Chapter 1
Introduction

The California Department of Water Resources (DWR), in coordination with the U.S. Department of the Interior (DOI), Bureau of Reclamation (Reclamation), proposes to implement the South Delta Improvements Program (SDIP) to improve water quality, water conveyance, and fish habitat conditions in the south Sacramento–San Joaquin River Delta (Delta). This chapter contains background information on DWR and Reclamation, summarizes the purpose of this environmental impact statement/environmental impact report (EIS/EIR), describes the relationship of SDIP to the CALFED Bay-Delta Program (CALFED Program), and the purpose of and need for the proposed SDIP, including background discussion supporting the purpose of and need for the project. See Chapter 2, "Project Description," for a detailed description of the proposed project alternatives.

DWR was created in 1956 to manage the water resources of California in cooperation with other agencies, to benefit the state's people, and to protect, restore, and enhance the natural and human environments. One of DWR's primary responsibilities is operations and maintenance (O&M) of the State Water Project (SWP), which delivers water to agricultural and municipal and industrial (M&I) contractors in the Central Valley, the San Francisco Bay Area, and central coast and southern California.

Reclamation was established in 1902 to assist in meeting the increasing water demands of the West while protecting the environment and the public's investment in these structures. Today, Reclamation is the largest wholesaler of water in the country and the second largest producer of hydroelectric power in the western United States. Reclamation's mid-Pacific region is responsible for the management of the Central Valley Project (CVP), which delivers water to more than 250 contractors throughout California.

DWR and Reclamation are coordinating the development and implementation of the SDIP because of the interrelated nature of CVP and SWP operations, and based on the 1987 Coordinated Operations Agreement (COA). Through this agreement, DWR and Reclamation coordinate the operations of the SWP and CVP to meet the various Delta regulatory requirements.

DWR and Reclamation are also identified in the CALFED Programmatic Record of Decision (CALFED ROD) (CALFED Bay-Delta Program 2000a) and State Water Resources Control Board (State Water Board) Decision 1641 (D-1641)

(State Water Resources Control Board 2000) as leaders of the effort to implement SDIP water supply conveyance improvements. DWR and its federal counterparts (through Public Law 108-361) are directed to manage program elements contained in the CALFED Conveyance Program. DWR is implementing the SDIP to meet a long-standing agreement with the South Delta Water Agency and, ultimately, as part of the CALFED Conveyance Program to improve conveyance and local agricultural diversion conditions in the south Delta, while enhancing ecosystem benefits.

Reclamation is authorized to construct a barrier at the head of Old River to be operated on a seasonal basis to increase the survival of young outmigrating salmon in a manner that does not significantly impair the ability of local entities to divert water (Central Valley Project Improvement Act, 3406(b)(15)).

Purpose of This EIS/EIR

This document is a joint EIS/EIR and satisfies the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) for disclosing environmental impacts and recommended mitigation measures related to a proposed action and alternatives prior to making a decision on project approval. The EIS/EIR, and the associated Action Specific Implementation Plan (ASIP) will provide the needed information for DWR, Reclamation, the National Marine Fisheries Service (NOAA Fisheries), the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (DFG) to support compliance with the federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), and the Natural Communities Conservation Planning Act (NCCPA) and will provide needed information for the U.S. Army Corps of Engineers (Corps) and the Regional Water Quality Control Board (RWQCB) in Clean Water Act (CWA) Section 404 and 401 applications, as well as information necessary for the Corps to issue a Rivers and Harbors Act Section 10 permit (Jones & Stokes 2004a). It will be used by local, state, and federal agencies to identify, evaluate, and disclose significant environmental impacts of the proposed action and alternatives as described below.

DWR has determined that preparation and certification of an EIR to satisfy CEQA (Public Resources Code, Section 21000 *et seq*.) is required before approval of the SDIP proposed action. DWR is the lead agency under CEQA. The primary purpose of an EIR is to identify and publicly disclose any significant environmental impacts that may result from implementation of a project and to identify feasible alternatives, mitigation measures, and modifications to the project that would reduce those impacts. State responsible and trustee agencies, such as the State Water Board and DFG may rely on the EIR to satisfy CEQA for their individual project approvals. DFG, as a responsible agency, may rely on the EIS/EIR and the associated ASIP to issue a permit to DWR in compliance with the NCCPA and CESA.

Pursuant to Section 15126(d) of the State CEQA Guidelines, an EIR must describe and evaluate a reasonable range of alternatives that would feasibly attain most of the basic project objectives and would avoid or substantially lessen any significant impact of the project as proposed. The guidelines state that the range of alternatives required to be evaluated in an EIR is governed by the "rule of reason": the EIR needs to describe and evaluate only those alternatives necessary to permit a reasoned choice and to foster informed decision-making and public participation.

Under NEPA and the Council on Environmental Quality's (CEQ's) NEPA regulations (Title 40, Code of Federal Regulations [CFR], Section 1500 *et seq*.), federal agencies are required to evaluate the environmental effects of an action, including feasible alternatives, and identify mitigation measures to minimize adverse effects when they propose to carry out, approve, or fund a project that may have a significant effect on the environment. Reclamation has determined that its involvement in SDIP decision-making and funding requires compliance with NEPA and preparation of an EIS. Reclamation is the federal lead agency under NEPA. Other federal agencies, such as the Corps, may rely on this EIS to satisfy NEPA for their individual approvals of SDIP components.

DWR and Reclamation have determined that this combined EIS/EIR is the most appropriate means to comply with both CEQA and NEPA because of the complex nature of this project, need for coordination among federal and state agencies, and the need to complete environmental review as expeditiously as possible. This document incorporates environmental review required under multiple federal, state, and local permits and regulations (see Chapter 8, "Compliance with Applicable Laws, Policies, and Plans and Regulatory Framework").

Six project alternatives were selected to be analyzed in this EIS/EIR based on a rigorous alternatives screening and selection process (refer to Chapter 2, "Alternatives Screening," and Appendix A). The following sections describe the SDIP's relationship to the CALFED Program, purpose and objectives of the SDIP, need for the SDIP, and background discussion supporting the purpose of and need for the project. Identification of the project purpose and need for the project is required by CEQA and NEPA and is one of the key criteria used in developing a reasonable range of project alternatives.

CEQA Responsible and Trustee Agencies

This EIS/EIR will be used by Responsible and Trustee Agencies to determine the effects of the proposed project. Responsible Agencies are those that have a legal responsibility to approve the project. These agencies are required to rely on the Lead Agency's environmental document in acting on whatever aspect of the project requires its approval, but must prepare and issue its own findings regarding the project (CEQA Guidelines Section 15096). Trustee Agencies are those that have jurisdiction over certain resources held in trust for the people of California but do not have legal authority over approving or carrying out the

project. Responsible and Trustee Agencies for the SDIP are presented in Table 1-1.

Table 1-1. Responsible and Trustee Agencies

Agency	Jurisdiction
Trustee	
Department of Fish and Game	Fish and wildlife
	Native plants designated as rare or endangered
	Game refuges
	Ecological reserves
State Lands Commission	State-owned "sovereign" lands
Responsible	
Department of Fish and Game	Fish and wildlife
	Native plants designated as rare or endangered
	Game refuges
	Ecological reserves
Office of Historic Preservation	Historic and cultural resources
Reclamation Board	Levee modifications
Air Resources Board	Air quality
Regional Water Quality Control Board (#5)	Discharges to water bodies

Relationship to the CALFED Bay-Delta Program

The CALFED Program is a cooperative effort of 25 state and federal agencies with regulatory and management responsibilities in the San Francisco Bay/Sacramento–San Joaquin River Delta (Bay-Delta) to develop and implement a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The objective of the collaborative planning process is to identify comprehensive solutions to the problems of ecosystem quality, water delivery reliability, water quality, and Delta levee integrity.

In July 2000, the CALFED agencies released the final Programmatic EIS/EIR, which analyzed a range of alternatives to solve Bay-Delta system problems. In August 2000, the CALFED agencies adopted a preferred alternative that included measures to reduce potential conflict between stakeholders and provide an adequate water supply for all beneficial uses of water.

The Preferred Program Alternative described in the CALFED ROD is a long-term plan that includes a variety of different potential actions to be implemented over the next 30 years by numerous public and private entities to improve the health of the Bay-Delta Estuary. Among the potential actions are several that would change how water is conveyed through the Delta. The Preferred Program Alternative employs a through-Delta approach to water conveyance, with modifications expected to result in improved water delivery reliability, protection and improvement of Delta water quality, ecosystem restoration, and reduced risk of supply disruption attributable to catastrophic breaching of Delta levees (CALFED ROD, p. 23.) To this end, the CALFED preferred alternative as described in the CALFED ROD incorporates actions in the south Delta that have been under study and development by DWR and Reclamation since the 1980s. These actions included installing flow and fish control structures in certain south Delta channels and incrementally reaching the maximum diversion and pumping capability at the SWP's Clifton Court Forebay (CCF) and Harvey O. Banks Pumping Plant (SWP Banks).

