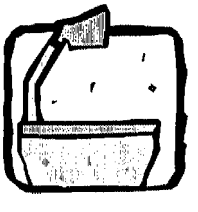
Chapter 1. Program Description

The Bay-Delta estuary is the largest estuary on the West Coast and is the hub of California's water supply system. For decades, conflicting demands on the system have resulted in threats to Bay-Delta resources, including a declining ecosystem with some species threatened with extinction, degradation of water quality, and reduced levee system stability. The initial steps of how the CALFED Bay-Delta Program intends to alleviate the problems in the Bay-Delta are outlined in this chapter.



1. Program Description

1.1 PROGRAM DESCRIPTION

1.1.1 BACKGROUND

A maze of tributaries, sloughs, and islands, the San Francisco Bay/Sacramento-San Joaquin Delta estuary (Bay-Delta) is the largest estuary on the West Coast of the United States. It is a haven for plants, fish, and wildlife, supporting over 750 plant and animal species. In addition to native species, a number of species have been introduced either purposefully (striped bass) or accidentally (Chinese mitten crab). The Bay-Delta includes over 738,000 acres in five counties. The Bay-Delta is critical to California's economy, supplying drinking water for two-thirds of Californians and irrigation water for over 7 million acres of the most highly productive agricultural land in the world. The location of the Sacramento-San Joaquin Delta is shown in Figure 1-1.

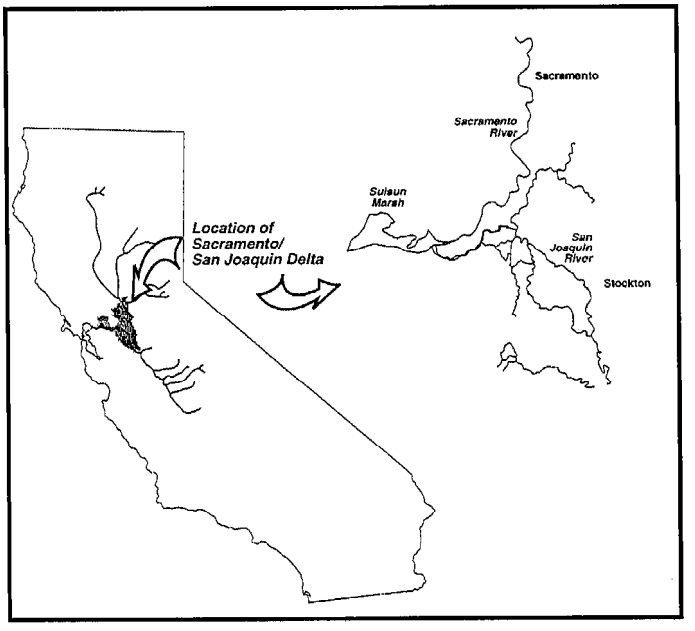


Figure 1-1. Location of the Sacramento/ San Joaquin Delta

For decades, the region has been the focus of competing interests—economic and ecologic, and urban and agricultural. These conflicting demands have resulted in a number of threats to Bay-Delta resources:

- Declining fish and wildlife habitat.
- Native plant and animal species becoming threatened with extinction.

Some Delta Statistics

- 738,000 acres including 538,000 acres of irrigated agriculture
- 750 plant and animal species
- Source of drinking water for 22 million Californians
- Supplies irrigation water for the 45% of the nation's produce grown in California

- Degradation of the Delta as a reliable source of high quality water.

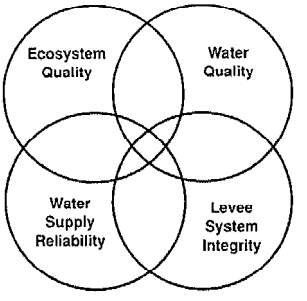
- A Delta levee system faced with an unacceptably high risk of failure.

Even though environmental, urban, and agricultural interests have recognized the Delta as a critical resource, for decades they have been unable to agree on appropriate management of the Delta resources. Consequently, the numerous "traditional" efforts to address the Bay-Delta problems, including government decrees, private remediation efforts, and seemingly endless rounds of litigation, have failed to reverse the steady decline of the Delta as fish and wildlife habitat and as a reliable source of water.

Interrelationships of Bay-Delta Problems and Solutions

What are the problems that face the Bay-Delta and why have they occurred? At the simplest level, problems occur when demands conflict over the use of resources from the Bay-Delta system. As California's population increases, we ask more of the system and there is more conflict. Single-purpose efforts to solve problems often fail to address these conflicts. To the extent that these efforts acquire or protect resources for one interest, they may cause impacts on other resources and increase the level of conflict. In the past, most efforts to improve water supply reliability or water quality, improve ecosystem health, or maintain or improve the Delta levees were single-purpose projects. Single-purpose projects have the potential to solve one problem but create other problems, and thereby engender opposition to future actions.

The CALFED Bay-Delta Program has taken a different approach, recognizing that many of the problems in the Bay-Delta system are interrelated. Problems in one resource problem area cannot be solved effectively without addressing problems in all four problem areas at once. This greatly increases the scope of our efforts but ultimately will enable us to make progress and move forward to a lasting solution.



