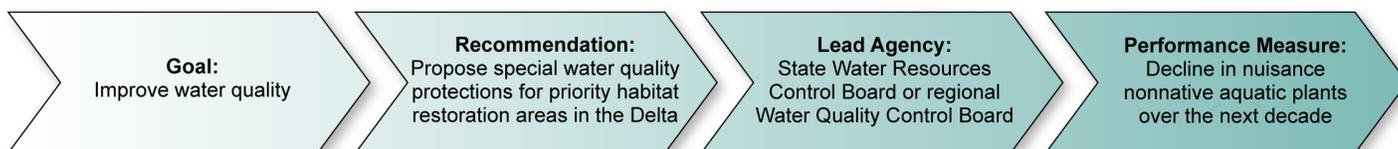
⁷⁵The San Francisco Estuary Partnership first produced the CCMP in 1993 and updated it in 2007 and 2016. The 1993 and 2007 CCMPs focused on goals for the Bay, including the Suisun Marsh; the 2016 CCMP included more comprehensive goals for the Delta, in addition to the Bay. In response to a 1993 CCMP recommendation, a separate plan was created that added goals for wetlands along the periphery of the Bay; See the 1999 *Baylands Ecosystem Habitat Goals* and its 2015 *Science Update*.

⁷⁶Specifically, the four goals in the 2016 CCMP are (1) sustain and improve the estuary’s habitats and living resources; (2) bolster the resilience of estuary ecosystems, shorelines, and communities to climate change; (3) improve water quality and increase the quantity of fresh water available to the estuary; and (4) champion the estuary—this goal includes an objective to promote efficient and coordinated regional governance.

⁷⁷San Francisco Estuary Partnership, *State of the Estuary* (Oakland, CA: 2015).

whole.⁷⁸ Four of the goals—protecting, restoring, and enhancing the Delta ecosystem; reducing climate-related risks; improving water quality; and governance—are similar to those of the CCMP.⁷⁹ To accomplish all six goals and meet the funding principles, the Delta Plan sets forth 87 provisions for various entities, such as local, state, and federal agencies. Fourteen of these provisions are legally enforceable regulatory policies.⁸⁰ The Delta Plan also has 159 performance measures associated with these goals and provisions. For example, under improving water quality, the Delta Plan includes a provision related to priority habitat restoration areas. (See fig. 7.)

Figure 7: Example of a Water Quality Recommendation in the Delta Plan



Source: GAO analysis of the 2013 Delta Plan. | GAO 18-473

Measurable Goals for the Upper Watershed

Federal and nonfederal entities developed measurable goals for specific efforts in the upper watershed and documented these goals in plans specific to entities, projects, or restoration topics.⁸¹ These plans include goals similar to those outlined in the CCMP or the Delta Plan—such as ecosystem restoration, climate resilience, and improved water quality—and some of the goals have associated performance measures. For example, several federal and nonfederal entities documented in the Central Valley Joint Venture Implementation Plan the acreage they would like to enhance annually for conserving migratory bird habitat—a specific

⁷⁸According to the Delta Plan, the funding principles outline guiding principles for developing stable financing for Delta Plan implementation and describe near-term funding requirements for certain critical activities.

⁷⁹The remaining two goals are protecting the Delta as an evolving place and increasing water supply reliability, which focuses on state-wide issues related to fresh water conveyance to agricultural areas, with an emphasis on the Delta.

⁸⁰According to the Delta Plan, the 87 provisions are the working parts of the plan and consist of 14 regulatory policies and 73 nonregulatory recommendations. The Delta Plan refers to the policies as legal requirements and to the recommendations as tasks being, or to be, done.

⁸¹In the Bay and the Delta, federal and nonfederal entities have also developed entity- or topic- specific plans with measurable goals.

ecosystem restoration effort. Another group, California's Central Valley Flood Protection Board, documented in the state's Central Valley Flood Protection Plan that it would like to increase infrastructure performance in populous areas to result in a more resilient flood management system—an example of a specific resiliency goal. This goal contains tracking metrics, including measuring the miles of levees repaired or improved. In addition, Interior produces metrics and reports for activities under the Central Valley Project Improvement Act.⁸²

Federal and Nonfederal Entities Have Developed Approaches to Assess and Report Progress toward Some Measurable Goals in the Bay, Delta, and Upper Watershed

Federal and nonfederal entities have developed indicators to assess and report progress toward some of the measurable goals in the Bay, and have applied these in the Delta as well. In the Bay, the San Francisco Bay Regional Water Quality Control Board has implemented regional monitoring pilot studies since 1989, and in 1992 it established a regional monitoring program led by a nonprofit science center. In 1991, in addition to water quality, the science center began reporting on the monitoring and assessment of ecosystem restoration and resilience in the estuary, such as changes over time in pollution, dredging, and numbers of endangered and threatened fish and wildlife. The San Francisco Estuary Partnership then used the science center's restoration and resilience assessments to create the 1993 CCMP goals. At the same time, partly in response to a recommendation from the CCMP, the science center became the San Francisco Estuary Institute, a nonprofit scientific organization that performs monitoring to inform watershed management. The San Francisco Estuary Partnership began reporting on water quality progress in 2011. The first of these reports, titled the *State of San Francisco Bay*, focused on the Bay.⁸³

In the Delta, the Delta Stewardship Council in 2013 began working to coordinate scientific monitoring efforts based on the goals outlined in the Delta Plan.⁸⁴ Scientific monitoring efforts in the Delta include a regional water quality monitoring program, begun by the Central Valley Regional

⁸²Interior's reports can be accessed at https://www.usbr.gov/mp/cvpia/docs_reports/.

⁸³San Francisco Estuary Partnership, *State of San Francisco Bay* (Oakland, CA: 2011).

⁸⁴The Delta Plan's science activities are led by the Delta Science Program under the Delta Stewardship Council. The Delta Plan recommends that the Delta Science Program develop a comprehensive science plan for the Delta that creates an overarching road map for organizing and integrating ongoing scientific research, monitoring, analysis, and data management among entities.

Water Quality Control Board in 2015. The monitoring efforts also include the Interagency Ecological Program, a consortium of state and federal agencies that have collaborated to monitor and research ecological conditions in the Delta since the 1970s, including by contributing to the CALFED science program. Based on the results of these separate monitoring efforts, the Delta Stewardship Council has a process in place to periodically update the Delta Plan's performance measures and goals.

In 2015, the San Francisco Estuary Partnership updated its assessment and report to include both the Bay and the Delta and renamed it *State of the Estuary*.⁸⁵ The partnership plans to update these reports approximately every 5 years and include both the Bay and the Delta.⁸⁶ For the 2015 report, more than 100 scientists from entities such as the San Francisco Estuary Institute, the U.S. Geological Survey, and the Delta Stewardship Council collaborated to monitor and assess estuary health against environmental indicators established by the partnership. The report includes 17 indicators specifically for the Bay, 8 indicators specifically for the Delta, and 4 estuary-wide indicators (see table 1). The report rates the status of the indicators—such as the safety of water for swimming, the safety of fish to eat, and the level of harbor seal populations—as good, fair, or poor.⁸⁷ For example, the *State of the Estuary* report assessed the regional extent of tidal marsh in the Bay as “fair” and “improving” and the Yolo Floodplain Flows in the Delta as “poor;” however, the report did not detail the partnership’s methodology

⁸⁵San Francisco Estuary Partnership, *State of the Estuary* (Oakland, CA: 2015). Contributors to this assessment include scientists from various entities, including federal and state agencies; the Metropolitan Water District of Southern California; the University of California, Davis; and nonprofit organizations such as the San Francisco Estuary Institute.

⁸⁶The partnership also coordinates a State of the San Francisco Estuary Conference every 2 years for scientists and other representatives from entities working in the Bay and Delta. During the conference, participants provide updates on the status of projects, share scientific research, and present monitoring results.

⁸⁷According to the *State of the Estuary* technical appendix, the definitions of the status categories of good, fair, and poor were determined using data unique to each indicator.

for delineating between “fair” and “poor” assessments.⁸⁸ On the basis of its assessment, the partnership rated the Delta and Suisun Bay ecosystems as being in fair to poor condition and the Bay as healthier.

Table 1: Indicators Assessed by the San Francisco Estuary Partnership, by Region of the San Francisco Bay Delta Estuary

Category	Indicator	San Francisco Bay and its local watershed	Sacramento-San Joaquin Delta	Estuary-wide
Water	Safe for swimming	X		
	Safe for aquatic life			X
	Fish safe to eat			X
	Freshwater inflows			X
Habitat	Open Water Habitat	X	X	
	Eelgrass	X		
	Tidal Marsh	X	X	
Wildlife	Benthic invertebrates (e.g., Asian clams)		X	
	Fish	X	X	
	Harbor seals	X		
	Winter waterfowl	X		
	Breeding waterfowl		X	
	Shorebirds	X		
	Hérons and egrets	X		
	Tidal marsh birds	X		
Ridgway’s rail	X			
Processes	Migration space			X
	Beneficial floods	X	X	
	Zooplankton as food		X	

⁸⁸The regional extent of tidal marsh in the Bay at the time of the report was more than 50 percent of the long-term goal proposed by the 1999 *Baylands Ecosystem Habitat Goals* report (100,000 acres). The report noted that restoration projects added another 6,000 acres of tidal marsh from about 2009 through 2015 and that 24,000 more acres are expected to be added over the next 20 to 30 years. The indicator for the Yolo Floodplain Flows in the Delta combines three benchmarks that assess the frequency, magnitude, and duration of flood flows from the Yolo Bypass into the San Francisco Bay Delta Estuary. “Good” conditions occur when flows meet or exceed each of these benchmarks. For the 75-year period assessed, which ended in 2014, data presented in the report indicate that the frequency, magnitude, and duration of inundation of the Yolo Bypass usually have been insufficient to support ecological processes such as floodplain spawning, rearing, and migration of native fishes.

Category	Indicator	San Francisco Bay and its local watershed	Sacramento-San Joaquin Delta	Estuary-wide
	Fish as food		X	
	Cormorant chicks raised	X		
	Heron and egret chicks raised	X		
People	Urban water use	X		
	Recycled water use	X		
	Trail access	X		
Total		17	8	4

Source: San Francisco Estuary Partnership, *State of the Estuary* (Oakland, CA: 2015) | GAO 18-473

In the upper watershed, progress assessment is tied to entity- and topic-specific plans and is not summarized by any one group or in one report. For example, California’s Central Valley Flood Protection Board assigns agencies to keep track of data toward tracking metrics for the goals of the Central Valley Flood Protection Plan. In another example, the state’s California EcoRestore initiative provides progress reports on restoration projects to mitigate damage caused by water conveyance programs.

The Status of All Restoration Efforts across the Watershed and Total Expenditures Is Unknown

Information on the status of all restoration efforts across the watershed, including their accomplishments, is unknown because, while the information is being developed, complete and current information is not being fully collected or reported. Total expenditures for fiscal years 2007 through 2016 are unknown, in part because federal reports do not include complete or reliable data for federal and state expenditures in the watershed.

Information on the Status of All Restoration Efforts across the Watershed Is Being Developed but Is Not Complete and Current

Information on the status of all restoration efforts across the watershed, including their accomplishments, is unknown because complete and current information is not being fully collected or reported. At the state level, the San Francisco Estuary Institute and the Delta Stewardship Council each maintains a database with information about federal and nonfederal restoration efforts, including those implemented during fiscal

years 2007 through 2016, but neither database contains data on all restoration efforts in the watershed.⁸⁹ Specifically:

- **EcoAtlas.** The San Francisco Estuary Institute, in cooperation with the San Francisco Bay Joint Venture, maintains the EcoAtlas database, which is the more comprehensive of the two databases.⁹⁰ EcoAtlas integrates stream and wetland maps, restoration information, and monitoring results with land use, transportation, and other information important to the state's wetlands.⁹¹ According to institute officials, the database was originally designed to focus on the Bay and includes information on nearly every restoration effort in the Bay. According to these officials, the institute is working to update EcoAtlas and gather information on all efforts across the watershed. Officials from several federal and nonfederal entities—including NOAA, the institute, the San Francisco Bay Joint Venture, and the Central Valley Joint Venture—told us that the completeness of EcoAtlas's data on restoration efforts in the Delta is catching up to that for the Bay, but a lot of work remains to gather more complete data in the upper watershed, such as by gathering more complete project information from entities conducting restoration work there.
- **DeltaView.** The Delta Stewardship Council's DeltaView database collects state and federal data on efforts directly related to implementing the state's Delta Plan goals. As a result, DeltaView does not include information for all restoration efforts in the Delta since, for example, local government agencies and other nonfederal

⁸⁹Several entities maintain databases with information about their own restoration efforts, which are generally implemented through partnerships with other federal or nonfederal entities. For example, NOAA's Restoration Center maintains a project tracking database that identifies where NOAA conducts habitat restoration work nationwide, including in the San Francisco Bay Delta watershed. The database tracks project descriptions and related information—including locations, partners, and funding matches—and can be accessed using NOAA's Restoration Atlas at <https://restoration.atlas.noaa.gov/src/html/index.html>.