In the CALFED Programmatic Environmental Impact Statement/Environmental Impact Report (Programmatic EIS/EIR) and the CALFED ROD, the CALFED Program set out components of the Preferred Program Alternative. In Chapter 2, Decision, Section 2.2, Plan for Action, 2.2.6 Conveyance, of the CALFED ROD, the following information is outlined in relation to SDIP:

> The specific actions listed below are components of, or are directly related to, the "South Delta Improvement Program" which has been under study and development for a number of years. The CALFED agencies intend for these actions in the south Delta to address the needs of the export projects, the Delta ecosystem, and local in-Delta agricultural water users. These components will go forward following the completion of project-specific environmental review and permitting. DWR will lead the CALFED agencies in implementing these south Delta actions. Environmental review will be completed by the end of 2002. These actions, related to providing for more reliable long-term export capability by the SWP and CVP and protection of local diversions in the Delta, are in addition to historic and current efforts (including annual installation of temporary barriers as well as current year local dredging and diversion improvements) (CALFED ROD, p. 48).

The following specific actions are listed in the CALFED ROD:

- Increase SWP pumping from the current limit from March 15 to December 15 to 8,500 cfs; and modify existing pumping criteria from December 15 to March 15 to allow greater use of SWP export capacity.
- Increase SWP pumping to the maximum capacity of 10,300 cfs[1]
  - Design and construct new fish screens at CCF and CVP Tracy Pumping Plant (CVP Tracy) facilities to allow the export facilities to pump at full capacity more regularly;

[1] The SWP Banks Pumping Plant is currently operated to its full capacity (10,300 cfs), however, the regular use of the full capacity is limited by the diversion of water into CCF. The SDIP EIS/EIR discloses the environmental effects of implementing the first increment of that diversion (8,500 cfs). Before increasing the diversion above the 8500 cfs level, additional environmental review would be undertaken.

  - Dredge and install operable barriers to ensure water of adequate quantity and quality to agricultural diverters within the south Delta. This would include installation of an operable Grant Line Canal barrier, which would be constructed and operated in accordance with conditions and directions specified by the USFWS, DFG, and NOAA Fisheries. The CALFED ROD commits to seeking funding and authority to complete barriers on Middle River, Old River, and Grant Line Canal by the end of 2007.

- Design and construct floodway improvements on the lower San Joaquin River to provide conveyance, flood control, and ecosystem benefits.
- Reduce agricultural drainage in the Delta.

Currently, two of the above actions are proposed in the SDIP:

- Increase SWP pumping from the current limit from March 15 to December 15 to 8,500 cfs; and modify existing pumping criteria from December 15 to March 15 to allow greater use of SWP export capacity.
- Dredge and install operable barriers (now referred to as "gates") to ensure water of adequate quantity and quality to agricultural diverters within the south Delta.

The remaining actions are being pursued as separate projects or will be pursued in the future. These actions are:

- As noted in footnote 1, increasing SWP pumping to the maximum capability of 10,300 cfs would require fish screens to protect threatened, endangered, and other sensitive fish species. The Tracy Fish Collection Facility project as described in the CALFED ROD has not been implemented, and has been delayed indefinitely, primarily because of concerns about costs. However, Reclamation and other CALFED agencies are currently considering improvement of the existing Tracy Fish Collection Facility. The salvage performance of the existing Tracy Fish Collection Facility could be improved through actions such as improved debris management methods, improved hydraulic control, and improved predation management. Studies are presently underway to help determine the best method for achieving the improvement objectives listed above. It is expected that some improvements will be implemented as soon as 2006. Others will likely not be implemented until future years.
- Specific floodway improvements on the San Joaquin River have not yet been determined. DWR is coordinating with the Corps as the Corps develops the feasibility study.
- The Old River and Rock Slough Water Quality Improvements Project is currently underway to reduce agricultural drainage in the Delta. The Contra Costa Water District (CCWD) published a public draft Mitigated Negative Declaration for the Old River–Byron Tract Water Quality Improvement Project in winter 2003, and for the Rock Slough–Veale Tract Water Quality Improvement Project in January 2004. These projects are expected to be implemented by fall 2005.

The CALFED ROD (page 52) also lists Complementary Actions to the SDIP. They are:

- Install and operate temporary barriers in the south Delta until fully operable barriers (now referred to as "gates") are constructed as the SDIP is implemented.
- Take actions to protect navigation and protect local diverters in the south Delta who are not adequately protected by the Temporary Barriers Program. Action that needs to be taken to protect these diverters may include installation and operation of portable pumps, limited project-specific dredging of intakes, and/or project-specific modification to diversion structures including the conversion of siphons to pumps.

DWR intends to continue to implement the Temporary Barriers Program until permanent gates are operable and to extend and dredge around existing agricultural diversions.

All the components of the SDIP are discussed in greater detail in Chapter 2, "Project Description."

The operational changes at the pumps, channel dredging, and operational gates that are part of the SDIP were contemplated as part of the through-Delta approach to conveyance in the CALFED ROD. However, SDIP, independent of other through-Delta conveyance actions, could contribute to the overall CALFED Program objectives even if other elements of the Program change and evolve over time. (CALFED Bay Delta Program 2000a, p. 23.) At the same time, the proposed physical/structural component for the SDIP (consisting of operable gates, modification of local agricultural diversions, and dredging) would have independent utility as a program identified in State Water Board D-1641 to help DWR and Reclamation meet conditions of their water right permits to implement water quality objectives for agricultural beneficial uses in the south Delta (D-1641, p. 87, 159–161), and to comply with the Central Valley Project Improvement Act (CVPIA), Pub. L. 102-575, to construct a fish control gate at the head of Old River.

The SDIP meets the policy commitments described in the CALFED ROD that each project implementing the CALFED Program would be subject to the appropriate type of environmental analysis and will evaluate and use the appropriate programmatic mitigation strategies described in the Programmatic EIS/EIR and the CALFED ROD. (*Id*., pp. 29–30, 32–35, & Appendix A.) Further, the SDIP is consistent with the recently enacted California Bay-Delta Act, which charges DWR with implementing the conveyance element of the CALFED Program.

Relationship to the Delta Improvements Package

The Delta Improvements Package (DIP) was developed by the California Bay Delta Authority in coordination with stakeholders to outline the process for

implementing a series of projects, including the SDIP. The DIP clarifies the roles, responsibilities, and commitments of the state and federal agencies in the implementation of programs, projects, evaluations, and other undertakings focused on the Delta region that advance the CALFED Program goals in the areas of water delivery reliability, water quality, ecosystem restoration, Delta levee integrity, and science.

The state and federal agencies are coordinating their assumptions and schedules to move forward with a set of activities focused on the Delta that are consistent with the CALFED Program's principle of balanced implementation. Coordination of these key activities, including the SDIP, will help the state and federal agencies avoid the conflict and gridlock that the CALFED program was created to address. Readers who desire more information about the DIP may wish to review the web page resources at < http://calwater.ca.gov/>.

Relationship to the CALFED Bay-Delta Programmatic Environmental Impact Statement/ Environmental Impact Report

The Programmatic EIS/EIR provides an analysis of the general effects of implementing the multiple components of the CALFED Program over a 30-year period, across two-thirds of the state. The impacts analysis in the Programmatic EIS/EIR was not intended to address site-specific environmental effects of individual projects. Accordingly, the direct, indirect, and cumulative impacts analysis of the Programmatic EIS/EIR is not sufficiently detailed for purposes of making a decision on SDIP. The SDIP EIS/EIR focuses on a specific project and specific affected geographic areas over a different time frame. The Programmatic EIS/EIR was used only to develop background information and provide mitigation guidance. This SDIP EIS/EIR stands alone, and includes an independently developed analysis of the impacts of the SDIP, including direct, indirect, and cumulative impacts, alternatives, and avoidance/mitigation measures.

Readers who desire more information about the CALFED Program, the Programmatic EIS/EIR, the Programmatic ROD, or the new California Bay-Delta Authority (CBDA) may wish to review the following web page resources and documents, which are available from CBDA at 650 Capitol Mall, 5th Floor, Sacramento, CA 95814, (916) 445-5511:

- Final Programmatic Environmental Impact Statement/Environmental Impact Report (July 2000), including technical appendices;
- Programmatic Record of Decision, Volumes 1–3, (August 28, 2000); and
- <http://calwater.ca.gov>.

The SDIP EIS/EIR has drawn upon specific information contained in the Programmatic EIS/EIR in the following chapters and sections:

- Chapter 1, "Introduction": background information;
- Chapter 2, "Project Description": Environmental Commitments;
- Section 5.5, Flood Control and Levee Stability: background information on existing flood control structures and their stability;
- Section 6.6, Vegetation and Wetlands: land cover types and occurrence of some vegetation species in the south Delta area;
- Section 6.3, Wildlife: occurrence of some habitat types in the south Delta and the development of significance criteria;
- Section 7.6, Visual/Aesthetics Resources: description of aesthetic character of south Delta and the development of significance criteria; and
- Section 7.9, Environmental Justice: development of significance criteria.

In addition, mitigation measures as identified in Appendix A of the CALFED ROD were incorporated where necessary and feasible. Specific measures applicable to the project are listed in the appropriate resource sections.

Need for Action

The SDIP addresses the needs of the Delta aquatic environment, as well as longstanding statewide, regional, and local water supply needs. Fish survival as well as water quality and quantity in the south Delta is affected by the natural split of San Joaquin River flow at the head of Old River; tidal fluctuation; local diversions; local agricultural return flows; channel capacity resulting in restricted circulation; and water exports. The SDIP is proposed in response to three important water management needs:

- Under natural conditions, about half the flow in the San Joaquin River flowed down Old River. The operations of the SWP and CVP export facilities in the south Delta can change flow patterns in the local channels. These factors can cause migrating San Joaquin River fall-/late fall–run Chinook salmon, a candidate for listing under the federal Endangered Species Act, to move into the south Delta, primarily through Old River where fish mortality increases due to predators and higher levels of exposure to export facilities and agricultural diversions. Keeping fall- and late fall–run Chinook salmon in the main channel of the San Joaquin River until they reach the central Delta may increase survival.
- Local south Delta water users downstream of the head of Old River are affected by water quality and water levels at each intake location. Water levels are influenced by many factors, one of which is diversions in the south Delta by the SWP and CVP. In addition, there are opportunities to improve circulation and, therefore, water quality in the south Delta.
- There are unmet water supply needs, with respect to quantity and reliability of deliveries, south of the Delta for agricultural, M&I, and environmental uses.

Project Objectives/Purpose

DWR and Reclamation have, therefore, identified the following project objectives and purposes:

- reduce the movement of San Joaquin River watershed Central Valley fall-/late fall–run juvenile Chinook salmon into the south Delta via Old River;
- maintain adequate water levels and, through improved circulation, water quality available for agricultural diversions in the south Delta, downstream of the head of Old River; and
- increase water deliveries and delivery reliability to SWP and CVP water contractors south of the Delta and provide opportunities to convey water for fish and wildlife purposes by increasing the maximum permitted level of diversion through the existing intake gates at CCF to 8,500 cfs.

Meeting these objectives by implementing the SDIP will provide increased operational flexibility and the ability to respond to real-time fish conditions while maintaining water delivery reliability.

Background of the Purpose and Need

The following background and historical information provides additional context for understanding the SDIP purpose and need. DWR developed the SDIP project physical/structural and operational components (as analyzed in this EIS/EIR) through many related state and federal efforts to improve Delta water conveyance capabilities and water quality in a manner that takes into consideration multiple beneficial uses of a unique Delta resource. The SDIP project is being pursued to address the needs of the Delta aquatic environment, as well as longstanding regional and local water supply needs. The major factors that have influenced water resources decision-making, uses, and regulatory constraints in the south Delta are presented below.

Ongoing Protection of Fish Resources and Other Environmental Resources

The operations of the SWP and CVP export facilities in the south Delta can cause direct losses of the Central Valley fall-/late fall–run Chinook salmon evolutionarily significant unit (ESU), a candidate for listing under the ESA, and other special-status species. The SWP and CVP exports change preproject flow patterns in several Delta channels, affecting migration habitat conditions. The SWP and CVP Delta export facilities also result in the increased exposure of these fish species to predation. Additional losses occur when fish are entrained

to varying degrees by the SWP and CVP Delta export facilities and other diversions in the Delta and Central Valley rivers.

South Delta Fish Protection

Flows of the San Joaquin River typically divide downstream of Mossdale at the head of Old River, with part of the flow entering Old River. During the 1960s, low levels of dissolved oxygen were observed in the Stockton area and were identified as a source of delay or blockage to the upstream migration of adult San Joaquin River watershed Central Valley fall-/late fall–run Chinook salmon (Hallock 1968). Two measures were identified as needed to improve conditions:

- increased flow through the Stockton area and
- improved sewage treatment.

In response to flow concerns and to improve conditions for salmon, DWR has constructed a temporary fish barrier at the head of Old River near Mossdale each fall since 1968. The barrier is installed and operated April through mid-June and possibly extended to July 1 if warranted, and mid-September through November. In the spring, the barrier is constructed 10 feet high with six culverts to allow only minimal flow and prevent downstream-migrating salmon smolts in the San Joaquin River from entering Old River, which would expose them to SWP and CVP diversion operations and unscreened agricultural diversions. In the fall, the barrier impedes flow from the San Joaquin River entering Old River. This impediment helps maintain adequate dissolved oxygen concentrations for adult salmon migrating upstream (Hayes 1995). The barrier is notched at the top in the fall to allow passage of salmon migrating up Old River to the San Joaquin River.

Environmental Water Account

The Environmental Water Account (EWA) is a cooperative water management program, the purpose of which is to provide protection to at-risk native fish species of the Bay-Delta, while improving water delivery reliability for water users. The EWA actions involve the development and management of alternative sources of water supply, called EWA assets, to address the water delivery reliability of the SWP and CVP and ecosystem quality objectives. The EWA program makes environmentally beneficial changes in the operations of the SWP and the CVP, at no uncompensated water loss to the CVP and SWP water users. Protective actions for at-risk native fish species range from reducing Delta export pumping to augmenting instream flows and Delta outflows.

Beneficial changes in SWP and CVP operations could include changing the timing of some flow releases from storage and the timing of water exports from the Delta pumping plants to coincide with periods of greater or lesser vulnerability of various fish species to environmental conditions in the Delta. For example, the EWA might alter the timing of water diversions from the Delta

and carry out water transfers in order to reduce fish entrainment at the pumps and provide migratory cues for specific anadromous fish species. The EWA program is designed to replace any regular water supply interrupted by the environmentally beneficial changes to SWP and CVP operations beyond the regulatory baseline. The timing of the protective actions and operational changes vary from year to year, depending on many factors such as hydrology and real-time monitoring that indicates fish presence at the pumps. The EWA program obtains its water assets by acquiring, banking, transferring, or borrowing water and then arranging for its conveyance. Water is acquired substantially through voluntary purchases in the water transfer market and by developing additional assets over time. The EWA program also obtains water through operational flexibility of Delta facilities.

The EWA, per the CALFED ROD, was an essential commitment for meeting ESA requirements for the CALFED Program for the first four years (through September 2004). Extension of the EWA required additional environmental documentation. The Draft EIS/EIR was circulated for public review on July 23, 2003. Environmental documentation for this program was completed in March 2004. The EWA EIS/EIR assumes that current EWA actions will be implemented through 2007 (unless significant changes in existing circumstances require additional environmental analysis) and explains the potential for extending the program. Unless renewed by agreement, the EWA will expire on December 31, 2007.

This EWA program reduces the effects of the SWP and CVP current operations on fish. The SDIP analysis assumes that this current EWA program is in place for all alternatives, including the No Action. However, the proposed SDIP could result in impacts on the current EWA. Section 6.1 describes the magnitude of these impacts expected to result from the SDIP. It also describes in detail the mitigation that can be implemented to reduce the impacts on the current EWA program.

In addition, Reclamation, DWR, USFWS, NOAA, and DFG are currently analyzing a Long-Term EWA (LTEWA) program. Should the LTEWA be adopted, it is expected that it would mitigate the operational impacts of SDIP.

Central Valley Project Improvement Act

The CVPIA is a federal statute passed in 1992 with the following purposes:

> To protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California; to address impacts of the CVP on fish, wildlife and associated habitats; to improve the operational flexibility of the CVP; to increase water-related benefits provided by the CVP to the state of California through expanded use of voluntary water transfers and improved water conservation; to contribute to the state of California's interim and long-term efforts to protect the San Francisco Bay/Sacramento–San Joaquin Delta Estuary; to achieve a reasonable balance among competing demands for

use of CVP water, including the requirements of fish and wildlife, agricultural, municipal and industrial and power contractors.

The CVPIA modified the priorities for managing water resources of the CVP, a major link in California's water supply network. CVPIA amended previous authorizations of the CVP to include fish and wildlife protection, and habitat restoration and enhancement as project purposes, having equal priority with agricultural, municipal, and industrial water supply, and power purposes. A major feature of CVPIA is that it requires acquisition of water for protecting, restoring, and enhancing fish and wildlife populations. As a result, CVP contractors experienced a reduction in average annual deliveries from approximately 2 maf to approximately 1.4 maf.

CVPIA Section 3406 (b)(1) authorizes and directs Reclamation to double the natural production of anadromous fish in Central Valley rivers and streams. To meet this goal, USFWS developed the Anadromous Fish Restoration Program (AFRP), which includes recommendations for increasing flows to complement other habitat restoration activities intended to improve conditions for anadromous fish.

Section 3406 (b)(3) of the CVPIA mandates the development of a program that acquires water for 3406 (b)(1) needs to supplement the quantity of water dedicated to fish and wildlife purposes.