⁹⁰The San Francisco Bay Joint Venture—a partnership with the mission to conserve migratory bird habitat—maintains a comprehensive database of habitat restoration projects in the Bay and has integrated its database into EcoAtlas.

⁹¹EcoAtlas includes three categories of information as called for in California Wetland Monitoring Workgroup's Tenets of a State Wetland and Riparian Monitoring Program: (1) maps and spatial information, (2) general wetland condition information, and (3) specific condition information. EcoAtlas can be accessed at <https://www.ecoatlas.org/>.

entities may also conduct restoration efforts in the Delta.⁹² According to its website, DeltaView is designed to track and report on Delta Plan progress and help the Delta Plan Interagency Implementation Committee make more informed decisions about implementing the Delta Plan. According to council officials, because it is designed to focus on the Delta, DeltaView does not include efforts in the Bay or upper watershed unless they directly affect the Delta. Further, while officials who manage EcoAtlas and DeltaView take steps to check the completeness of the data, such as using regional administrators to oversee project completeness for EcoAtlas or following up with agency officials annually for DeltaView, they stated it is difficult to confirm their completeness because they largely rely on self-reporting by different federal and nonfederal entities. Council officials stated that while the information in EcoAtlas is generally more comprehensive, DeltaView's information on restoration efforts in the Delta is more complete than EcoAtlas's information about the Delta, and they are working with the institute on ways to merge the two databases to make more complete information available in a single database.

On the federal level, section 105 of the CALFED Act requires Interior, in cooperation with the Governor of California, to submit a report annually to Congress that, among other things, describes the status of implementation of all CALFED components, such as water quality and ecosystem restoration across the watershed.⁹³ Under the act, the report is to include the progress made in meeting certain goals as well as accomplishments in achieving certain CALFED objectives during the past fiscal year. However, according to Interior officials, the department issued the most recent of these reports in February 2009. Interior officials stated that the California Bay-Delta Authority used to collect information on all

⁹²DeltaView was built from the former CALFED Project Performance Information System, which was CALFED's automated data management system. According to Delta Stewardship Council officials, the CALFED system provided information about CALFED's broader scope of projects, which included restoration efforts throughout the watershed. Council officials stated that DeltaView has been updated to link to the goals and objectives of the Delta Plan and to narrow its scope to focus on projects in or affecting the Delta only. DeltaView can be accessed at <http://deltacouncil.ca.gov/delta-view>.

⁹³Calfed Bay-Delta Authorization Act, Pub. L. No. 108-361, § 105, 118 Stat. 1681, 1698 (2004). The report is also to include a description of expenditures in the past fiscal year for implementing the CALFED program. Section 106 of the act requires OMB to submit a financial report annually to Congress, in coordination with the Governor of California and certified by the Secretary of the Interior, that, among other things, is to identify all expenditures since 1998 by the federal and state governments to achieve CALFED objectives.

the projects in the watershed and prepare and submit these reports. However, since the California Bay-Delta Authority was abolished and replaced by the Delta Stewardship Council, Interior does not obtain this information from any state entity, although Interior is still required to submit the report annually to Congress.

Because Interior has not issued a report since 2009, when the California Bay-Delta Authority was abolished, and because other sources of information on restoration efforts such as EcoAtlas are not yet fully developed, no complete or current information on the progress of restoration efforts is available. According to Interior officials, the requirement to report is outdated and the department does not have information to report because it stopped obtaining data from the California Bay-Delta Authority after it was abolished. However, Interior and other federal agencies continue to work with state agencies on the state's current Delta Plan, which replaced the state's CALFED plans. Also, according to Interior officials, the department has not reached out to the state to identify new sources of information, given the change in state plans or agency structure.

Section 105 of the CALFED Act requires Interior, in consultation with California's governor, to report annually on "the status of implementation of *all* components of the Calfed Bay-Delta Program."⁹⁴ The law goes on to identify the specific objectives on which Interior is to report,⁹⁵ which include activities that Interior and other federal agencies are currently carrying out, such as research and wetland restoration. According to respondents to our survey questionnaire, having such information could help stakeholders make more informed decisions about these efforts. Specifically, according to our analysis of responses, 32 of 48 federal and nonfederal entities indicated that it would be very or extremely important to have reports on progress of federal and nonfederal entities in implementing restoration activities.⁹⁶ In addition, according to our analysis of responses, 27 of 48 federal and nonfederal entities indicated that it would be very or extremely important to have reports on

⁹⁴Pub. L. No. 108 361, § 105(a)(1)(A), 118 Stat. 1698 (emphasis added).

⁹⁵Pub. L. No. 108 361, § 105(a)(2)(D), 118 Stat. 1698-99. These objectives include, among other things: (1) water storage; (2) water quality; (3) water use efficiency; (4) ecosystem restoration; (5) watershed management; and (6) levee system integrity.

⁹⁶Forty-two of these 48 entities indicated that it would be at least moderately important to have reports on progress.

accomplishments of federal and nonfederal entities in achieving the objectives of restoration activities.⁹⁷ Without attempting to obtain and report state information as required under section 105 of the CALFED Act, Interior will not have reasonable assurance that it is providing Congress, or others, with the information needed to monitor federal and nonfederal restoration activities.

Total Expenditures for All Restoration Efforts in the Watershed Are Unknown in Part Because Federal Reporting is Incomplete

Total expenditures for all restoration efforts in the watershed for fiscal years 2007 through 2016 are unknown in part because federal reports do not include complete or reliable expenditure data, and other tracking mechanisms are still developing this information. San Francisco Estuary Institute officials stated that EcoAtlas recently began to include expenditure data for the on-the-ground costs of implementing restoration projects, but overall expenditure data on these projects are still incomplete. In addition, as discussed earlier, EcoAtlas is still in the process of gathering complete information for efforts in the Delta and upper watershed. DeltaView includes federal and state expenditure data for efforts in the Delta; however, according to Delta Stewardship Council officials, it does not include data for all restoration efforts in the Delta, such as those funded by nongovernmental organizations. The institute's plans to expand EcoAtlas to include expenditures and data on efforts across the watershed, including by working with the council to merge the two databases, indicates that entities are taking steps to gather more complete information. As they continue to do so, more information will be available to report on expenditures for restoration efforts in the watershed.

One source of information on federal and state expenditures across the watershed is OMB's interagency budget crosscut reports for CALFED activities; however, these reports do not contain complete or accurate expenditure data. Section 106 of the CALFED Act requires OMB to submit a financial report annually to Congress, in coordination with the Governor of California and certified by the Secretary of the Interior, that includes, among other things, an interagency budget crosscut report.⁹⁸ The report is to display each participating federal agency's proposed budget for the upcoming fiscal year to carry out CALFED activities and

⁹⁷Forty-two of these 48 entities indicated that it would be at least moderately important to have reports on accomplishments.

⁹⁸Pub. L. No. 108-361, § 106(c), 118 Stat. 1681, 1700 (2004).

identify all expenditures since 1998 by the federal and state governments to achieve the objectives of CALFED, which, as noted previously, include water quality and ecosystem restoration components. The report is also to contain a detailed accounting of all funds received and obligated by all federal and state agencies responsible for implementing CALFED activities during the past fiscal year.

According to OMB staff, since California abolished the California Bay-Delta Authority in 2009, the state no longer submits state data for the crosscut report, so the agency only includes data reported by federal agencies in the crosscut reports and tables.⁹⁹ OMB staff said this is because the state no longer has an agency organized around reporting this information. The Delta Stewardship Council has responsibility for the former state agency's activities, but given its narrower focus on the Delta, it is unclear whether the council could submit data to OMB for the entire watershed. According to OMB staff, OMB has not asked the Delta Stewardship Council or any other state entities to submit the data they do have to OMB; however, a council official told us the council would like an opportunity to work on the crosscut report.

Survey responses indicate that the state crosscut data could be helpful to federal and nonfederal entities. We asked survey respondents to indicate how important, if at all, they thought reports on all federal or state expenditures and funding committed to be spent (i.e., obligations) on restoration activities would be when they carry out activities related to these responsibilities in the San Francisco Bay Delta watershed. According to our analysis of survey responses, 24 of 48 federal and nonfederal entities indicated that it would be very or extremely important to have reports on both federal and state expenditures.¹⁰⁰ Also, according to our analysis of survey responses, 27 of 48 federal and nonfederal

⁹⁹Recent crosscut reports have been organized to report information, beginning with fiscal year 2012, under the four priorities of the federal Interim Federal Action Plan: renewed federal-state partnership, smarter water supply and use, habitat restoration, and drought and floodplain management. The most recent crosscut report, which OMB issued in February 2018, indicates that the "enacted" dollars for all agencies for the habitat restoration priority ranged from about \$242 million in fiscal year 2012 to about \$195 million in fiscal year 2018. This report can be accessed at <https://www.whitehouse.gov/wp-content/uploads/2018/02/bay-delta-fy2019.pdf>. The related crosscut tables can be accessed at <https://www.whitehouse.gov/wp-content/uploads/2018/02/bay-delta-fy2019.xlsx>.

¹⁰⁰Thirty-nine of these 48 entities indicated that it would be at least moderately important to have reports on both federal and state expenditures.

entities indicated that it would be very or extremely important to have reports on federal obligations, and 24 of the 48 entities indicated that it would be very or extremely important to have reports on state obligations.¹⁰¹ Without attempting to obtain and report state information as required under section 106 of the CALFED Act, OMB will not have reasonable assurance that it is providing Congress with the information it needs to monitor federal and nonfederal restoration expenditures.

In addition, while there was written guidance for submitting crosscut data for fiscal years 1998 through 2011, OMB has not updated its written guidance on reporting data for the CALFED Act since the guidance expired in 2011 to reflect who should report what data. Instead, according to OMB staff, it has generally provided oral instruction to agencies on what data to submit. As a result, we found that federal agencies reported different types of data for OMB to include in the budget crosscut and that the budget crosscut was therefore not reliable for the purposes of reviewing total expenditures. Some federal agencies, including EPA and the U.S. Geological Survey, note in their crosscut submissions that the data provided are funding levels or allocations, rather than expenditures. In addition, Interior reported that it submits obligations,¹⁰² which are also different than expenditures.¹⁰³ As a result, the crosscut reports and tables may include a mix of federal budget authority, obligations, and expenditures, depending on the type of data the agencies choose to submit.¹⁰⁴

¹⁰¹Thirty-eight of these 48 entities indicated that it would be at least moderately important to have reports on both federal and state obligations.

¹⁰²An obligation is a definite commitment that creates a legal liability of the government for payment of goods and services ordered or received, or a legal duty on the part of the United States that could mature into a legal liability by virtue of actions on the part of the other party beyond the control of the United States. Payment of an obligation may be made immediately or in the future. See GAO, *A Glossary of Terms Used in the Federal Budget Process*, [GAO-05-734SP](#) (Washington, DC: Sept. 1, 2005).

¹⁰³An expenditure is the actual spending of money; an outlay. An outlay is the issuance of checks, disbursement of cash, or electronic transfer of funds made to liquidate a federal obligation. Outlays during a fiscal year may be for payment of obligations incurred in prior years (prior-year obligations) or in the same year. Outlays, therefore, flow in part from unexpended balances of prior-year budgetary resources and in part from budgetary resources provided for the year in which the money is spent. See [GAO-05-734SP](#).

¹⁰⁴Budget authority is authority provided by federal law to enter into financial obligations that will result in immediate or future outlays involving federal government funds. See [GAO-05-734SP](#).

According to OMB staff, while OMB reports federal budget authority data for the most recent fiscal year in the crosscut report, OMB relies on agencies to submit data on prior year expenditures for inclusion in the crosscut. However, the crosscut report itself labels the data reported as “enacted” dollars—or budget authority—but does not mention expenditures. Some federal officials said that clearer guidance would be helpful. For example, USDA officials stated that it would be helpful for OMB to clarify whether to submit estimated funding allocations or actual obligations and to provide more specific information about the types of restoration projects to include because the data USDA currently submits provide a narrow scope for the agency’s restoration-related work in the watershed.

The lack of updated guidance is inconsistent with federal standards for internal control, which call for an agency to design control activities to achieve objectives and manage risks.¹⁰⁵ Such control activities include clearly documenting internal controls, and the documentation may appear in management directives, administrative policies, or operating manuals. Because OMB has not updated its written guidance on reporting data since the guidance expired in 2011 to clearly communicate what data agencies should report, its mechanism for tracking data—the crosscut reports and tables—does not include complete or reliable expenditure data. As a result, congressional and other federal and nonfederal decision makers may not have the information they need to determine that resources are being used efficiently or effectively. For example, in a September 2017 report, Interior’s Office of Inspector General found that Reclamation obtained \$50 million over 7 years for CALFED-related purposes using a process that it did not disclose to Congress through available mechanisms, including OMB’s crosscut reports.¹⁰⁶ According to the Inspector General’s report, these crosscuts assist the President in considering the necessary and appropriate level of funding for each of the agencies in carrying out its responsibilities under CALFED. By directing its staff to update its written guidance for federal and state agencies on submitting data for its budget crosscut reports, OMB will have more reasonable assurance that it is helping those agencies provide current,

¹⁰⁵[GAO-14-704G](#).