CVPIA Section 3406 (b)(2) (CVPIA [b][2]) authorizes and directs the Secretary of the Interior to dedicate and manage 800,000 acre-feet of CVP yield annually for the primary purpose of implementing the fish, wildlife, and habitat restoration purposes and measures authorized in CVPIA, to assist the State of California in its efforts to protect the waters of the Bay-Delta and to help meet obligations legally imposed on the CVP under state or federal law following the date of enactment of the CVPIA. This dedicated 800,000 acre-feet of water, known as (b)(2) water, was included as a component of the Programmatic EIS/EIR existing regulatory baseline for fishery protection conditions for environmental and fisheries protection measures.

Section 3406 (d) mandates that the Secretary of the Interior "shall provide firm water supplies of suitable quality to maintain wetland habitat areas on units of the National Wildlife Refuge System in the Central Valley of California; on the Gray Lodge, Los Banos, Volta, North Grasslands, and Mendota state wildlife management areas; and on the Grasslands Resources Conservation District in the Central Valley of California." The statute also directs Reclamation to meet specific goals for water supplied to these sites within a specified amount of time.

To meet water acquisition needs under CVPIA, DOI has developed a Water Acquisition Program (WAP), a joint effort of Reclamation and the USFWS. The WAP acquires water to meet two purposes: (1) refuge water supplies, and (2) instream flows. CVPIA requires DOI to acquire additional water supplies (known as Level 4) to meet optimal waterfowl habitat management needs at national wildlife refuges in California's Central Valley, certain state wildlife management areas, and the Grasslands Resource Conservation District. The

WAP acquires water from willing sellers to increase instream flows for fish in support of the AFRP.

Vernalis Adaptive Management Plan

The Vernalis Adaptive Management Plan (VAMP) is a 12-year experimental program that stipulates flows on the San Joaquin River and export curtailments at the CVP and SWP for 31 days during the months of April and May. VAMP was included in D-1641 and was in its sixth year in 2005. The purpose of VAMP is to identify the true fall-/late fall–run Chinook salmon smolt and delta smelt populations and survival in the lower San Joaquin River and improve aquatic habitat conditions in the Delta for fall-/late fall–run Chinook salmon and delta smelt. Currently, CVPIA (b)(2) water can be used to reduce exports at the CVP. These export reductions are taken, and (b)(2) water is used to account for the reduction. The EWA can reduce exports at the SWP and CVP as well. If export reductions are taken, the EWA transfers water in the summer to make up for the earlier export reductions. The reductions in exports combined with the pulse flows down the San Joaquin River during VAMP allow larval and juvenile smelt to avoid becoming entrained at the export facilities and to move downstream to Suisun Bay.

Recent Fish Declines in the Delta and Estuary

In the last few years, the abundance indices calculated by the Interagency Ecological Program (IEP) Fall Midwater Trawl survey (MWT) demonstrated significant declines in numerous pelagic fishes in the upper San Francisco Bay-Delta Estuary. The abundance indices for 2002–2004 were measured at record low levels for delta smelt and age-0 striped bass and near-record lows for longfin smelt and threadfin shad (www.delta.dfg.ca.gov). Data from another IEP monitoring survey, the Summer Townet Survey (TNS), corroborate the MWT findings. In contrast, however, the San Francisco Bay Study did not show significant declines in its catches of marine/lower estuary species. Based on these findings, the problem appears to be limited to fish dependent on the upper portion of the Bay-Delta estuary.

While several of the declining species—including Delta smelt, longfin smelt, juvenile striped bass, and calanoid copepods—previously showed evidence of a long-term decline, there appears to have been a precipitous “step-change” to very low abundance during 2002–2004. This observation is supported by initial statistical analyses of the MWT data. Moreover, the record or near-record low abundance levels are surprising in view of the fact that the hydrological regime in the San Francisco Bay-Delta Estuary was relatively moderate (no extreme dry or wet periods) during 2002–2004. Many estuarine organisms, including longfin smelt and striped bass, typically produce poor year classes in dry years (Jassby et al. 1995); delta smelt abundance is generally lowest in very wet or very dry years

(Moyle et al. 1992). Thus, the moderate hydrology during the past 3 years would be expected to produce at least modest population indices.

The current conceptual model for why fish abundance has declined abruptly in recent years assumes at least three general factors that may be acting individually or in combination to lower pelagic productivity: (1) toxins; (2) invasive species; and (3) water project operations. DFG, NOAA Fisheries, and USFWS are assisting with the development of a screening-level study being implemented in summer 2005. The results of this study will be made available in November 2005. It is expected that this study will better define the degree to which each of these factors may be responsible individually, or in combination. The study is designed to identify the most likely causes and to assign priorities on the basis of where funds and resources can be best used. Results also may provide additional information on causes of long-term declines in several affected species. Several of the studies are expected to be conducted based on an "adaptive management" approach, where information is analyzed as it is made available and, depending on the results, supplementary studies are conducted in 2006 and later years.

Scientific studies, such as described above, are needed to determine the cause of the decline in pelagic fish. Until a determination can be made, no specific reason should be assumed at this time. These types of studies will be ongoing and will likely lead to new scientific evidence about the relationships among various species in the Delta. Although design, fabrication, and construction of the gates may begin before these studies are complete, the SWP export limit increase will not be fully implemented until after the gates are constructed and operable (2009). This provides DWR and Reclamation time to sort out the cause of the decline in some pelagic fish in the Delta before substantial pumping due to 8,500 cfs permit changes takes place.

More information regarding the potential causes of the declines and actions to investigate and solve this issue is described in Appendix J.

South Delta Water Agency Water Reliability

South Delta Water Agency (SDWA) members have a need to improve reliability of water diversions to meet consumptive use needs. SDWA is a public agency formed by law to enter into contracts with the United States and the State of California to protect the water rights of landowners within the agency's jurisdiction from salinity intrusion and to ensure a dependable water supply. Water for lands within SDWA boundaries is supplied almost exclusively from Delta channels. Water supply in the south Delta is dependent on water quality and levels, which are influenced by a variety of factors, including natural tidal fluctuation; San Joaquin River inflow; local diversions; local agricultural return flows; channel capacity resulting in restricted circulation; fluctuations in barometric pressure; local wind direction and velocity; and water exports.

In July 1982, SDWA filed a lawsuit over the effects of SWP and CVP operations on the south Delta. The suit sought a declaration of the rights of the parties as

well as preliminary and permanent injunctions requiring that the projects be operated to protect the south Delta. SDWA alleged that: (1) CVP operations on the San Joaquin River, primarily Friant Dam, unlawfully reduce the quantity and degrade the quality of water flowing in the San Joaquin River to the south Delta; (2) SWP and CVP pumping operations violate SDWA rights by lowering water levels, reversing flows, and diminishing the influence of the tides; and (3) the Secretary of the DOI's designation of the Stanislaus River basin for allocation of water from New Melones Reservoir violates SDWA rights by not including the south Delta in the basin.

DWR's involvement in the suit is a result of the alleged effects of the SWP and CVP pumps on south Delta water levels and circulation. The other issues involve only Reclamation.

Tom Paine Slough Modifications

In May 1984, SDWA complained of low water levels in Tom Paine Slough. DWR responded by installing three water level recorders on Tom Paine Slough: one below the tidal control structure, one above the structure, and one near the southern end of the slough.

In March 1985, SDWA again complained about low water levels, claiming difficulty in getting sufficient water into Tom Paine Slough to meet irrigation needs. In response, DWR made soundings along the slough and found high spots in the channel bottom above and below the tidal control structure. DWR repaired the gates, which were functioning improperly, and removed a small amount of sediment from around the control structure. However, in July 1985, SDWA claimed that water levels in both Tom Paine Slough and southern Middle River were so low that adequate irrigation was impossible and crops were being lost. Emergency efforts concentrated on Tom Paine Slough, where DWR installed three portable pumps to provide water supply. Also, CCF gate operation was modified to improve water levels in channels.

In September 1985, DWR signed a letter of intent with SDWA describing conditions in south Delta channels and setting forth the agencies' responsibilities to develop a permanent solution for the water level and circulation concerns affecting SDWA.

Joint Powers Agreement

In June 1986, DWR signed a joint powers agreement with SDWA regarding interim mitigation in SDWA channels. This agreement provided for dredging Tom Paine Slough (completed in October 1986), constructing a seasonal low rock weir in Middle River (installed most years since May 1987), constructing siphons in Tom Paine Slough (completed in June 1989), and developing intake gate operation criteria for CCF that eliminate diversions during the low-low tide.

All appropriate permits and certifications required under regulatory and legislative acts were acquired.

South Delta Temporary Barriers Program

The barrier testing program, referred to as the South Delta Temporary Barriers Program, was initiated in 1991. Its objectives are the short-term improvement of water conditions for the south Delta and the development of data for the design of permanent gates. The program involves the seasonal installation of four barriers. Since 1991, DWR has seasonally installed three barriers—one each on Middle River, Grant Line Canal, and Old River—to provide adequate quantity and quality for SDWA water users. The barriers are a combination of rock placed into the main channel bed at each location along with overflow weirs and several gated culverts. These barriers are installed in the spring and removed in the fall. The fourth barrier, a fish control barrier at the head of Old River, is discussed below under South Delta Fish Protection. While it is unrelated to the SDWA lawsuit, it has become part of the Temporary Barriers Program for purposes of coordinating construction and permitting activities. The Temporary Barriers Program continues to be implemented on an annual basis as an interim solution to water levels and circulation until a permanent solution can be implemented. Several state and federal permits have been issued for the Temporary Barriers Program. These permits are valid through 2007, with the exception of the 1601 permit issued by the DFG, which expires in November 2005. All necessary permits will be renewed to extend the program until a permanent solution, such as SDIP, is implemented.

Mismatch between Supplies and Beneficial Uses

The Bay-Delta system provides the water supply for a wide range of instream, riparian, and other beneficial uses such as drinking water for millions of Californians and irrigation water for one-third of California's agricultural land. Some of these beneficial uses depend on the Bay-Delta system for only a portion of their water needs while others are highly or totally dependent on Bay-Delta water supplies. As water use and competition among uses have increased during the past several decades, conflicts have increased among users of Bay-Delta water. Heightened competition for the water during certain seasons or during water-short years has magnified the conflicts. As a result, demands for reliable water supplies south of the Delta continue to increase (CALFED Bay-Delta Program 2000).

Further compounding the issue, water flow and timing requirements have been established for certain fish and wildlife species with critical life stages that depend on freshwater flows. These requirements have reduced water supplies and flexibility to meet the quantity and timing of water delivered from the Bay-Delta system. Water suppliers and users are concerned that additional restrictions that may be needed to protect species would increase the uncertainty

and further reduce the availability of the Bay-Delta system for agricultural and M&I purposes (CALFED Bay-Delta Program 2000b).

Currently, the amount of water available for M&I, agriculture, and environmental use in any given year depends on rainfall, snow pack, runoff, carryover storage, pumping capacity from the Delta, regulatory constraints, and the amount requested. In average years, such as 2000, California receives close to 200 million acre-feet (maf) of water from precipitation and imports. Of this total supply, about 50 to 60% is used by native vegetation, evaporates into the atmosphere, provides some water for agricultural crops and managed wetlands, or flows to Oregon, Nevada, the Pacific Ocean, and salt sinks like saline groundwater aquifers and the Salton Sea. The remaining 40 to 50%, called the dedicated or developed supply, is distributed among urban and agricultural uses, water for protecting and restoring the environment, or storage in surface and groundwater reservoirs for later use. In any year, some of the dedicated supply includes water that is used multiple times (reuse) and water held in storage from previous years. Ultimately, about a third of the dedicated supply flows out to the Pacific Ocean or to other salt sinks, in part to meet environmental water requirements for designated Wild and Scenic Rivers. (California Department of Water Resources 2005.)

Bulletin 160-98, a report issued by DWR, provides background and forecast information regarding water supply in California. This bulletin estimates the available water supply under both 1995 level of demand and 2020 level of demand with existing facilities and programs, and also presents shortages based on estimated supply and demand. Table 1-2 shows the estimated water use and supplies under the 1995 and 2020 levels of demand, and the resulting shortages.

Table 1-2. California Water Budget with Existing Facilities and Programs (maf)

	1995		2020	
	Average	Drought	Average	Drought
Water Use				
Municipal and Industrial	8.8	9.0	12.0	12.4
Agricultural	33.8	34.5	31.5	32.3
Environmental	36.9	21.2	37.0	21.3
Total	**79.5**	**64.7**	**80.5**	**66.0**
Supplies				
Surface Water	65.1	43.5	65.0	43.4
Groundwater	12.5	15.8	12.7	16.0
Recycled and Desalted	0.3	0.3	0.4	0.4
Total	**77.9**	**59.6**	**78.1**	**59.8**
Shortage	**1.6**	**5.1**	**2.4**	**6.2**

maf = million acre-feet.

A public review draft of the 2005 Update for Bulletin 160-98 was made available in April 2005. The 2005 Update evaluates scenarios for three water year types, represented by the years 1998 (Wet Year), 2000 (Average Year), and 2001 (Dry Year). Table 1-3 summarizes the total supply and distribution of the dedicated supply to various uses within California for the three years evaluated. (California Department of Water Resources 2005.)

Table 1-3. California Water Balance Summary for Water Years 1998, 2000, and 2001

	1998 (Wet Year)	2000 (Average Year)	2001 (Drier Year)
Total Supply (Precipitation and Imports)	336.9 maf	194.7 maf	145.5 maf
Dedicated Supply (Includes Reuse)	94.5 maf	82.5 maf	64.7 maf
Distribution of Dedicated Supply to Various Applied Water Uses			
Urban Uses	7.8 maf	8.9 maf	8.6 maf
Agricultural Uses	27.3 maf	34.2 maf	33.7 maf
Environmental Water*	59.4 maf	39.4 maf	22.5 maf

* Environmental water includes instream flows, wild and scenic flows, required Delta outflow, and managed wetlands water use.

Source: California Department of Water Resources Public Review Draft Water Plan Update 2005, Volume 3.

To balance the needs of all beneficial users as well as the needs of the environment, CALFED agencies analyzed four different alternatives, all of which included differing operational and structural components for the SWP and CVP facilities (as well as other water conservation efforts, transfers, etc.) to reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system.

The SDIP project is one component identified in the CALFED Programmatic Preferred Alternative that will enable the CALFED preferred alternative goals to be met. Increasing the permitted diversion capability at the SWP's CCF from the current 6,680 cfs to 8,500 cfs to allow an increase in pumping at SWP Banks would improve water export supplies during periods when there are fewer criteria for environmental needs controlling Delta flows and exports. As a result, reductions in exports could be made during times when those criteria are in effect. On balance, this would provide SWP and CVP more flexibility and therefore improve predictability of water supply from the Bay-Delta system for beneficial use needs.

State Water Project

DWR operates and maintains the SWP, which delivers water to 29 agricultural and M&I contractors in the northern California, San Joaquin Valley, the San Francisco Bay Area, and central coast and southern California. The SWP delivers water for agricultural, municipal, and industrial uses, providing water to 20 million Californians and 660,000 acres of irrigated farmland. It comprises 20 pumping plants, five hydroelectric power plants, 33 storage facilities, and more than 660 miles of aqueducts and pipelines. These facilities include its major diversion and pumping facility (CCF and SWP Banks) in the south Delta, and the California Aqueduct extending from the south Delta to SWP facilities in southern California.

The SWP began its deliveries in the 1960s, during a time when environmental concerns began to shape legislation. Throughout the 1970s, regulations intending to protect, conserve, and restore environmental resources were enacted. These laws, in turn, have shaped the way DWR manages and operates SWP facilities. Freshwater releases are made from upstream reservoirs, pumping operations are scheduled to minimize impacts on fish, programs were established and facilities were built to protect fish and wildlife.

Twenty-nine water agencies (contractors), of which The Metropolitan Water District of Southern California (Metropolitan) is the largest, contract with DWR for project water. The amount of each contract is specified in "Table A." Table A amounts are used to define each contractor's proportion of the available water supply that DWR will allocate and deliver to that contractor. Each year, contractors may request an amount not to exceed their Table A amount. The Table A amounts are used as a basis for allocations to contractors, and the actual supply to contractors is variable and depends on the amount of water available. The total Table A contract amount is 4.2 maf a year. Approximately 3 maf of the Table A amount is provided each year. Under the terms of the SWP's $1.75 billion bond issue, users for the most part pay all costs of the project, including interest. SWP contractors also pay energy costs and a transmission charge based on the distance the water is transported. Although SWP water is more expensive than federal water, it is not subject to an acreage limit.

The Monterey Agreement signed by 26 of 29 SWP water contractors in 1994 restructured SWP contracts to allocate water based on contractual Table A amounts instead of the amount of water requested for the given year. In times of shortages, the SWP agricultural and M&I contractors will be cut equally. Typically, however, water-delivery capabilities are lower than Table A amounts.

The SWP operates under long-term contracts with public water agencies throughout the state extending from Sutter, Butte, and Plumas Counties in the north to Alameda, Santa Clara, and Napa in the Bay area, through the San Joaquin Valley and San Luis Obispo and Santa Barbara Counties, and finally to southern California. These agencies, in turn, deliver water to wholesalers or retailers or deliver it directly to agricultural and M&I water users (California Department of Water Resources 1999a). There are five divisions within the

SWP: Oroville, Delta, San Luis, San Joaquin, and Southern Field Divisions. Each division within the SWP contains several facilities including dams, pumping plants, canals, power plants, lakes, and reservoirs. Service areas for SWP contracting agencies are shown in Figure 1-1 and region, contractors, and full Table A amounts in 2003 are outlined in Table 1-4.

SWP supplies water to the northern Delta and Napa and Solano Counties from water stored in Oroville Reservoir and distributed through the North Bay Aqueduct. The Bethany Reservoir is fed by the SWP Banks facility in the southern Delta. Water supplies from this reservoir are distributed via the South Bay Aqueduct to Alameda and Santa Clara Counties.