¹⁰⁶Department of the Interior, Office of Inspector General, *The Bureau of Reclamation Was Not Transparent in Its Financial Participation in the Bay Delta Conservation Plan*, Report No. 2016-WR-040 (Washington, DC: Sept. 7, 2017).

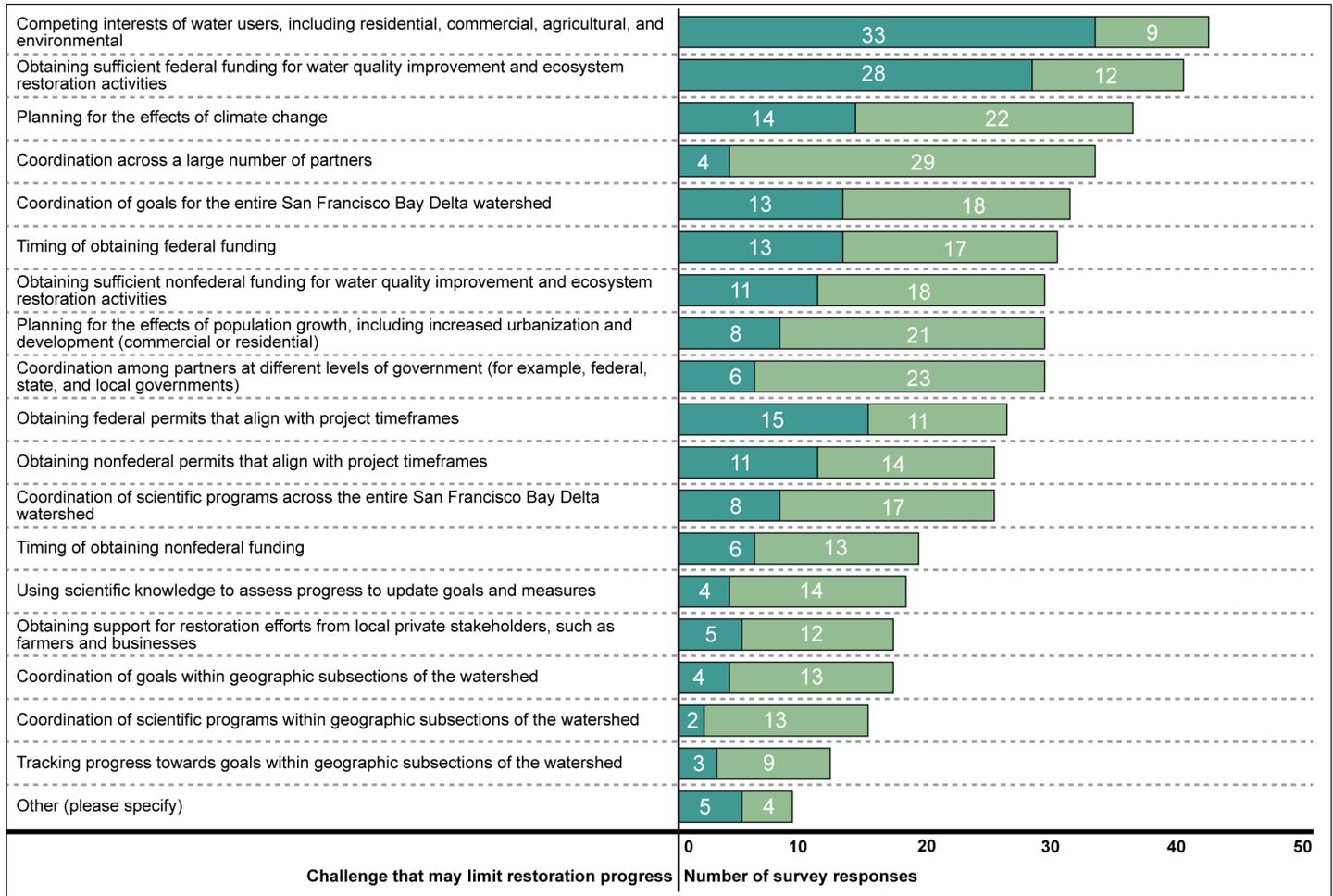
complete, and accurate data to help congressional and other decision makers achieve restoration objectives.

Federal and Nonfederal Entities Identified Several Factors, such as Competing Interests, Coordination, and Climate Change, As Key Factors that May Limit Restoration

Several factors may limit restoration progress or pose risks to the long-term overall success of such efforts in the San Francisco Bay Delta watershed, according to our analysis of questionnaire responses from 48 federal and nonfederal entities. These factors reflect characteristics of watersheds in other parts of the country that we have previously discussed, including funding constraints and the effects of climate change (see fig. 8).¹⁰⁷

¹⁰⁷To obtain perspectives from federal and nonfederal entities about challenges that may limit restoration progress in the watershed, we asked survey respondents to indicate how much of a challenge, if at all, they thought 18 different factors pose to the water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed. We identified these 18 possible challenges based on our review of relevant restoration progress reports and interviews with federal, state, and other entities that conduct restoration work in the watershed.

Figure 8: Factors Viewed as Posing a ‘Great’ or ‘Very Great’ Challenge to Water Quality Improvement and Ecosystem Restoration Efforts in the San Francisco Bay Delta Watershed, According to Survey Responses from 48 Federal and Nonfederal Entities



Very great challenge
Great challenge

Source: GAO analysis of survey results. | GAO-18-473

Note: To obtain perspectives from federal and nonfederal entities about challenges that may limit restoration progress in the watershed, we asked survey respondents to indicate how much of a challenge, if at all, they thought 18 different factors pose to the water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed. We identified these 18 possible challenges based on our review of relevant restoration progress reports and interviews with federal, state, and other entities that conduct restoration work in the watershed.

Federal and nonfederal entities also identified up to three factors that pose the greatest risks to the long-term overall success of water quality improvement and ecosystem restoration efforts in the San Francisco Bay

Delta watershed.¹⁰⁸ Specifically, based on our analysis of the survey results, we found that federal and nonfederal entities consistently identified the following risks:

- **Competing interests of water users, including residential, commercial, agricultural, and environmental.** According to our analysis of survey responses, this particular risk varies by geographic area in the watershed. For example, 20 of 25 entities that indicated they conduct restoration work in the Sacramento River Watershed—part of the upper watershed region—identified this factor as a greatest risk.¹⁰⁹ By comparison, 19 of 34 entities that indicated they conduct restoration work in the Bay identified this factor as a greatest risk. In its survey responses, one nonfederal entity indicated that the distribution of water and other natural resources among competing interests is not clearly defined or not distributed in a method that satisfies all parties. Therefore, according to this entity, stakeholders who are not satisfied with natural resources distribution may be hesitant to invest time and money in conservation practices that benefit water quality. In another survey response, a federal entity described competing interests as one of the biggest roadblocks in planning and implementing water quality improvement and ecosystem restoration in the Bay Delta region. This entity explained that there is an extremely limited freshwater supply in the region and interests that compete for it have resulted in several lawsuits and delays for restoration projects.
- **Obtaining sufficient federal funding for water quality improvement and ecosystem restoration activities.** Of the 48 survey respondents, 24 indicated that this factor is one of the greatest risks to long-term overall success of water quality improvement and ecosystem restoration efforts. According to one nonfederal entity's survey response, funding for ecosystem restoration in the Bay area traditionally has come from a mix of federal and state sources. For

¹⁰⁸To obtain perspectives from federal and nonfederal entities about long-term risks, we asked survey respondents about factors that pose the greatest risks to the long-term overall success of water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed.

¹⁰⁹Our survey asked respondents to identify the geographic subsection(s) of the San Francisco Bay Delta watershed in which their entity conducts water quality improvement and ecosystem restoration activities. We asked respondents to identify more than one subsection, if applicable. As a result, when combined, the number of entities that indicated they conduct work in each subsection of the watershed is greater than the total number of survey respondents.

example, the entity said a local source that will provide nearly \$500 million over 20 years recently was established but needs to be leveraged by significant state and federal dollars to meet the estimated \$1.5 billion needed for restoration in the Bay area. In its response to our survey, one federal entity stated that federal funding is extremely limited for restoration activities that are not part of mitigation efforts. The federal entity also stated that federal funding for long-term monitoring of restoration success and water quality improvement is difficult to sustain because these efforts are not eye-catching and do not provide quick results. A nonfederal entity stated that many state entities rely on federal grants to perform activities that result in improved water quality and ecosystem restoration.

- **Planning for the effects of climate change.** In their survey responses, 24 of 48 entities indicated that this factor is one of the greatest risks to long-term overall success of water quality improvement and ecosystem restoration efforts. One nonfederal entity said expected reductions in the Sierra Nevada snow pack—the largest source of water supply for the watershed—will result in increased demand on limited local water sources. Other respondents noted a need to consider addressing the effects of climate change at a high level. For instance, one nonfederal entity said successfully planning for climate change includes planning and coordinating at the watershed level, not at the project or jurisdictional level. Another nonfederal entity said the potential impact of sea level rise is great and ecosystem restoration solutions will require much more regional planning and agreement than more traditional engineering solutions. However, entities also acknowledged the challenges associated with planning for the effects of climate change with incomplete information. For example, in its response to our questionnaire, one entity stated it is difficult to understand the impact on water quality resulting from conservation practices on working lands, at both the private landowner level and the watershed level, if the projects have not incorporated climate change impacts such as flooding and sediment erosion.

The factors identified by federal and nonfederal entities that may limit or pose a risk to restoration efforts are generally consistent with our prior work on large-scale ecosystem restoration efforts in other parts of the country (see Related GAO Products at the end of this report). For example, we previously reported that similar factors, such as funding constraints and the effects of climate change, may limit restoration efforts

in the Great Lakes and Chesapeake Bay.¹¹⁰ Survey responses also indicate that some of these risks can be interrelated. For example, one federal entity said that while certain shoreline restoration and levee stabilization projects could ameliorate the effects of climate change, finding adequate funding to plan for and implement such projects is extremely difficult. According to this entity, all the competing interests and limited freshwater supply in the watershed further exacerbates these difficulties.

In response to our questionnaire, federal and nonfederal entities identified what they consider to be the most important action that could be taken at a federal level to help improve restoration efforts in the watershed. For example, seven entities mentioned actions related to streamlining or coordinating federal permitting processes.¹¹¹ Half of the entities that responded to our questionnaire also indicated a need for actions related to federal funding, and four entities indicated a need to use the best available science to direct restoration efforts.

Conclusions

The complex nature of the restoration efforts in the San Francisco Bay Delta watershed demands a high level of coordination across a large number of entities and competing interests. The results of federal and nonfederal entities working together can be seen in parts of the watershed, such as the Bay, where this work has resulted in the development of comprehensive regional strategies, sources of funding for some restoration projects, an expanding regional database, and an inventory of potential projects.

¹¹⁰GAO, *Great Lakes Restoration Initiative: Further Actions Would Result in More Useful Assessments and Help Address Factors that Limit Progress*, [GAO-13-797](#) (Washington, DC: Sept. 27, 2013) and *Chesapeake Bay: Restoration Effort Needs Common Federal and State Goals and Assessment Approach*, [GAO-11-802](#) (Washington, DC: Sept. 15, 2011).

¹¹¹Recent reports identified similar issues related to streamlining or coordinating permitting processes. See Bay Planning Coalition, Sustainable Waterfronts Committee, *Shoreline Restoration/Resiliency Projects in SF Bay: An Opportunity for Improving Regulatory Efficiency* (Oakland, CA: Nov. 21, 2017); Delta Plan Interagency Implementation Committee, Delta Stewardship Council, *Agency Review of EcoRestore Project Tracking Matrix—Final Report* (Sacramento, CA: April 2017); Mark Lubell, *The Governance Gap: Climate Adaptation and Sea-Level Rise in the San Francisco Bay Area*, University of California, Davis (Davis, CA: June 27, 2017); and Flood Control 2.0, *Flood Protection Projects and the Regulatory Process* (Richmond, CA: November 2016).

In other parts of the watershed, particularly the Delta, coordination has wavered. The CALFED Act was enacted in 2004 to implement, at the federal level, a federal-state partnership for restoring the San Francisco Bay Delta watershed. When the state of California withdrew from the originally structured CALFED federal-state partnership in 2009, the effort to coordinate across the entire watershed transitioned and the focus of coordination became the Delta Plan, a state-led effort. Key federal entities, including Interior and CEQ, continue to have interests across the watershed, such as coordinating or conducting programs and projects and expending resources. To that end, in 2009 they developed a unifying vision for the federal government through the Interim Federal Action Plan. However, as the state continues to change its focus within the watershed, the Interim Federal Action Plan has become outdated, and not all relevant federal entities are using it. By updating or revising the plan to outline and reflect entities' roles and responsibilities in light of the changes in the state's role and other relevant developments since 2009, and by notifying all participating entities to ensure they are aware of the plan and their role in it, Interior and CEQ could help clarify the federal government's role in supporting restoration efforts in the watershed and help ensure the effective use of federal resources in these efforts.