The SWP distributes water to southern areas of California through the California Aqueduct and the Coastal Branch Aqueduct, built and operated by DWR. The Coastal Branch is an extension of the California Aqueduct that serves San Luis Obispo and Santa Barbara Counties. The California Aqueduct eventually feeds the Edmonston Pumping Plant and water is pumped over the Tehachapi Mountain range into the Antelope Valley. At this point the aqueduct branches into what is called the East Branch and the West Branch. The East Branch carries water through Antelope Valley and the San Bernardino Mountains, and terminates at Lake Perris near the city of Riverside. This branch conveys water to the east side of San Bernardino County. The West Branch carries water from the Tehachapi Afterbay and terminates in Pyramid Lake, serving Los Angeles County. (California Department of Water Resources 1999a.) Energy required to pump and distribute SWP water to its users comes from sources such as hydroelectric power by operating nine hydroelectric power plants. Other sources are energy exchange and purchase from other utilities.

Table 1-4. 2003 State Water Project Table A Contract Amounts

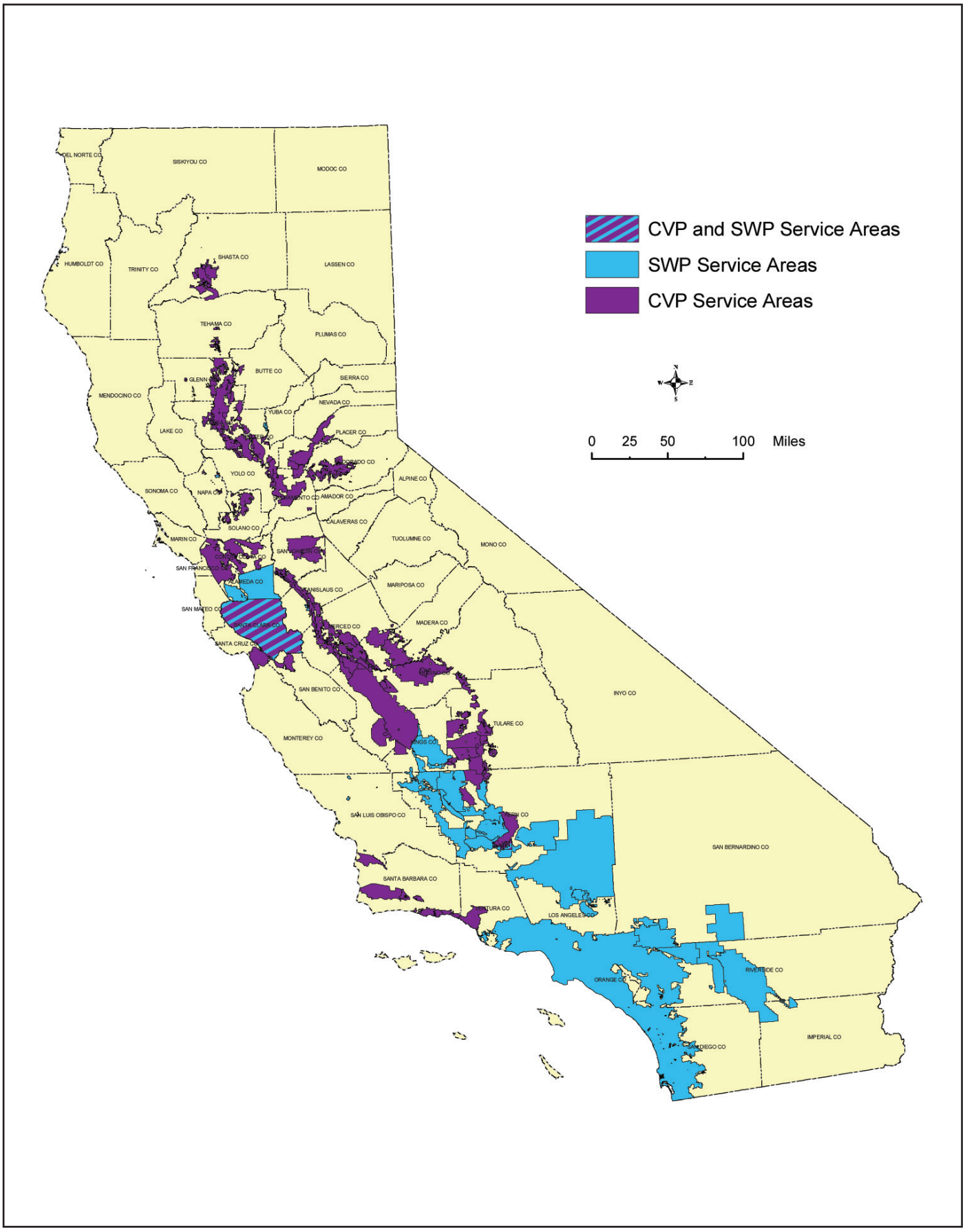
Region	Contractor	Contract Amounts in 2003 (acre-feet)
North Bay Area	Napa County FC & WCD	29,025
	Solano County Water Agency	47,756
	Total	**76,781**
South Bay Area	Alameda County FC & WCD	78,000
	Alameda County Water District	42,000
	Santa Clara Valley Water District	100,000
	Total	**220,000**
Central Coast Area	San Luis Obispo County FC & WCD	25,000
	Santa Barbara County FC & WCD	45,486
	Total	**70,486**

Region	Contractor	Contract Amounts in 2003 (acre-feet)
San Joaquin Valley Area	Dudley Ridge Water District	57,343
	Empire West Side Irrigation District	3,000
	Kern County Water Agency	1,000,949
	County of Kings	4,000
	Oak Flat Water District	5,700
	Tulare Lake Basin Water Storage District	111,527
	Total	**1,182,519**
Southern California Area	Antelope Valley–East Kern Water Agency	141,400
	Castaic Lake Water Agency	95,200
	Coachella Valley Water District	23,100
	Crestline–Lake Arrowhead Water Agency	5,800
	Desert Water Agency	38,100
	Little Rock Creek Irrigation District	2,300
	Mojave Water Agency	75,800
	Palmdale Water District	21,300
	San Bernardino Valley Municipal Water District	102,600
	San Gabriel Valley Municipal Water District	28,800
	San Gorgonio Pass Water Agency	17,300
	Metropolitan Water District of Southern California	2,011,500
	Ventura County Flood Control District	20,000
	Total	**2,583,200**
Feather River Area	City of Yuba City	9,600
	County of Butte	27,500
	Plumas County FC & WCD	2,700
	Total	**39,800**
State Water Project Total		**4,172,786**

FC & WCD = Flood Control and Water Conservation District.

Central Valley Project

Reclamation operates and maintains the CVP, which delivers approximately 1.4 maf of water each year, on average, to south-of-Delta water contractors (Bureau of Reclamation 2003a). The CVP was federally authorized in the 1935 Rivers and Harbors Act, and construction began in the late 1930s. Development of the CVP was motivated initially by a fear of floods and drought and a desire to transport water from the Sacramento River in the northern portion of the Central Valley to the drier southern portion. Since then, reauthorizations have directed Reclamation to operate the CVP to meet various goals. As a result, the CVP currently supplies irrigation water to the Sacramento and San Joaquin Valleys, to



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Jones & Stokes

Figure 1-1
State Water Project (SWP) and
Central Valley Project (CVP) Service Areas

cities and industries in Sacramento and the east and south Bay Areas, and to fish hatcheries and refuges throughout the Central Valley.

The CVP divisions are the American River, Delta, East Side, Friant, Sacramento River, San Felipe, Shasta, Trinity River, and West San Joaquin River Divisions. Each division within the CVP contains several facilities, including dams, pumping plants, canals, power plants, and reservoirs.

The CVP comprises 20 dams and reservoirs, 39 pumping plants, two pumping-generating plants, 11 power plants and 500 miles of major canals, conduits, and tunnels. North-of-Delta facilities include those associated with Shasta, Folsom, and Trinity Dams and the Sacramento and American Rivers. Major facilities in the south Delta include the CVP Tracy facility, which conveys water to the Delta-Mendota Canal (DMC).

The CVP supplies water for one-third of the agricultural land in the state, about 5 million acres, and to help meet the needs of 1 million households throughout the state. Statewide, deliveries total approximately 7 maf as follows: agricultural (6.2 maf), M&I (0.5 maf) (California Department of Water Resources 1998a), and wildlife refuge use (0.47 maf) (Bureau of Reclamation 2003). The CVP exports up to 2.5 maf through the Tracy Pumping Plant. Service areas for CVP contracting agencies are shown in Figure 1-1. Allocations to CVP contractor divisions vary from year to year. Allocation amounts for 2002 are shown in Table 1-5.

Table 1-5. Central Valley Project Maximum Contract Amounts (acre-feet)

Division	Maximum Contract Quantity
American River Division	420,750
Delta Division	576,487
East Side Division	155,000
Friant Division	2,201,475
Sacramento River Division	783,230
San Felipe Division	196,300
Shasta Division	14,172
Trinity River Division	40,878
West San Joaquin Division	1,395,670
Refuge Contracts	600,315
Miscellaneous	176,300
Central Valley Project Total	6,560,568

Operations Criteria and Plan

The Central Valley Project Operations Criteria and Plan (OCAP) describes the regulatory and physical constraints and conditions under which the CVP and SWP currently operate. Given the coordinated operation of the CVP with the SWP, OCAP also describes the operation of the SWP. The descriptions of the CVP and SWP in the OCAP are the basis for the biological opinions that authorize take of endangered species. The OCAP also explains the methods of determination for the current operating procedures for both the SWP and the CVP. The documentation and analysis of operations contained in OCAP were intended to provide the basis for entering Section 7 ESA consultation with NOAA Fisheries and USFWS.

OCAP describes the benefits from and the objectives of each CVP division. These benefits/objectives cover such topics as recreation, water supply, power generation and supply, water storage, flood control, fishery enhancement, and water quality. Objectives assist Reclamation in determining the management strategies for each division of the CVP. OCAP also discusses operation of major facilities relied upon by SWP and CVP, such as CCF for joint operations at SWP Banks and San Luis Reservoir.

Reclamation and DWR coordinate operations of the CVP and SWP facilities to meet water quality requirements under the 1986 COA (described below). The OCAP includes these coordinated operations as part of the project descriptions. Therefore, changes in pumping operations in either project must be consistent with OCAP to be covered by permits and biological opinions obtained in reliance on operations described in OCAP.

Changes in California's Water Management Framework

The changes in California's water management framework include changed regulatory and institutional conditions, construction of new water supply facilities and changes to existing facilities, and legislative changes; examples are listed in Table 1-6 below. In 2000, DWR and Reclamation conducted a joint modeling effort to estimate changes in SWP and CVP deliveries resulting from changes in regulatory conditions since the last drought. The analysis was based on the 1983–1993 hydrologic period, which includes wet years and the 1987–1992 drought. The overall results indicated an average annual reduction in total SWP and CVP deliveries of 900,000 acre-feet over the 1983–1993 period. During the drought, there was a reduction of 1,200,000 acre-feet in average annual deliveries. The largest single year impact was a total delivery reduction of 1,800,000 acre-feet to SWP and CVP water contractors.

Table 1-6. Recent Actions Affecting California Water Supplies

Action	Year	Description
State Water Board Orders WR 90-05 and WR 91-01	1990 and 1991	Water rights orders that modified Reclamation water rights to incorporate temperature control objectives in Upper Sacramento River.
NOAA Fisheries Biological Opinion for Winter-Run Chinook Salmon	1992, 1993, and 1995	Established operation under the Reasonable Prudent Alternative (RPA) for 1992 operations to protect winter-run Chinook salmon and Central Valley steelhead. Provided for incidental take within the RPA.
Public Law 102-575, Title 34	1992	Mandates changes in management of the CVP, particularly for the protection, restoration, and enhancement of fish and wildlife.
USFWS Biological Opinion for Delta Smelt and Sacramento Splittail	1993, 1994, and 1995	Established operational criteria to protect delta smelt.
State Water Board Decision 1631	1994	Modified Los Angeles Department of Water and Power water rights to divert water from tributaries to Mono Lake.
Bay-Delta Plan Accord and State Water Board Order WR 95-06	1994 and 1995	Agreement and associated State Water Board order to provide for operations of the CVP and SWP to protect Bay-Delta water quality. Also provided for further evaluation of Bay-Delta operations, which is being pursued under the CALFED process.
Monterey Agreement and Amendments	1995	Agreement between DWR and SWP contractors to revise water supply allocation and management under the SWP water supply contracts.
NOAA Fisheries Biological Opinions	1996 and 1997	Established criteria to protect coho salmon and steelhead in coastal streams.
NOAA Fisheries ESA listing	1999	Spring-run Chinook listing.
State Water Board Revised WR Decision 1641	2000	Revised order to provide for the operations of the CVP and SWP to protect Bay-Delta water quality.
Trinity ROD and related decisions	2001 and 2004	Restored flows on the Trinity River. The ROD was upheld by the Federal Court in 2004.
NOAA Fisheries Biological Opinion for salmonids	2004	NOAA Fisheries issued a BO stating a finding of no jeopardy on the effects of the system-wide CVP/SWP operations (OCAP).
USFWS Biological Opinion for Delta smelt	2004 and 2005	USFWS issued a BO stating a finding of no jeopardy on the effects of the system-wide CVP/SWP operations (OCAP).

BO = biological opinion.
CVP = Central Valley Project
ESA = federal Endangered Species Act.
NOAA Fisheries = National Marine Fisheries Service.
ROD = Record of Decision.
SWP = State Water Project.
State Water Board = State Water Resources Control Board.
USFWS = U.S. Fish and Wildlife Service.
WR = water right.

Source: California Department of Water Resources, unpublished.

The Monterey Agreement and Amendments to State Water Project Contracts

When the SWP began operations in the 1960s, DWR signed contracts with water contractors throughout the state to manage the allocation of the water. The contracts set forth the conditions and regulations that were to be followed in both wet years and critical years. Article 18 addresses the allocation of shortages in water supply, and particularly under what circumstances the initial reductions to agricultural use should be imposed prior to reducing allocations to urban contractors. Article 18(a) deals with temporary shortages that occur due to droughts and other temporary causes. Article 18(b) deals with the possibility of specified types of permanent shortages of supply of project water. In the droughts of 1987–1992, water supply was severely reduced, and as a result, Article 18(a) became the center of SWP allocation controversy.
The agricultural diverters, who sustained the most drastic cuts during the drought, argued that such cuts were not equitable and that the shortage was a result of both undeveloped SWP project allocations and hydrological events. Because M&I contractors did not face the same supply reduction, they held different opinions about the implementation of Article 18. As disagreement persisted with the growing water shortage, DWR and SWP contractors entered into discussions and negotiations to resolve the problem.

These discussions were threatening to enter legislative and judicial arenas, so DWR initiated a fulltime effort to resolve the problems by hiring a mediator in October and November and setting a deadline of December 1, 1994. With the mediator, the group of contractors and DWR found that the issue of water shortage could not be resolved through negotiations, but rather their contracts, specifically Article 18, needed amendment and modification. They felt that amended contracts would allow greater flexibility in water deliveries and would make the SWP and the DWR more responsive to changing water supply and needs.

When the 2-month period with the mediator had ended, the SWP contractors and the DWR had come to an agreement. Because these discussions were held in Monterey, the result became known as the Monterey Agreement. It consisted of several principles, from which amendments to contracts would form. The principles were developed to satisfy the following goals:

- Goal 1—Increase reliability of existing water supplies;
- Goal 2—Provide stronger financial management; and
- Goal 3—Increase water management flexibility, providing more tools to local water agencies to maximize existing facilities.

Based on these goals and principles, several SWP contracts were amended. The benefits were designed to increase contractor certainty about allocations and facilities use. The agreement also allows contractors to increase their own supply outside of SWP contracts through:

- water transfers,
- water banking,
- storage outside service areas,
- transport of nonproject water,
- permanent sales of water among contractors,
- annual turn-back program,
- use of Kern Water Bank property by agricultural contractors for water banking, and
- access by M&I water contractors to Kern Water Bank.

The Planning and Conservation League (PCL) filed a lawsuit on December 27, 1995, against DWR and Central Coast Water Authority (CCWA), challenging compliance under CEQA for the Monterey Amendment and the transfer of Kern Water Bank (KWB) to Kern County Water Agency (KCWA). The Sacramento County Superior Court ruled in favor of DWR and CCWA, and PCL appealed the decision. The Court of Appeal held that the EIR was inadequate and that DWR should have acted as the lead agency for the project. In addition, the Court reinstated the validation claim in the complaint, providing a forum for review of the entire Monterey Amendment, including the transfer of a portion of the KWB. The Court also directed DWR to prepare a new EIR. In July 2000, the parties reached an agreement on principles for settling the lawsuit. DWR commenced preparing a new EIR and the interested parties continued mediation to prepare a Settlement Agreement. The Superior Court approved the Settlement Agreement on May 20, 2003. Implementation of the Settlement Agreement and preparation of the new EIR are underway.

State Water Resources Control Board Water Quality Control Plan and Decision 1641

The State Water Board issued D-1641 on December 29, 1999, revised March 15, 2000 (State Water Resources Control Board 1999). D-1641 is the water rights decision implementing the 1995 Delta Water Quality Control Plan (WQCP) objectives, including the water quality standards on the San Joaquin and Mokelumne Rivers and Cache and Putah Creeks. D-1641 also approved a petition to change points of diversion of the CVP and SWP in the southern Delta and approved a petition to change places and purposes of use of the CVP. The final phase of implementation focused on how water right holders in the Sacramento Valley should contribute to meeting the 1995 Delta WQCP objectives. A negotiated settlement resolved this issue by creating the Sacramento Valley Water Management Agreement (SVWMA) and Program. D-1641 applies to DWR and Reclamation water rights permits through terms and conditions affecting SWP and CVP operations.