In addition, since California stopped participating in the originally structured CALFED partnership, information on projects and expenditures for restoration and other activities in the watershed have not been completely reported, or reported at all. Although California abolished the California Bay-Delta Authority, the requirements for Interior to report on the status of implementation of all CALFED components, including water quality and ecosystem restoration efforts, and for OMB to submit a financial report, including an interagency budget crosscut report, still exist, and information about related restoration efforts and expenditures remains unknown. By coordinating with the appropriate state entities to obtain and report the information available to meet the CALFED Act's requirements, Interior and OMB would have more reasonable assurance that they are providing the information congressional and other decision makers need to monitor the restoration efforts and associated expenditures. Further, by directing staff to update OMB's written guidance for federal and state agencies on submitting data for its budget crosscut reports, OMB would have more reasonable assurance that it is helping those agencies provide current, complete, and accurate data to help decision makers achieve restoration objectives.

Recommendations for Executive Action

We are making seven recommendations—two each to Interior and CEQ to address issues with the Interim Federal Action Plan; one each to Interior and OMB to obtain and report information; and one to OMB to update its budget crosscut guidance. Specifically:

The Secretary of the Interior should work with the Chair of CEQ to update or revise the Interim Federal Action Plan for the California Bay-Delta to outline and reflect entity roles and responsibilities in light of changes in the state of California's role and other relevant developments since 2009. (Recommendation 1)

The Secretary of the Interior should notify all participating entities to ensure they are aware of the Interim Federal Action Plan and their role in it. (Recommendation 2)

The Chair of CEQ should work with the Secretary of the Interior to update or revise the Interim Federal Action Plan for the California Bay-Delta to outline and reflect entity roles and responsibilities in light of changes in the state of California's role and other relevant developments since 2009. (Recommendation 3)

The Chair of CEQ should notify all participating entities to ensure they are aware of the Interim Federal Action Plan and their role in it. (Recommendation 4)

The Secretary of the Interior should coordinate with appropriate state entities to obtain and report the information available to meet the requirements under section 105 of the CALFED Act. (Recommendation 5)

The Director of OMB should coordinate with appropriate state entities to obtain and report the information available to meet the requirements under section 106 of the CALFED Act. (Recommendation 6)

The Director of OMB should direct staff to update OMB's written guidance for federal and state agencies on submitting data for the budget crosscut reports OMB is required to submit under section 106 of the CALFED Act. (Recommendation 7)

Agency Comments, Third-Party Views, and Our Evaluation

We provided a draft of this report for review and comment to CEQ, EPA, OMB, and the Departments of Agriculture, Commerce, Defense, and the Interior. We also provided the California Delta Stewardship Council a draft of this report for review and comment. Interior provided written comments and stated that it partially concurred with our three recommendations to the department; Interior also provided technical comments, which we incorporated into the report as appropriate. In an email from CEQ's Deputy General Counsel, CEQ provided technical comments, which we incorporated into the report as appropriate, but the agency neither agreed nor disagreed with our recommendations to it. In oral comments provided on August 8, 2018, OMB neither agreed nor disagreed with our two recommendations to the agency, but OMB staff suggested some additional language to the recommendations. In addition, USDA and Commerce provided technical comments, which we incorporated into the report as appropriate. Defense and EPA informed us that they had no comments on the draft report. The California Delta Stewardship Council provided written comments stating that its staff generally agreed with the "sum" of the recommendations in the report. The council also provided technical comments, which we incorporated into the report as appropriate.

In its written comments, reproduced in appendix IV, Interior stated that the department appreciated our review of the coordination of watershed restoration efforts among federal and nonfederal entities and that it partially concurred with our three recommendations to the department. Specifically, regarding our first two recommendations to update or revise the Interim Federal Action Plan and notify all participating entities of their role in the plan, Interior stated that the department believes revisiting the Interim Federal Action Plan is not the most efficient course of action because the state-led Delta Plan Interagency Implementation Committee now serves as the coordination group. Interior stated that it will continue to actively participate in the committee, which includes participation and leadership from federal agencies at the regional and Washington office levels. However, as we discuss in the report, the committee focuses on only one region of the watershed (the Delta), and federal agencies fund and carry out restoration efforts across all three regions of the watershed. Further, as we discuss in the report, the President's fiscal year 2019 budget states that federal activities are coordinated through the Interim Federal Action Plan rather than the state-led committee. Also, Interior's letter states that its bureaus are concurrently engaged with the state of California in multiple activities in the Bay Delta that span their respective mission areas. This provides further support for the plan to be updated or revised to include these types of activities. Thus, we continue to believe

that Interior should update or revise the plan to better reflect changes in the state's role and other relevant developments since 2009.

Regarding our third recommendation to Interior that it coordinate with the state to meet reporting requirements, Interior stated that the California Delta Stewardship Council compiles and reports on funding information and progress for federal and state agencies and that Interior could coordinate with the state on information not reported by the council. As we discuss in the report, the council's reporting efforts focus on only the Delta, although federal funding and efforts span the entire watershed; therefore, the council's reporting efforts cannot fully address Interior's reporting requirements. In addition, Interior has not reached out to state entities for this information since 2009, when the state agency from which Interior had previously obtained state data was abolished. Thus, we continue to believe that Interior should coordinate with the appropriate state entities to obtain and report the information available to meet the CALFED Act's reporting requirements. We note that Interior said it would actively participate in the Delta Plan Interagency Implementation Committee and could seek to coordinate with the state on information not reported by the Delta Stewardship Council, and we are encouraged that the department recognizes the need to take these actions.

In oral comments regarding our first recommendation to OMB that it coordinate with the state to meet reporting requirements, OMB staff said it is unclear whether the Director of OMB has the authority to require or compel the state or its agencies to provide data to OMB on restoration and other projects they are carrying out. The staff suggested that we revise the recommendation to state that the Director of OMB should "consider whether there are additional opportunities to" coordinate with appropriate state entities to obtain and report the available information. Our recommendation is for OMB to coordinate with appropriate state entities, not to require or compel them to do so. In addition, as stated in its written comments (reproduced in appendix V), the California Delta Stewardship Council—the state agency responsible for the activities of the abolished California Bay-Delta Authority—would welcome the opportunity to coordinate with OMB and contribute to the budget crosscut reports. Furthermore, Section 106 of the CALFED Act requires OMB to submit a financial report annually to Congress, in coordination with the Governor of California, that includes an interagency budget crosscut report. Thus, we believe that the recommendation is worded appropriately and captures the actions that OMB should take to coordinate with the appropriate state entities to obtain and report the information available to meet the CALFED Act's reporting requirements.

In oral comments regarding our second recommendation to OMB that it update its written guidance for federal and state agencies on submitting data for the budget crosscut reports, OMB staff said that the agency does not have the expertise to validate or verify the quality of the information agencies submit and is not confident that the data collected will be reliable. The staff said that other entities with day-to-day experience with the programs and data and with the relevant statutory authority may be in a better position to obtain, report, and verify the quality of restoration data. The staff suggested that we revise the recommendation to state that the Director of OMB should “assess whether to” update OMB’s written guidance for federal and state agencies on submitting data for the budget crosscut reports. However, OMB’s current approach is resulting in the reporting of unreliable data. As reported above, OMB has generally provided oral instruction to agencies since its written guidance expired in 2011; as a result, the crosscut reports and tables may include a mix of federal budget authority, obligations, and expenditures. Further, Section 106 of the CALFED Act requires, among other things, that OMB identify all expenditures since 1998 by the federal and state governments to achieve CALFED objectives. Therefore, we continue to believe that OMB should update its written guidance to clarify the type of data that agencies should submit in order to ensure it is reporting the data required by the CALFED Act. We note that our recommendation does not direct OMB staff to validate or verify the quality of the information; instead, it states that OMB should clarify in guidance what data agencies should provide. In addition, if OMB determines it is appropriate, updated written guidance could advise agencies to validate and verify the data before submitting it to OMB.

In its written comments, reproduced in appendix V, the California Delta Stewardship Council made four comments on the themes outlined in the recommendations of our report and two specific comments on the report’s description of the Delta. Commenting on the themes outlined in the recommendations, the council stated that:

- No entity in California has the sole responsibility or authority for managing water supply and the Delta ecosystem; instead, authority, expertise, and resources are spread out among a cadre of federal, state, and local agencies. The council further said that its Delta Plan Interagency Implementation Committee plays a vital coordination role for the 17 state and federal agencies operating in the Delta, that federal participation is critical to the committee’s success, and that it encourages federal agencies to continue to attend and actively participate in the committee.

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- There is a history of coordination in the Bay Delta systems, as evidenced by events such as the State of the Estuary Conference and the Bay Delta Science Conference, as well as the CCMP. Given that the upper watershed currently lacks a collaborative structure such as the implementation committee, the council said that further exploration should be done as to how this gap could be filled.
 - The council is not currently in contact with CEQ and OMB and would welcome the opportunity to coordinate with them should a revised Interim Federal Action Plan be pursued. The council also stated that, to the extent possible, such a revised plan should consider and build on existing planning frameworks such as the Delta Plan and the CCMP.
 - As stated in the report, the council welcomes the opportunity to contribute to the CALFED budget crosscut reports.

In addition, the council made two specific comments on the report's description of the Delta. First, it stated that our report is thorough in discussing many aspects of the watershed, but it somewhat neglects the importance of levees, particularly in the Delta. While we provide an overview of levees in the background section, a more detailed discussion of these and other water infrastructure facilities is beyond the scope of this review, which is to examine restoration efforts in the watershed and does not include detailed examination of issues related to water supply. Second, the council stated that the report should mention and consider characteristics associated with the Delta as an evolving place, which refers to the council's efforts to consider the interaction between environmental and social factors—such as cultural values and socio-economic issues—into decision making for the Delta. We believe our discussion of federal and nonfederal coordination roles within and across the watershed's three major regions, including the Delta, appropriately considers the interaction between environmental and social factors, within the scope of this review.

We are sending copies of this report to the appropriate congressional committees, the Chair of CEQ; the Secretaries of Agriculture, Commerce, Defense, and the Interior; the Administrator of EPA; the Director of OMB; the Executive Officer of the California Delta Stewardship Council; and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or gomezj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VI.

A handwritten signature in black ink that reads "Alfredo Gómez". The signature is written in a cursive style with a large, stylized 'G'.

J. Alfredo Gómez
Director, Natural Resources and Environment

Appendix I: Selected Federal and Nonfederal Entities with Restoration-Related Roles in the San Francisco Bay Delta Watershed

Many federal and nonfederal entities, including state and local government agencies and nongovernmental organizations, have roles related to water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed. Different combinations of federal and nonfederal entities work throughout the watershed and its three major geographic areas, which are the San Francisco Bay and its local watershed (Bay), the Sacramento-San Joaquin Delta (Delta), and the upper watershed, which includes California's Central Valley and the western slope of the Sierra Nevada Mountains. See below for a list of federal and nonfederal entities and a brief description of some of their restoration-related roles in the watershed. We selected these entities based on our review of documents provided by, and interviews with, federal and nonfederal entities.

Selected Federal Entities with Restoration-Related Roles in the Watershed

Several federal entities have roles related to water quality improvement and ecosystem restoration efforts in the watershed. All federal agencies listed are signatories to the 2009 memorandum of understanding, unless otherwise noted.¹ Federal agencies and some of their restoration-related roles include the following:

- **Executive Office of the President.**
 - *Council on Environmental Quality (CEQ).* Under the 2009 memorandum of understanding, CEQ is to work with the Secretary of the Interior in coordinating the development and implementation of federal policy and initiatives in Bay-Delta matters and is the co-chair of the Federal Bay-Delta Leadership Committee.
 - *Office of Management and Budget (OMB).* OMB is not a signatory to the 2009 memorandum of understanding, but under the CalFed

¹On September 29, 2009, six federal agencies (the Departments of Agriculture, the Army, Commerce, and the Interior; Environmental Protection Agency; and the Council on Environmental Quality) signed a memorandum of understanding that established a Federal Bay-Delta Leadership Committee to coordinate the federal response to the California water crisis and to facilitate a partnership with the State of California in addressing California's water supply and environmental challenges. The memorandum also committed the federal agencies to develop, in an expedited fashion, a coordinated federal work plan; the Federal Bay-Delta Leadership Committee developed the Interim Federal Action Plan on December 22, 2009. By its terms, the memorandum expired after 5 years. The most recent President's budget, released in February 2018, reaffirmed the federal government's commitment to the Interim Federal Action Plan and stated that the plan is under the leadership of the Department of the Interior, the Council on Environmental Quality, and the Delta Stewardship Council.

Bay-Delta Authorization Act (CALFED Act), OMB is required to annually submit a financial report to Congress, in coordination with the Governor of California and certified by the Secretary of the Interior, that includes, among other things, an interagency budget crosscut report that identifies all expenditures since 1998 by the federal and state governments to achieve the objectives of the Calfed Bay-Delta Program (CALFED).² CALFED program components include, among other things, water quality and ecosystem restoration.