The State Water Board adopted its WQCP for the Bay-Delta and incorporated several elements of U.S. Environmental Protection Agency (EPA), NOAA Fisheries, and USFWS regulatory objectives for water salinity and endangered species protection. The WQCP identifies the beneficial uses of the Bay-Delta that are to be protected and includes water quality objectives that are intended to protect those beneficial uses. The plan also includes an implementation program for achieving the water quality objectives. Under the CWA, the water quality standards comprise the uses and the objectives established to protect them. Features of the current WQCP implemented by D-1641 affect the SDIP by requiring certain Delta outflows and by regulating actions that may be used to protect fish and benefit the environment. Requirements of D-1641 that are relevant to SDIP are:

- water-year classifications that affect outflow requirements and, consequently, export limitations;
- water quality/salinity standards for protection of agricultural and M&I uses;
- the Delta outflow requirements for flow from the Delta to San Francisco Bay; and
- limitations on combined SWP and CVP Delta exports. Sufficient Delta outflow is provided based on available water. Exports (diversion of water from its natural course to San Francisco Bay) are limited to a percentage of the Delta inflow (that does not include rainfall). These percentages range from 35% to 45% from February through June, depending on the Delta inflow, and 65% during the remainder of the year.

Coordinated Operations Agreement

Recognizing the connection between their two major water projects and the need to jointly comply with a combination of federal, state, and regional laws, policies, agency decisions, permit requirements, and agreements relating to water rights and biological resource protection, in 1986 DWR and Reclamation entered into a COA to manage California's water through the operations of their respective SWP and CVP water projects (see descriptions of the SWP and CVP below). Through this agreement and program, DWR and Reclamation coordinate the operations of the SWP and CVP to meet Delta regulatory requirements under D-1641 and the ESA.

The COA replaced earlier similar agreements between the United States and the State of California. The COA specifies how the SWP and CVP operate to meet SWP and CVP requirements described in the 1986 WQCP and under D-1485 (predecessor to D-1641) without adversely affecting the rights of other parties. The COA identifies two types of conditions in the Delta under which the SWP and CVP should operate: *balanced water conditions* and *excess water conditions*.

Balanced water conditions occur when releases from upstream reservoirs plus unregulated flow equal the water supply needed to meet Sacramento Valley in-

basin uses plus exports. During balanced water conditions, but when water is available to be stored in reservoirs, storage releases required to meet the Sacramento in-basin uses are made 55% from the CVP and 45% from the SWP. Under this condition, flow through the Delta is deemed adequate to meet all needs, and the CVP and SWP are operated to store and export as much water as possible up to the physical and contractual limits. Excess water conditions occur when the Delta inflows (combined releases from upstream reservoirs and unregulated flow) are greater than needed to meet the in-basin uses plus export. Under this condition, flow through the Delta is adequate to meet all needs, and no coordinated operation between the CVP and SWP is required.

The COA does not cover all circumstances that occur in Delta operations or all regulatory requirements (e.g., water quality requirements in the 1995 Delta WQCP and stipulations of biological opinions, the EWA, and others). DWR and Reclamation are able to make real time adjustments to the COA accounting to accommodate for theses changes in operational and regulatory requirements.

Issues of Known Controversy

NEPA requires that project proponents identify issues of known controversy that have been raised in the scoping process and throughout the development of the project. DWR and Reclamation considered these concerns in the development of the SDIP. All significant environmental impacts resulting from constructing and operating the SDIP will be mitigated. The following list outlines those issues that have been identified by agencies and the public relative to SDIP.

Effects on Delta Aquatic Resources

The effects on fish and the bay tidal system as a result of water project operations are an issue of concern to the public and government agencies. Recent data indicate that there has been a decline in abundance of pelagic fish species (as described above). Details regarding this information are provided in Appendix J.

DWR and Reclamation are working with other resource agencies to help determine the reasons for the apparent decline of pelagic fish species. In 2005, DWR and Reclamation are redirecting resources to evaluate the potential causes of this decline including toxics, invasive species, and water project operations. The Stage 2 decision will not be made until this information is collected and evaluated. The results of this evaluation will be used to determine and direct additional studies and actions. Therefore, no increase in diversions at CCF beyond that currently permitted will occur due to SDIP implementation until the effects that additional exports may have on this issue are more clearly understood.

Effects on Business in the Delta

There are concerns that the proposed SDIP permanent gates will deter recreation away from the south Delta area. Recreational boating and fishing marinas and related businesses could be affected.

DWR is currently working directly with marinas that may be affected by the permanent gates and is coordinating with the Delta Protection Commission to identify potential in-delta recreation enhancements.

Effects on Water Quality in the South Delta

With the increase in development around the south Delta area combined with increased diversion up to 8,500 cfs, it is possible that water quality may be adversely affected. Also, increased flow may lead to higher rates of sedimentation.

Operating the flow control and fish control gates as proposed will likely result in benefits to water quality. Additionally, DWR has assisted in the development of the Old River and Rock Slough Water Quality Improvements Project, which is also expected to improve water quality for in-Delta users. DWR and Reclamation are committed to working with local agencies through the DIP and the CALFED program to ensure water quality is maintained.

Effects on South Delta Water Users

Current water users in the south Delta have expressed concerns that the increased diversion will adversely affect their ability to divert and the quality of their water. Operation of the permanent gates is expected to maintain adequate water quality and quantity for uses in the south Delta.

DWR is developing an agreement with south Delta water users that will provide additional assurance that their needs will be protected under full implementation of the selected SDIP operational component. The agreement will address adding features to the design of the permanent operable gates that will allow the easy installation of low head pumps. Low head pumps would only be installed if DWR determines in the future that such pumps are needed to meet the purposes of SDIP, appropriate permits and environmental reviews are completed in consultation with the State and federal fishery agencies, and funding is available.

Soil Contamination

The placement of dredged materials could lead to contamination of soils and groundwater if the dredged materials contain toxic substances such as mercury.

DWR will monitor the quality of material dredged from the delta channels. Dredged material will be disposed of in a manner to ensure that soils and groundwater contamination is avoided.

Effects on Other Waterways

The south Delta is connected to several sloughs and “dead-end” channels where water quality is directly related to flow. One concern is that increased diversion at the CCF may lead to further degradation of water quality in the Stockton Deep Water Ship Channel (DWSC).

DWR has quantified the effects of various SDIP alternatives on flow that may affect dissolved oxygen in the Stockton DWSC (see Section 5.3).

Growth-Inducing Effects

One of the SDIP objectives is to increase water deliveries and delivery reliability to SWP and CVP contractors south of the Delta. Increasing the reliability of water may allow additional growth within the south Delta or in exporter areas. The small increase in the amount of water delivered as a result of implementing SDIP is not expected to cause a substantial increase in growth.

Organization and Use of the EIS/EIR

This EIS/EIR is organized in the following sections:

- Chapter 1, "Introduction"—This chapter introduces DWR and Reclamation as CEQA and NEPA lead agencies, describes the purpose and need for the project, and presents background information needed to understand the project purpose and need.
- Chapter 2, "Project Description"—This chapter presents a description of the Project Components, a summary of the alternatives screening process, and physical and operational characteristics of the project alternatives.
- Chapter 3, "Overview of Impact Analysis Approach"—This chapter describes the various methods used in this EIS/EIR to assess environmental impacts as a result of the alternatives.
- Chapter 4, "Summary Comparison of Environmental Consequences"—This chapter summarizes the environmental consequences arising from each alternative and presents a comprehensive view of their similarities and differences.
- Chapter 5, "Physical Environment"—This chapter contains environmental assessments for each alternative of water supply; water quality; hydrodynamics and hydraulics; geology, seismicity, and soils; flood control and levee stability; sediment transport; groundwater resources; transportation and navigation; air quality; and noise.
- Chapter 6, "Biological Environment"—This chapter describes the impacts on fisheries, vegetation and wetlands, and wildlife as a result of the proposed alternatives.
- Chapter 7, "Land and Water Use, Social Issues, and Economics"—This chapter describes impacts on land and water use; social issues and economics; utilities and public services; recreation resources; power production and energy; visual and aesthetic resources; cultural resources; public health and environmental hazards; environmental justice; and Indian trust assets as a result of each alternative.
- Chapter 8, "Compliance with Applicable Laws, Policies, Plans, and Regulatory Framework"—This chapter lists and describes the regulations and constraints affecting the proposed project.

- Chapter 9, "Growth-Inducing Impacts"—This chapter describes the potential for the project and its alternatives to promote growth in the south Delta region and throughout California.
- Chapter 10, "Cumulative Impacts"—This chapter discusses potential and existing projects that, together with the SDIP, may have a compounding impact on similar resources.
- Chapter 11, "Public And Agency Involvement"—This chapter describes the participation of the public and state, federal, and local agencies in determining the alternatives issues that needed to be addressed in this EIS/EIR.
- Chapter 12, "List of Preparers"—This chapter lists the contributors to this document, including those who wrote and reviewed sections and composed graphics.
- Chapter 13, "References"—This chapter contains references for the information presented in this EIS/EIR.