- **U.S. Army Corps of Engineers.** According to Corps officials, the Corps plans and implements projects, including ecosystem restoration projects; participates in regional planning, while using its own return-on-investment analysis for prioritizing projects; and helps the state water agencies maintain levees. The Corps also issues permits for the discharge of dredged or fill material under section 404 of the Clean Water Act.
- **U.S. Department of Agriculture (USDA).**
 - *Natural Resources Conservation Service (NRCS).* Through general conservation programs and also its targeted Bay Delta Initiative, NRCS and its local partners aim to address the critical water quantity, water quality, and habitat restoration needs of the Bay Delta region by implementing voluntary conservation practices on private lands. NRCS provides agricultural producers technical and financial assistance in the Bay Delta region to implement conservation practices and establish conservation easements that improve water quality and quantity and restore and protect wetland, riparian, and wet meadow habitat.
 - *U.S. Forest Service.* The Pacific Southwest Region of the U.S. Forest Service manages 20 million acres of National Forest land in California. National forests supply 50 percent of the water in California and form the watershed of most major aqueducts and more than 2,400 reservoirs throughout the state. According to U.S. Forest Service officials, the agency’s management actions on National Forest land in California are focused on ecological restoration, with the goal of retaining and restoring the ecological resilience, including water quality, of terrestrial and aquatic ecosystems. According to these officials, this work is often accomplished using an “all lands” approach to restoration, by

²Calfed Bay-Delta Authorization Act, Pub. L. No. 108-361, § 106(c), 118 Stat. 1681, 1700 (2004).

coordinating and collaborating across forests and wildlands regardless of ownership. Ecological restoration management actions that contribute to water quality include meadow, river, and riparian restoration to improve watershed function, as well as fuels reduction activities, such as forest thinning and prescribed fire. According to these officials, many forest lands have dense fuels and are highly susceptible to severe wildfire, which causes increased erosion rates and sedimentation and negatively affects water quality and delivery.

- **U.S. Department of Commerce.**

- *National Oceanic and Atmospheric Administration (NOAA)*. NOAA implements the Endangered Species Act for certain species. Under section 7 of the act, federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of its critical habitat. To fulfill this responsibility, federal agencies must consult with NOAA's National Marine Fisheries Service, depending on the affected species, to assess the potential effects of proposed actions. Formal consultations between federal agencies and the National Marine Fisheries Service or U.S. Fish and Wildlife Service are required where a proposed action could have an adverse effect on listed species or designated critical habitat; these consultations conclude with issuance of biological opinions by the National Marine Fisheries Service or U.S. Fish and Wildlife Service.³ NOAA also obtains, manages, and expends funding to conduct habitat restoration. According to NOAA officials, NOAA's Restoration Center has directed federal funds toward restoration projects in the Bay Delta. In addition, funds from natural resource damage assessments have been used for habitat restoration in San Francisco Bay, according to NOAA officials.⁴

³The biological opinion is to discuss in detail the effects of the proposed action on listed species and their critical habitat and contain the National Marine Fisheries Service's or U.S. Fish and Wildlife Service's opinion on whether the proposed action is likely to jeopardize the continued existence of the species or destroy or adversely modify any designated critical habitat.

⁴According to NOAA officials, NOAA has used its authority to assess and obtain legal settlements from polluters for natural resource damages under the Oil Pollution Act of 1990 and other federal environmental laws. See Oil Pollution Act of 1990, Pub. L. No. 101-380, 104 Stat. 484 (1990). NOAA is a designated trustee for natural resource damages, along with other federal and state agencies.

- **U.S. Department of the Interior.** Under the 2009 memorandum of understanding, Interior is to serve as the lead for developing and coordinating federal policy and initiatives in Bay-Delta matters and is the co-chair of the Federal Bay-Delta Leadership Committee. Under the CALFED Act, Interior is required to annually submit a report to Congress, in cooperation with the Governor of California, that, among other things, describes the status of implementation of all CALFED components, which include water quality and ecosystem restoration components.⁵
- *Bureau of Reclamation.* Reclamation administers the Central Valley Project, which has long-term contracts to supply water to more than 250 contractors in 29 of California's 58 counties, and implements a number of actions under the Central Valley Project Improvement Act. The act was enacted for several purposes, including to protect, restore, and enhance fish, wildlife, and associated habitats. Reclamation also implements other actions, such as those under the San Joaquin River Restoration Settlement Act.
- *U.S. Fish and Wildlife Service.* The U.S. Fish and Wildlife Service implements the Endangered Species Act for certain species. According to agency officials, the U.S. Fish and Wildlife Service is also a major landowner, with several National Wildlife Refuges throughout the watershed where restoration efforts are implemented. Additionally, according to agency officials, the U.S. Fish and Wildlife Service provides funding through grant programs, such as the North American Wetlands Conservation, National Coastal Wetlands Conservation, and Wildlife and Sportfish Restoration programs, and provides technical assistance through efforts, such as the Partner for Fish and Wildlife, Coastal, and Tribal Wildlife programs.
- *U.S. Geological Survey.* According to U.S. Geological Survey officials, the agency's role in the watershed includes conducting physical, chemical, and biological monitoring and scientific investigations to support water and water quality management, fish and wildlife management, and infrastructure management and protection. According to officials, the agency also provides policy-neutral technical support to Interior and other federal, state, and local entities.

⁵Pub. L. No. 108-361, § 105(a), 118 Stat. at 1698.

- **U.S. Environmental Protection Agency (EPA).** EPA implements the Clean Water Act, including management of the National Estuary Program. According to agency officials, EPA also provides authorization, financial support, and oversight of the California State Water Resources Control Board, the partner state agency charged with implementing Clean Water Act programs in California, and provides direct funding, technical assistance, and oversight of programs and projects achieving Clean Water Act goals in the state.

Selected State
Government Entities with
Restoration-Related Roles
in the Watershed

Several state government entities in California have roles related to water quality improvement and ecosystem restoration efforts in the watershed. A list of selected state agencies and information from the agencies summarizing their restoration-related roles follows:

- **California Delta Stewardship Council.** The Delta Stewardship Council is a planning and science agency, with some regulatory authority. The council develops and reviews the Delta Plan, the implementation of which is to further the restoration of the Delta ecosystem and a reliable water supply. The council also funds research, synthesizes and communicates scientific information to decision makers, and coordinates with Delta agencies to promote science-based adaptive management. In addition, the council establishes and oversees the Delta Plan Interagency Implementation Committee, a joint state-federal committee that implements the Delta Plan.
- **California Natural Resources Agency.** The Natural Resources Agency is a resource management agency, with some regulatory authority.
 - *Central Valley Flood Protection Board.* The Central Valley Flood Protection Board establishes and enforces standards for the maintenance and operation of the flood control system; develops and implements the state's flood protection plan for the Central Valley; and coordinates activities among the Corps and local flood control agencies.
 - *Department of Fish and Wildlife.* The Department of Fish and Wildlife plans, collaborates on, enforces, and funds species management, habitat conservation, and wetlands restoration. According to agency officials, the department also is a major owner of land where restoration efforts take place, such as the Napa-Sonoma Marsh Wildlife Area and Eden Landing Ecological Reserve, and houses the California Wildlife Conservation Board, which provides funding for restoration projects.

- *Department of Water Resources.* The Department of Water Resources administers the California State Water Project, including sales to water contractors. The department also implements and funds—through the State Water Project—two fish habitat restoration projects in response to NOAA and U.S. Fish and Wildlife Service biological opinions. In addition, the department develops the California Water Plan, the state’s overall water resources plan.
- *Sacramento-San Joaquin Delta Conservancy.* The Sacramento-San Joaquin Delta Conservancy plans, collaborates on (with local communities), implements, and funds projects in the Delta and Suisun Marsh to protect, improve, and restore habitats and ecosystems, improve water quality, and support water-related agricultural sustainability, among other things.
- *San Francisco Bay Conservation and Development Commission.* The San Francisco Bay Conservation and Development Commission plans, collaborates on, and regulates the San Francisco Bay, Bay shoreline, and Suisun Marsh; it also permits projects that fill or extract materials from the Bay.
- *Sierra Nevada Conservancy.* The Sierra Nevada Conservancy plans, collaborates on, implements, and funds projects in parts of the upper watershed to protect, improve, and restore habitats and ecosystems, improve water quality, and prepare for climate change, among other things.
- *State Coastal Conservancy.* The State Coastal Conservancy plans, collaborates on, implements, and funds—partly through voter-approved bonds—projects around the Bay to protect and improve natural lands, improve water quality and wildlife habitats, and prepare for climate change, among other things.
- **California Environmental Protection Agency.** The California Environmental Protection Agency is a regulatory agency.
 - *State Water Resources Control Board.* The State Water Resources Control Board allocates water rights, adjudicates water rights disputes, develops statewide protection plans, establishes water quality standards, and guides the nine regional water quality control boards.
 - *San Francisco Bay Regional Water Quality Control Board.* One of nine regional water quality control boards in California, the San Francisco Bay Regional Water Quality Control Board exercises rulemaking and regulatory activities for the Bay.

- *Central Valley Regional Water Quality Control Board.* One of nine regional water quality control boards in California, the Central Valley Regional Water Quality Control Board exercises rulemaking and regulatory activities for the Central Valley (including the Delta) of the upper watershed.

Other Selected Nonfederal
Entities with Restoration-
Related Roles in the
Watershed

Other nonfederal entities—including local and regional government agencies, nongovernmental organizations, private businesses, and private landowners—have roles related to water quality improvement and ecosystem restoration efforts in the watershed. Other nonfederal entities and some of their restoration-related roles include the following:

- **Central Valley Joint Venture.** The Central Valley Joint Venture is a cooperative, regional partnership—partially supported through the U.S. Fish and Wildlife Service and established under the North American Waterfowl Management Plan—that plans and coordinates migratory bird and other habitat restoration and conservation in the Central Valley.
- **San Francisco Estuary Institute.** The San Francisco Estuary Institute is a nonprofit science center that provides data and other technical tools for assessing the health of the waters, wetlands, wildlife, and landscapes of the Bay and Delta; manages the EcoAtlas database of restoration projects; and works closely with the California State Water Resources Control Board and the San Francisco Estuary Partnership.
- **San Francisco Estuary Partnership.** The San Francisco Estuary Partnership is a cooperative, regional partnership that develops and manages the comprehensive conservation and management plan for the San Francisco Estuary (i.e., the Bay Delta) under EPA’s National Estuary Program, including coordinating projects and leveraging funds. The partnership is staffed by the nine-county Association of Bay Area Governments and housed by the San Francisco Bay Regional Water Quality Control Board.
- **San Francisco Bay Joint Venture.** The San Francisco Bay Joint Venture is a cooperative, regional partnership—organized through the U.S. Fish and Wildlife Service and established under the North American Waterfowl Management Plan—that plans and coordinates migratory bird and other habitat restoration and conservation in the Bay.
- **Other regional government agencies.** Other regional government agencies have a variety of restoration-related roles, depending on the

entity. In addition to the San Francisco Estuary Partnership, examples of regional government agencies with restoration roles in the watershed include the Bay Area Clean Water Agencies, Bay Area Flood Protection Agencies Association, and California Association of Resource Conservation Districts.

- **Nongovernmental organizations.** Other nongovernmental organizations have restoration-related roles in the watershed, including the Audubon Society, Bay Planning Coalition, Ducks Unlimited, Nature Conservancy, and Save the Bay.
- **Local governments.** Local governments have a variety of restoration-related roles, depending on the entity. For example, according to U.S. Fish and Wildlife officials, Marin and San Mateo Counties are recognized leaders in planning for climate resiliency in wetland restoration. Also, Alameda County uses sediment excavated from flood control district channels to build or create wetlands to provide vital wildlife habitat. In addition, water treatment facilities work with the California State Water Resources Control Board to help fund the San Francisco Estuary Institute's water quality monitoring program.
- **Dredging businesses.** Dredging businesses work with the California State Water Resources Control Board to help fund the San Francisco Estuary Institute's water quality monitoring program.
- **Water contractors.** Through obligations under the Central Valley Project and State Water Project, water contractors help fund certain restoration projects required under biological opinions by various regulatory agencies, including NOAA, the U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife, according to state officials.
- **Private landowners.** Some private landowners collaborate on or sell land for various restoration and conservation projects. Private landowners include businesses (e.g., technology companies and an industrial salt pond owner) and farmers in the Bay and farmers and ranchers throughout the Delta and upper watershed.

Appendix II: Objectives, Scope, and Methodology

In this report, we examine (1) the extent to which federal and nonfederal entities coordinate their San Francisco Bay Delta watershed restoration efforts, (2) the extent to which federal and nonfederal entities have developed measurable goals and approaches to assess progress for San Francisco Bay Delta watershed restoration efforts, (3) information on the status of San Francisco Bay Delta watershed restoration efforts and related expenditures for fiscal years 2007 through 2016, and (4) key factors that may limit San Francisco Bay Delta watershed restoration, according to federal and nonfederal entities.

To address all four objectives, we reviewed relevant federal and state laws and documents. We also interviewed officials from more than 28 federal, state, and other entities we identified through our review of laws and documents, snowball sampling, and their participation in regional interagency groups conducting restoration work in the San Francisco Bay Delta watershed. During these interviews, we asked about, among other things, restoration plans that coordinate multiple aspects of water quality improvement and ecosystem restoration efforts on a regional level in the San Francisco Bay Delta watershed. Officials and representatives we interviewed identified the Comprehensive Conservation and Management Plan (CCMP) and the Delta Plan as the overarching regional strategies for the Bay and Delta, respectively. We considered these strategies “comprehensive regional plans” and reviewed them to address our objectives.

To address our objectives, we obtained information from a questionnaire we sent to all 61 federal, state, and other entities that serve on the boards or implementation committees of regional interagency groups conducting restoration work in our geographic scope. These groups were the San Francisco Bay Joint Venture, San Francisco Estuary Partnership, Delta Plan Interagency Implementation Committee, and Central Valley Joint Venture. The survey group includes many of the entities listed above in appendix I. We also sent this questionnaire to federal agencies that are signatories of the CALFED record of decision and 4 other relevant organizations identified through snowball sampling. We initially identified and distributed our questionnaire to 78 entities. We sent a single questionnaire to each nonfederal entity (e.g., state agency, nongovernmental organization, local government agency, etc.) and sent more than one questionnaire, as appropriate, to federal agencies that have offices or officials working in different parts of the watershed. We determined which federal level to survey based on a review of agency organizational charts and inquiries with agency officials. We considered each office or federal designee to be a separate federal entity due to the

distinct nature of their work based on geographic region. To ensure we got survey responses that reflect the opinions of an entity, we included instructions for survey points of contact to collaborate with colleagues, as needed, and indicated that we only wanted one survey response from each entity. After we began our survey effort, we identified 6 entities as out of scope for a variety of reasons, such as being a subgroup of another entity we surveyed. Our final population of surveyed entities was 72, of which 48 responded to our questionnaire, a response rate of 67 percent.

In our questionnaire, we collected information on water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed, including, among other things, (1) challenges that may limit restoration progress;¹ (2) risks to the long-term overall success of water quality improvement and ecosystem restoration efforts; and (3) types of reports that entities could consider important when carrying out responsibilities related to water quality improvement and ecosystem restoration. To ensure that our survey questions were appropriate and that respondents could answer them in a reliable and meaningful way, we conducted survey pre-tests with 5 entities from the study population, had the questionnaire reviewed by an independent reviewer within GAO, and revised the questionnaire as appropriate based on the results of these efforts. The survey questionnaire used for this review is in appendix III. Our survey field period ran from December 4, 2017, through January 29, 2018. We distributed the questionnaire electronically through email. After the requested return date passed, we emailed or telephoned respondents who had not returned the questionnaire and asked them to respond.

By January 29, 2018, we received 48 questionnaires. In order to minimize potential nonresponse bias, we reviewed the key characteristics of respondents to ensure we received completed questionnaires from each of our population subgroups. Because this was not a sample questionnaire, it has no sampling errors. However, the practical difficulties of conducting any survey may introduce nonsampling errors, such as difficulties in interpreting a particular question or sources of information available to respondents, which can introduce unwanted variability into the survey results. We took steps in developing the questionnaire, collecting the data, and analyzing them to minimize such nonsampling error. Survey questionnaires may also be subject to error in entering and

¹We identified 18 possible challenges based on our review of relevant restoration progress reports and interviews with federal, state, and other entities that conduct restoration work in the watershed.

analyzing data. We implemented quality control procedures on our data entry by verifying the accuracy of the process. We noted any missing, irregular, or incorrect responses by the respondent and resolved these responses, as needed, through email correspondence with the relevant entities.

To examine the extent to which federal and nonfederal entities coordinate their San Francisco Bay Delta watershed restoration efforts, we interviewed officials from federal, state, and other entities to identify key regional plans and coordination efforts. We reviewed these plans and efforts and compared federal coordination efforts against a selection of our leading practices for collaboration to assess the extent to which federal entities followed these practices.² The selected leading practices for collaboration include whether participating agencies have clarified roles and responsibilities, developed ways to continually update and monitor written agreements on how agencies coordinate, and identified how leadership will be sustained over the long-term. Our questionnaire discussed above also surveyed entities to identify coordination-related challenges, if any.

To understand what restoration projects were being carried out, we obtained information from the San Francisco Estuary Institute's EcoAtlas database and the Delta Stewardship Council's DeltaView database on restoration projects. We also conducted site visits to a nonprobability sample of four projects selected to provide illustrative examples of a variety of restoration activities in different locations in the watershed. We identified these sites by asking knowledgeable stakeholders about restoration projects in each region of the watershed that involved a variety of partners, including federal agencies, that were at various stages of completion. We then arranged visits that would allow us to observe projects in each region that illustrated a range of these selection criteria. We also conducted site visits to water project facilities, including a reservoir, dam, and pumping station. In addition, we attended the State of the San Francisco Estuary Conference in Oakland, California, on October 10 and 11, 2017, and observed many presentations and panel discussions on topics ranging from Delta restoration planning to pesticides in the estuary, by a wide range of officials from federal and nonfederal entities conducting restoration efforts across the watershed.

²GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, DC: Sept. 27, 2012). For the purposes of this report, we use the terms collaboration and coordination interchangeably.

To examine the extent to which federal and nonfederal entities have developed measurable goals and approaches to assess progress for San Francisco Bay Delta watershed restoration efforts, we reviewed comprehensive regional plans and related goals and progress reports, including the technical appendix for the *State of the Estuary* report.³ To do so, we looked for factors such as goals with quantifiable metrics and targets, as well as indicators used to assess and report progress. We also interviewed officials from federal, state, and other entities, including scientific groups, about efforts to develop measurable goals and assess restoration progress.

To examine information on the status of San Francisco Bay Delta watershed restoration efforts and related expenditures for fiscal years 2007 through 2016, we obtained and analyzed available data—collected from the EcoAtlas and DeltaView databases—that included information about projects, expenditures, and cost estimates for this period.⁴ This period covers the time before and after the state withdrew from the CALFED federal-state partnership, as originally structured, and includes the last full fiscal year for which the most recent data were available at the time of our review. We assessed the reliability of these data by interviewing knowledgeable officials and reviewing database documentation and determined that they were not reliable for purposes of identifying all restoration projects across the entire watershed and for reporting related expenditure data. We also reviewed federal and state reports on budget requests and authority for that period and interviewed officials from federal, state, and other entities about available sources of data on projects, expenditures, and cost estimates.

We also obtained and reviewed OMB's Bay Delta budget crosscuts, which include financial information for San Francisco Bay Delta watershed restoration efforts reported by federal and state agencies, for fiscal years 2007 through 2019. We assessed the reliability of the data in the federal budget crosscut reports and tables by interviewing federal agency officials about what data they provided for the reports and tables and analyzing the data provided in the crosscut reports. We determined that the data were reliable only to report examples of the magnitude of funding for individual agencies. We determined that these data were not

³San Francisco Estuary Partnership, *State of the Estuary* (Oakland, CA: 2015).

⁴EcoAtlas can be accessed at <https://www.ecoatlas.org/>; DeltaView can be accessed at <http://deltacouncil.ca.gov/delta-view>.

reliable to aggregate funding levels across programs and agencies or to compare funding levels of the various agencies, as we discuss in this report. We then compared OMB's written guidance on submitting data for the crosscut reports with federal standards for internal control to assess the extent to which federal agencies followed the standard for design of control activities.⁵

To determine key factors that may limit San Francisco Bay Delta watershed restoration, according to federal and nonfederal entities, we sent the survey questionnaire described above to federal, state, and other entities to obtain views on (1) challenges that may limit restoration progress and (2) risks to the long-term overall success of water quality improvement and ecosystem restoration efforts. We also interviewed officials from federal, state, and other entities about factors that may limit restoration progress, as well as reviewed progress reports and studies exploring these factors.

We conducted this performance audit from April 2017 to August 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

⁵GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, DC: Sept. 10, 2014).

Appendix III: Summary Results of GAO Survey Questionnaire of Federal and Nonfederal Entities

We distributed this survey questionnaire to 72 federal and nonfederal entities that work in the San Francisco Bay Delta watershed. In this survey, we collected information on water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed, including, among other things, (1) challenges that may limit restoration progress;¹ (2) risks to the long-term overall success of water quality improvement and ecosystem restoration efforts; and (3) types of reports that entities could consider important when carrying out responsibilities related to water quality improvement and ecosystem restoration. The following copy of this survey questionnaire includes summary information for the responses provided by federal and nonfederal entities. It does not include information for narrative responses.

¹We identified 18 possible challenges based on our review of relevant restoration progress reports and interviews with federal, state, and other entities that conduct restoration work in the watershed.

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



Introduction

The [U.S. Government Accountability Office \(GAO\)](#) is an independent, nonpartisan agency that advises Congress and executive agencies about ways to help improve the performance and ensure the accountability of the federal government. GAO is currently reviewing efforts to conduct water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed. This work is expected to result in a 2018 report to Congress that will also be available to the public on GAO's website.

To conduct this work, GAO has developed this survey to obtain information on efforts to conduct water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed. As a part of this study, we are surveying entities that serve on the boards or implementation committees of the San Francisco Bay Joint Venture, San Francisco Estuary Partnership, Delta Plan Interagency Implementation Committee, and Central Valley Joint Venture. We are also surveying federal agencies that are signatories of the CALFED record of decision and a small number of other relevant organizations.

Please feel free to coordinate with other staff from your entity, as needed, to respond to our full set of questions. The opinions you provide in this survey will be critical to providing Congress with complete and balanced information on efforts to conduct water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed. Including information from your entity in our analysis will help ensure that the full range of federal and nonfederal experiences and views are accurately captured in this report. It is not GAO's practice to name individuals in our reports, though information may be attributed generally (such as by type of organization) or presented in the aggregate. Though GAO endeavors to maintain confidentiality of the information obtained through this survey, GAO is not authorized to withhold information from the Congress or from a court if compelled by law.

Thank you in advance for your cooperation and assistance.

Instructions

This survey can be completed using Adobe Acrobat and returned as an e-mail attachment to SFBayDeltaReview@gao.gov. To do this, first save this Adobe .pdf file containing the survey to your computer. You may then enter your responses directly into that file. In the event you would like to share any supporting documentation with us, please feel free to include additional relevant materials as attachments in your e-mail submission. We request that you submit your responses to this survey by **Wednesday, December 20th**.

IMPORTANT: You will need to have JavaScript turned on to complete the survey. Before starting the survey, please verify that JavaScript is turned on in Adobe by going to Edit > Preferences > JavaScript and confirming that the Enable Acrobat JavaScript box is checked.

After completing the survey we recommend that you save and print a copy to have a backup of the survey you completed. This backup will help ensure that any potential software errors do not result in lost information.

If you have any questions about completing this survey please e-mail SFBayDeltaReview@gao.gov or call Michelle Wong at 202-512-3413 or Edith Yuh at 202-512-3476.

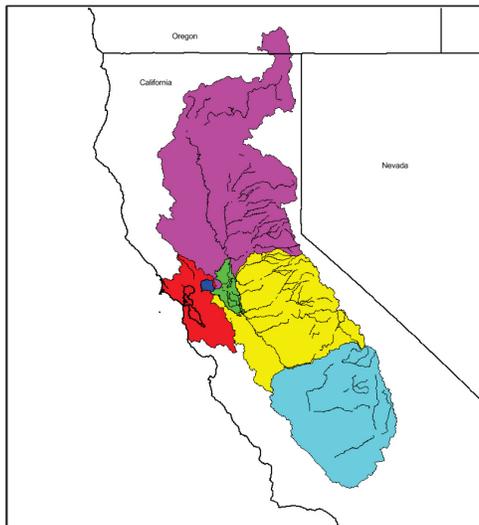
**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



Key Points and Definitions

For the purpose of this survey:

- The **San Francisco Bay Delta watershed** refers to the entire San Francisco Bay Delta estuary, its tributaries, and its watersheds, as shown in the shaded areas of the map below:



Source: GAO

- **Entity** refers to a group—such as a federal agency, state agency, local government office, or nongovernmental organization—that conducts water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed.
- **Partners** refer to other entities that work with your entity on projects, plans, or comprehensive regional strategies, such as the Comprehensive Conservation and Management Plan (CCMP) and the Delta Plan and/or EcoRestore.
- **Goals** refer to goals for projects, plans, or comprehensive regional strategies mentioned above.
- **Water quality improvement** refers to the physical, chemical, or biological characteristics of waters.

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



- **Water quality improvement and ecosystem restoration activities** could include activities or planning related to conservation, resiliency, mitigation, monitoring, and enhancement that directly or indirectly support water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed:
 - **Conservation:** projects or other activities intended to conserve or protect lands for biodiversity, microclimate, serpentine soil, wetlands, or watershed use.
 - **Resiliency:** projects or other activities intended to allow natural ecological processes to continue functioning in the changing climate.
 - **Mitigation:** projects or other activities intended to mitigate damages due to human usage and ongoing water programs, typically in response to regulation.
 - **Monitoring:** projects or other activities intended to monitor characteristics of the watershed, including monitoring for the purposes of establishing baselines, identifying trends, and assessing effectiveness/results of restoration activities.
 - **Enhancement:** projects or other activities intended to reestablish ecological processes while obtaining as much function from these projects for human activity.

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



Introductory Questions

1) Which of the following best describes your entity?

- 17 Federal government
- 12 State government
- 4 Local government
- 2 Regional government agency
- 9 Nongovernmental organization
- 1 Private industry
- 3 Other:

In responding to this survey, please consider all of the different ways your entity may have worked with other entities on water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed, such as on planning, project selection, project implementation, permitting, funding, technical assistance, and monitoring.

2) Has your entity worked with any of the following types of entities on water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed?

<u>Federal</u>		<u>Nonfederal</u>		<u>Type of Entities</u>
Yes	No	Yes	No	
17	0	29	2	Federal government
17	0	31	0	State government
14	2	29	2	Local government
14	2	29	2	Regional government agency
14	2	30	0	Nongovernmental organization
13	3	24	5	Private industry
7	3	9	3	Other:

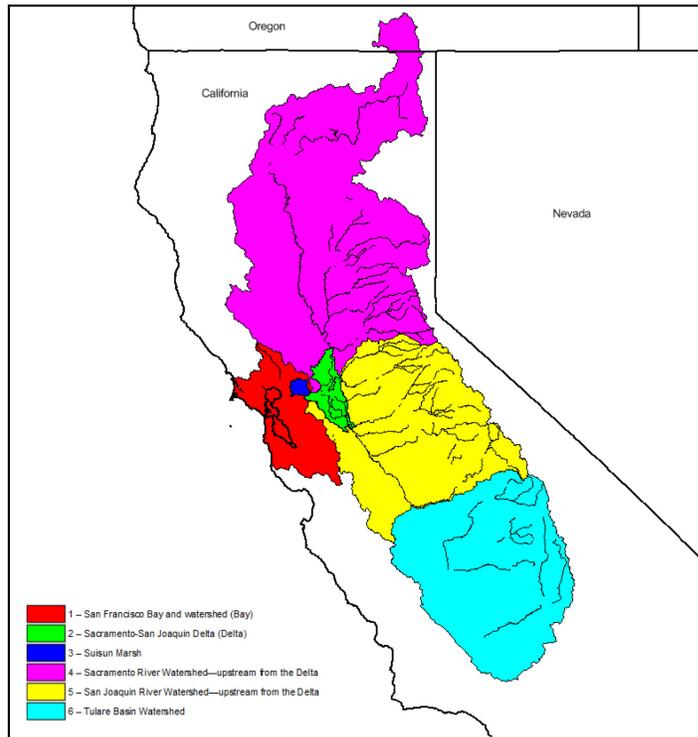
Note: In reporting these results, we use “Nonfederal” and “Nonfederal entities” to describe responses from entities identifying themselves as state government, local government, regional government agency, nongovernmental organization, private industry, and other.

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



3) Please identify the geographic subsection(s) of the San Francisco Bay Delta watershed in which your entity conducts water quality improvement and ecosystem restoration activities. Please indicate all that apply.

Federal	Nonfederal	
10	24	1 – San Francisco Bay and watershed (Bay)
12	20	2 – Sacramento-San Joaquin Delta (Delta)
11	20	3 – Suisun Marsh
11	14	4 – Sacramento River Watershed—upstream from the Delta
12	13	5 – San Joaquin River Watershed—upstream from the Delta
8	10	6 – Tulare Basin Watershed



Source: GAO

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Note: Responses from federal entities are counted under "F". Responses from Nonfederal entities are counted under "NF".

Challenges that May Limit Restoration Progress

4) The following is a list of possible challenges that may limit restoration progress in areas of the San Francisco Bay Delta watershed. Thinking about your entity's experiences in the geographic area(s) you identified in question 3, how much of a challenge, if at all, do you think the following pose to the water quality improvement and ecosystem restoration efforts?

Challenges that May Limit Restoration Progress	Very great challenge	Great challenge	Moderate challenge	Somewhat of a challenge	Slight/Not at all a challenge	Don't know/Not applicable
A. Planning for the effects of climate change	F:1 NF:13	F:12 NF:10	F:2 NF:7	F:1 NF:1	F:0 NF:0	F:1 NF:0
B. Planning for the effects of population growth, including increased urbanization and development (commercial or residential)	F:1 NF:7	F:8 NF:13	F:4 NF:6	F:2 NF:4	F:1 NF:0	F:1 NF:1
C. Competing interests of water users, including residential, commercial, agricultural, and environmental	F:12 NF:21	F:2 NF:7	F:1 NF:2	F:1 NF:0	F:0 NF:0	F:1 NF:1
D. Obtaining support for restoration efforts from local private stakeholders, such as farmers and businesses	F:2 NF:3	F:8 NF:4	F:5 NF:13	F:1 NF:8	F:0 NF:1	F:1 NF:2
E. Coordination of goals within geographic subsections of the watershed	F:1 NF:3	F:7 NF:6	F:6 NF:14	F:1 NF:6	F:1 NF:2	F:1 NF:0
F. Coordination of goals for the entire San Francisco Bay Delta watershed	F:5 NF:8	F:6 NF:12	F:4 NF:6	F:1 NF:4	F:0 NF:1	F:1 NF:0
G. Tracking progress towards goals within geographic subsections of the watershed	F:2 NF:1	F:5 NF:4	F:6 NF:15	F:4 NF:6	F:0 NF:4	F:0 NF:1
H. Coordination among partners at different levels of government (for example, federal, state, and local governments)	F:1 NF:5	F:9 NF:14	F:6 NF:8	F:1 NF:4	F:0 NF:0	F:0 NF:0

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



Note: Responses from federal entities are counted under "F". Responses from Nonfederal entities are counted under "NF".

Challenges that May Limit Restoration Progress	Very great challenge	Great challenge	Moderate challenge	Somewhat of a challenge	Slight/Not at all a challenge	Don't know/Not applicable
I. Coordination across a large number of partners	F:2 NF:2	F:10 NF:19	F:4 NF:8	F:1 NF:2	F:0 NF:0	F:0 NF:0
J. Coordination of scientific programs <u>within</u> geographic subsections of the watershed	F:1 NF:1	F:7 NF:6	F:5 NF:12	F:1 NF:8	F:2 NF:2	F:1 NF:2
K. Coordination of scientific programs across <u>the entire</u> San Francisco Bay Delta watershed	F:3 NF:5	F:9 NF:8	F:2 NF:11	F:1 NF:5	F:0 NF:1	F:2 NF:1
L. Using scientific knowledge to assess progress to update goals and measures	F:2 NF:2	F:9 NF:5	F:4 NF:14	F:1 NF:5	F:0 NF:4	F:1 NF:1
M. Obtaining sufficient <u>federal</u> funding for water quality improvement and ecosystem restoration activities	F:8 NF:20	F:5 NF:7	F:2 NF:3	F:1 NF:0	F:0 NF:0	F:1 NF:1
N. Obtaining sufficient <u>nonfederal</u> funding for water quality improvement and ecosystem restoration activities	F:4 NF:7	F:6 NF:12	F:5 NF:9	F:1 NF:1	F:0 NF:1	F:1 NF:1
O. Timing of obtaining <u>federal</u> funding	F:6 NF:7	F:5 NF:12	F:5 NF:6	F:1 NF:2	F:0 NF:0	F:0 NF:4
P. Timing of obtaining <u>nonfederal</u> funding	F:2 NF:4	F:5 NF:8	F:9 NF:13	F:0 NF:1	F:1 NF:0	F:0 NF:5
Q. Obtaining <u>federal</u> permits that align with project timeframes	F:3 NF:12	F:4 NF:7	F:7 NF:8	F:1 NF:1	F:0 NF:0	F:2 NF:3
R. Obtaining <u>nonfederal</u> permits that align with project timeframes	F:3 NF:8	F:4 NF:10	F:6 NF:8	F:1 NF:2	F:1 NF:0	F:2 NF:3
S. Other (please specify _____)	F:4 NF:1	F:2 NF:2	F:0 NF:1	F:0 NF:0	F:0 NF:0	F:1 NF:2

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



5) Thinking about your entity's experiences in the geographic area(s) identified in question 3, which three factors from the above list do you think pose the greatest risks to the long-term overall success of water quality improvement and ecosystem restoration efforts in the San Francisco Bay Delta watershed?

Factor #1 Click the down arrow (right) to pick a factor

Why do you think this factor poses one of the greatest risks to the long-term overall success of water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed? Please use the following space to elaborate in as much detail as possible and include illustrative examples.

Factor #2 Click the down arrow (right) to pick a factor

Why do you think this factor poses one of the greatest risks to the long-term overall success of water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed? Please use the following space to elaborate in as much detail as possible and include illustrative examples.

Factor #3 Click the down arrow (right) to pick a factor

Why do you think this factor poses one of the greatest risks to the long-term overall success of water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed? Please use the following space to elaborate in as much detail as possible and include illustrative examples.

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Note: Responses from federal entities are counted under "F". Responses from Nonfederal entities are counted under "NF".

Count		Factor
F	NF	
11	18	Competing interests of water users, including residential, commercial, agricultural, and environmental
10	14	Planning for the effects of climate change
7	17	Obtaining sufficient federal funding for water quality improvement and ecosystem restoration activities
1	10	Obtaining federal permits that align with project timeframes
3	5	Planning for the effects of population growth, including increased urbanization and development (commercial or residential)
2	4	Coordination among partners at different levels of government (for example, federal, state, and local governments)
2	4	Using scientific knowledge to assess progress to update goals and measures
1	5	Obtaining sufficient nonfederal funding for water quality improvement and ecosystem restoration activities
5	1	Coordination of scientific programs across the entire San Francisco Bay Delta watershed
3	2	Obtaining support for restoration efforts from local private stakeholders, such as farmers and businesses
2	3	Coordination across a large number of partners
2	1	Coordination of goals for the entire San Francisco Bay Delta watershed
0	3	Obtaining nonfederal permits that align with project timeframes
0	2	Coordination of goals within geographic subsections of the watershed
1	0	Timing of obtaining federal funding
1	0	Tracking progress towards goals within geographic subsections of the watershed
0	0	Timing of obtaining nonfederal funding
0	0	Coordination of scientific programs within geographic subsections of the watershed
0	0	Other

Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities

**This page only appeared on the version of this survey questionnaire provided to nonfederal entities.
As a result, the responses are for nonfederal entities only.**



U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Federal Actions

6) How familiar is your entity with the Interim Federal Action Plan for the California Bay-Delta ([available here](#)) created on December 22, 2009?

- 11 Not at all familiar (*Skip to question 9*)
- 9 Slightly familiar
- 7 Somewhat familiar
- 3 Very familiar
- 1 Extremely familiar

7) What, if any, are primary strengths of the Interim Federal Action Plan for the California Bay-Delta in assisting your entity with water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed?

8) What, if any, are primary shortcomings of the Interim Federal Action Plan for the California Bay-Delta in assisting your entity with water quality improvement and ecosystem restoration activities in the San Francisco Bay Delta watershed?

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



Federal Actions

9) Thinking about your entity's responsibilities related to water quality improvement and ecosystem restoration, how important would it be to have the following types of reports available to your entity when it carries out activities related to these responsibilities?

Types of Reports	How Important <i>(Please select one rating for each type of report.)</i>	
	Federal	Nonfederal
A. Accomplishments of federal and non-federal entities in achieving the objectives of water quality improvement and ecosystem restoration activities	0 3 4 7 3 0	0 Not at all important 2 Slightly important 11 Moderately important 11 Very important 6 Extremely important 1 Don't know/Not applicable
B. Progress of federal and nonfederal entities in implementing water quality improvement and ecosystem restoration activities	0 2 4 8 3 0	0 Not at all important 3 Slightly important 6 Moderately important 14 Very important 7 Extremely important 1 Don't know/Not applicable
C. All federal funding spent (i.e., expenditures) implementing water quality improvement and ecosystem restoration activities	2 3 5 3 4 0	0 Not at all important 3 Slightly important 10 Moderately important 11 Very important 6 Extremely important 1 Don't know/Not applicable
D. All state funding spent (i.e., expenditures) implementing water quality improvement and ecosystem restoration activities	2 3 5 4 3 0	0 Not at all important 3 Slightly important 10 Moderately important 11 Very important 6 Extremely important 1 Don't know/Not applicable

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Note: Responses from federal entities are counted under "F". Responses from Nonfederal entities are counted under "NF".

E. All federal funding committed to be spent (i.e., obligations) on water quality improvement and ecosystem restoration activities	2	0	Not at all important
	4	2	Slightly important
	5	6	Moderately important
	4	14	Very important
	2	7	Extremely important
	0	2	Don't know/Not applicable
F. All state funding committed to be spent (i.e., obligations) on water quality improvement and ecosystem restoration activities	2	0	Not at all important
	4	2	Slightly important
	6	8	Moderately important
	3	13	Very important
	2	6	Extremely important
	0	2	Don't know/Not applicable

10) Please describe how your entity may use the reports it would consider at least slightly important. If possible, please include illustrative examples.

11) Is there any additional information not included in the table above that, if regularly reported, your entity would find useful in carrying out its responsibilities related to water quality improvement and ecosystem restoration?

F	NF	
7	11	Yes
9	18	No (<i>Skip to question 9</i>)

a) If yes, please explain.

b) What entity do you feel would be in the best position to consistently report such information?

**Appendix III: Summary Results of GAO Survey
Questionnaire of Federal and Nonfederal
Entities**



12) Going forward, what do you consider to be the most important action that could be taken at a federal level to help improve San Francisco Bay Delta watershed restoration efforts? If applicable, please identify the issue(s) or needs this action may address and the extent to which it relates to particular geographic subsections of the San Francisco Bay Delta watershed.

Contact Information

13) Who from your entity could GAO contact with any follow-up questions?

Name	
Title	
E-mail	
Phone #	
Entity	

Thank you for completing these questions. We appreciate your assistance.
Please make sure to save the completed file on your computer before sending it back to GAO at SFBayDeltaReview@gao.gov.

Appendix IV: Comments from the Department of the Interior



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

JUL 9 2018

Mr. J. Alfredo Gomez
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Gomez:

Thank you for providing the Department of the Interior (Department) the opportunity to review and comment on the draft U.S. Government Accountability Office (GAO) report entitled, *San Francisco Bay Delta Watershed: Wide Range of Restoration Efforts Need Updated Federal Reporting and Coordination Roles* (GAO-18-473). We appreciate GAO's review of the coordination of watershed restoration efforts among Federal and non-federal entities.

GAO issued three recommendations to the Department.

Recommendation 1: The Secretary of the Interior should work with the Council on Environmental Quality to update and revise the Interim Federal Action Plan for the California Bay-Delta to outline and reflect entity roles and responsibilities in light of changes in the state of California's role and other relevant developments since 2009.

Response: Partially Concur. The Department believes revisiting the Interim Federal Action Plan is not the most efficient course of action as the Delta Plan Inter-agency Implementation Committee (DPIIC) serves as the coordination group. The Department will continue to actively participate in DPIIC. The DPIIC includes participation and leadership from federal agencies at both the regional and Washington office levels. In addition, the Department's bureaus are concurrently engaged with the State of California in multiple activities in the Bay-Delta that span their respective mission areas. These actions are broadly summarized in the annual CALFED Bay-Delta Federal Budget Crosscut¹, as referenced in the GAO's draft report.

Recommendation 2: The Secretary of the Interior should notify all participating entities to ensure they are aware of the Interim Federal Action Plan and their role in it.

Response: See response to recommendation #1.

¹ <https://www.whitehouse.gov/wp-content/uploads/2018/02/bay-delta-fy2019.pdf>

Recommendation 5: The Secretary of the Interior should coordinate with appropriate state entities to obtain and report the information available to meet the requirements under section 105 of the CALFED Act.

Response: Partially Concur. The Delta Stewardship Council compiles and reports on funding information and progress for Federal and state agencies. The Department could seek to coordinate with the state to modify that report for any information not currently reported by the Council or in the aforementioned Crosscut documents.

The enclosure contains technical comments for your consideration when finalizing the report.

If you have any questions or need additional information, please contact Elizabeth Cordova-Harrison at (303) 445-2783, or via e-mail at ecordovaharrison@usbr.gov.

Sincerely,



Scott J. Cameron
Principal Deputy Assistant Secretary
for Policy, Management and Budget
Exercising the Authority of the
Assistant Secretary for Policy,
Management and Budget

Enclosure

Appendix V: Comments from the California Delta Stewardship Council



DELTA STEWARDSHIP COUNCIL *A California State Agency*

980 NINTH STREET, SUITE 1500
SACRAMENTO, CALIFORNIA 95814
HTTP://DELTACOUNCIL.CA.GOV
(916) 445-5511

July 9, 2018

J. Alfredo Gómez
Director, Natural Resources and Environment
Government Accountability Office
441 G Street NW
Washington, D.C. 20226

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Michael Gatto
Maria Mehranian
Susan Tatayon
Skip Thomson
Ken Weinberg

Executive Officer
Jessica R. Pearson

RE: GAO Report to the House Committee on Transportation and Infrastructure: San Francisco Bay Delta Watershed

Dear Mr. Gómez,

Thank you for the opportunity to comment on the Government Accountability Office's (GAO) Report on restoration efforts in the San Francisco Bay Delta Watershed.

The Delta Stewardship Council (Council) is an independent State agency charged with furthering California's coequal goals of achieving a more reliable water supply and restoring the Delta ecosystem, all while protecting and enhancing the Delta's cultural, recreational, and agricultural values. This objective is addressed through the Council's implementation of a science-based, legally-enforceable, long-term management framework known as the Delta Plan.

In general, Council staff agrees with the sum of the report's recommendations on improving coordination among State and federal agencies, the development of a revised framework to guide federal action in the watershed, and renewing efforts to track expenditures for performance management purposes.

Specifically, Council staff would like to offer the following comments on the themes outlined in the recommendations of the report.

Coordination through Delta Plan Interagency Implementation Committee. No entity in California has the sole responsibility or authority for managing water supply and the Delta ecosystem. Instead, authority, expertise, and resources are spread out among a cadre of federal, State, and local agencies, with no single government agency empowered to provide leadership or a long-term vision. This is why the establishment of the Delta Stewardship Council, with its regulatory and collaborative role, is fundamentally different from past approaches to managing the Delta. It is this structure that enables the Council to facilitate coordination across the broad range of objectives needed to further the State's coequal goals.

"Coequal goals" means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place."

– CA Water Code §85054

Appendix V: Comments from the California
Delta Stewardship Council

Mr. J. Alfredo Gomez
Director, Natural Resources and Environment
Government Accountability Office
July 9, 2018
Page 2

As your report appropriately points out, the Council-led Delta Plan Interagency Implementation Committee (DPIIC) plays a vital role as the coordinating body for 17 State and federal agencies operating in the Delta. The semiannual meetings cover priority discussions topics highlighted in the report, including ecosystem restoration goals, streamlined permitting, best-available science, performance measures, and annual progress reporting on agency efforts. Federal agencies have been integral to DPIIC and their continued participation in DPIIC is critical to its future success. We encourage the federal agencies to continue to attend and actively participate.

Coordination across Bay, Delta, and Watershed. There is long history of coordination among professionals working in the Bay-Delta systems, as evidenced by events such as the biennial State of the Estuary Conference, and in alternate years, the Bay Delta Science Conference. In recent years coordination between the Bay and Delta has also been strengthened through efforts like the San Francisco Estuary Blueprint (i.e., Comprehensive Conservation and Management Plan) which offers a real opportunity to achieve the level of coordination across the Bay and the Delta that are necessary to overcome the challenges presented in your report. Through DPIIC, the Council has been working closely with the Estuary Blueprint Implementation Committee, and in 2017, the Council signed an MOU with the Aquatic Science Center and San Francisco Estuary Institute to further communication, coordination, and critical science investigations across the Bay and Delta. Ultimately, the presence of such unifying bodies result in improved communication, reduced conflict, and greater operational efficiencies through the development of common goals and objectives.

Given that the upper watershed, as defined in this report, currently lacks a collaborative structure such as DPIIC, further exploration as to how this gap could be filled should be explored.

Revised Federal Action Plan. While the primary focus of this report relates to restoration in the region, the 2009 Interim Federal Action Plan covered a variety of topics beyond restoration, including water supply and efficiency, water quality, and integrated flood risk management. To that end, development of a revised Federal Action Plan should take a similar integrated approach, given the interconnectedness of these variables.

The Council is not currently in contact with representatives from the Council on Environmental Quality (CEQ), Office of Management and Budget (OMB), or the Federal Bay-Delta Leadership Committee. Should a revised federal action plan be pursued, we would welcome the opportunity to coordinate with such entities. Any development of a revised Federal Action Plan should be done through a public, stakeholder-driven process and the plan should be guided by the best available science, include relevant performance measures to track progress, and adaptively managed as system needs and conditions change. In addition, to the extent possible and appropriate, a revised Plan should consider and build-upon existing planning frameworks such as the Delta Plan and the San Francisco Estuary Blueprint.

Budget/Performance Tracking. According to the 2013 Delta Plan, since the CALFED Bay-Delta Program was instituted in 1995, an estimated \$400 million has been spent annually, on average, by federal, State, and local water users.

A robust budget and performance measurement strategy enables agencies to track progress towards meeting desired objectives, supports the ability of agencies to adaptively manage projects and programs, and provides a certain degree of demonstrable accountability for each agency. For instance, the Council compiles data from

**Appendix V: Comments from the California
Delta Stewardship Council**

Mr. J. Alfredo Gomez
Director, Natural Resources and Environment
Government Accountability Office
July 9, 2018
Page 3

numerous public agencies to inform the Delta Plan's 160 performance measures and effectively track progress towards achieving the coequal goals.

Should a revised Federal Action Plan be pursued, it would be prudent to assess current budget allocations of the relevant agencies to ensure that adequate resources are in place to effectively implement the revised Plan's objectives.

As noted in your report, Council staff would welcome the opportunity to contribute to the CALFED budget crosscut reports. The Council, through its leadership in DPIIC, is currently gathering Delta scientific investment information from State and federal agencies in order to better understand the scope of existing Delta science funding, and how that aligns with the ongoing science needs of the Delta.

The Role of Levees in the Delta. While the report is thorough in discussing many of the major aspects of the system like ecosystem restoration, it neglects flood protection and the importance of levees, particularly in the Delta. Levees are vital to nearly every aspect of the Delta. For instance, the channels that convey water through the Delta to users in the Bay Area, San Joaquin Valley, and Southern California, and the islands that prevent saltwater intrusion into the Delta, depend upon levees. While levees have severed the land-water connection so critical to ecosystem function, many birds, such as waterfowl or sandhill cranes, thrive in areas that depend on levees for their management. Changes in the area protected by levees also alter water circulation through the Delta, changing the benefit of flows released to protect its ecosystem. Finally, the Delta's residents, farms, and businesses also depend on its levees. In fact, the Delta Protection Commission's Economic Sustainability Plan refers to Delta levees "as the foundation on which the entire Delta economy is built."

In 2014, the U.S. Army Corps of Engineers found that there is not a federal interest in providing funding for and implementing flood risk management and ecosystem restoration improvements in the Delta. Given the importance of Delta levees, including their role in water supply reliability for the State Water Project and the Central Valley Project, Council staff have [encouraged](#) the U.S. Army Corps of Engineers to revisit its 2014 finding that there is not a federal interest in providing funding for and implementing flood risk management and ecosystem restoration improvements in the Delta.

Delta as an Evolving Place. Finally, the report mentions the State's coequal goals for the Delta of providing a more reliable water supply for California and protecting and enhancing the Delta's ecosystem; however, the report should explicitly recognize and consider the associated goal of protecting and enhancing the Delta as an evolving place.

Once again, we appreciate the opportunity to comment on this report. Should you have any questions, please contact me at (916) 445-5553 or Ryan Stanbra, Legislative and Policy Advisor, at (916) 445-0641.

Sincerely,



Jessica R. Pearson
Executive Officer
Delta Stewardship Council

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

J. Alfredo Gómez, (202) 512-3841 or gomezj@gao.gov

Staff Acknowledgments

In addition to the individual named above, Janet Frisch (Assistant Director), Susan Iott (Assistant Director), Chad M. Gorman (Analyst-in-Charge), Chuck Bausell, Stephen Betsock, Mark Braza, Marissa Dondoe, Ellen Fried, Carol Henn, Karen Howard, Richard Johnson, Gwen Kirby, Ben Licht, John Mingus, Tricia Moye, Rebecca Parkhurst, Sara Sullivan, Sarah Veale, Michelle R. Wong, Elizabeth Wood, and Edith Yuh made key contributions to this report.

Related GAO Products

Great Lakes Restoration Initiative: Improved Data Collection and Reporting Would Enhance Oversight. [GAO-15-526](#). Washington, DC: July 21, 2015.

Bureau of Reclamation: Financial Information for Three California Water Programs. [GAO-15-468R](#). Washington, DC: June 4, 2015.

Great Lakes Restoration Initiative: Further Actions Would Result in More Useful Assessments and Help Address Factors That Limit Progress. [GAO-13-797](#). Washington, DC: September 27, 2013.

Chesapeake Bay: Restoration Effort Needs Common Federal and State Goals and Assessment Approach. [GAO-11-802](#). Washington, DC: September 15, 2011.

Recent Actions by the Chesapeake Bay Program Are Positive Steps Toward More Effectively Guiding the Restoration Effort, but Additional Steps Are Needed. [GAO-08-1131R](#). Washington, DC: August 28, 2008.

Coastal Wetlands: Lessons Learned from Past Efforts in Louisiana Could Help Guide Future Restoration and Protection. [GAO-08-130](#). Washington, DC: December 14, 2007.

South Florida Ecosystem: Restoration Is Moving Forward but Is Facing Significant Delays, Implementation Challenges, and Rising Costs. [GAO-07-520](#). Washington, DC: May 31, 2007.

Chesapeake Bay Program: Improved Strategies Are Needed to Better Assess, Report, and Manage Restoration Progress. [GAO-06-96](#). Washington, DC: October 28, 2005.

Great Lakes: Organizational Leadership and Restoration Goals Need to Be Better Defined for Monitoring Restoration Progress. [GAO-04-1024](#). Washington, DC: September 28, 2004.

Watershed Management: Better Coordination of Data Collection Efforts Needed to Support Key Decisions. [GAO-04-382](#). Washington, DC: June 7, 2004.

Great Lakes: An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals. [GAO-03-515](#). Washington, DC: April 30, 2003.

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