1.1.2 DEVELOPMENT OF THE CALFED BAY-DELTA PROGRAM

The CALFED Bay-Delta Program (Program) was established in May 1995. CALFED is a consortium of eight state and ten federal agencies with management and regulatory responsibilities in the Bay-Delta estuary.

State and federal agencies participating in CALFED are noted in the box on the next page. They are listed according to their respective roles in preparation of the Programmatic Environmental Impact Statement/ Environmental Impact Report (EIS/EIR).

Seeking solutions to the resource problems in the Bay-Delta, state and federal agencies signed a "Framework Agreement" in June 1994. As part of the Framework Agreement, the state and federal governments pledged to (l) coordinate their implementation of water quality standards to protect the Bay-Delta estuary; (2) coordinate the operation of the State Water Project (SWP) and the Central Valley Project (CVP), which both involve transporting fresh-water through the Delta to points south; and (3) develop a process to establish a long-term Bay-Delta solution that will address four categories of problems: ecosystem quality, water quality, water supply reliability, and levee system vulnerability.

The impetus to forge this joint effort came at the state level in December 1992 with the formation of the State Water Policy Council and the Bay-Delta Oversight Council, an advisory group to the State Water Policy Council. In September 1993, the Federal Ecosystem Directorate was created to coordinate federal

resource protection and management decisions for the Bay-Delta.

The Framework Agreement laid the foundation for the Bay-Delta Accord and CALFED. The Accord, also called the Principles for Agreement on Bay-Delta Standards between the State of California and the Federal Government, detailed interim measures for both environmental protection and regulatory stability in the Bay-Delta. On December 15, 1994, the Accord was signed by state and federal resource agencies, with the cooperation of local water agencies and environmental organizations. The Accord was set to expire on December 15, 1997. In late 1997, the state and federal signatories to the Accord extended its effect through December 31, 1998. In December 1998, a second 1-year extension was signed, extending the Accord until December 1999. The Accord was again extended until September 15, 2000.

Role of CALFED Agencies in Preparation of Programmatic EIS/EIR

Lead Agencies—State and federal agencies who have the principal responsibility for carrying out or approving the project:

- Resources Agency of California
- U.S. Fish and Wildlife Service
- U.S. Bureau of Reclamation
- U.S. National Marine Fisheries Service
- U.S. Environmental Protection Agency
- U.S. Natural Resource Conservation Service
- U.S. Army Corps of Engineers

Responsible Agencies—State agencies, other than the lead agency, with a legal responsibility for carrying out or approving the project:

- California Environmental Protection Agency
- California Department of Fish and Game*
- California Department of Water Resources
- California State Water Resources Control Board

Cooperating Agencies—Federal agencies, other than the lead agencies, with jurisdiction by law or special expertise with respect to any environmental impact:

- U.S. Forest Service
- U.S. Geological Survey
- U.S. Western Area Power Administration
- U.S. Bureau of Land Management

Other Agencies—Agencies that regularly participate:

- Delta Protection Commission
- California Department of Food and Agriculture
- The Reclamation Board

* The California Department of Fish and Game is also a trustee agency with jurisdiction over natural resources held in trust for the people of California.

CALFED oversees the coordination and increased communication between federal agencies, state agencies, and stakeholders in three areas outlined in the Framework Agreement:

- Substantive and procedural aspects of water quality standard setting.
- Improved coordination of water supply operations with endangered species protection and water quality standard compliance.
- Development of a long-term solution to fish and wildlife, water supply reliability, flood control, and water quality problems in the Bay-Delta.

The Program is charged with responsibility for the third issue identified in the Framework Agreement. This Programmatic EIS/EIR evaluates this long-term program.

1.1.3 STRUCTURE OF THE PROGRAM

In addition to the CALFED agencies, Bay-Delta stakeholders contribute to the Program design and the problem-solving and decision-making process. The public participation and input that have been essential throughout the process have included the Bay-Delta Advisory Council (BDAC) and public participation in workshops, scoping meetings, comment letters, and other public outreach efforts. The BDAC charter is described in the adjacent text box.

Bay-Delta Advisory Council

The Bay-Delta Advisory Council (BDAC) is chartered under the Federal Advisory Committee Act and includes representatives of stakeholders, including water districts and utilities, environmental organizations, the California Farm Bureau, and sport fishing organizations from throughout California. The BDAC meets regularly with CALFED agencies and staff to review the status of work on developing the recommended program. Additionally, BDAC has formed several subcommittees, called "work groups," on various issues to provide more focused attention on particularly complex issues. This group of public advisors helps define problems in the Bay-Delta, helps to assure broad public participation, and offers advice on proposed solutions.

The CALFED agencies appointed an Executive Director to oversee the process of developing a long-term comprehensive plan for the Delta. The Executive Director selected staff from the CALFED agencies to carry out the task. In addition, the CALFED agencies and stakeholders worked with the Program through a variety of multi-level technical and policy teams.

The Program was divided into a three-phase cooperative planning process (Figure 1-2) intended to identify an appropriate strategy to reduce conflicts in the Bay-Delta system. Phase I began in May 1995 with a series of public workshops to define the problems of the Bay-Delta and begin work on developing a range of alternatives to solve the Bay-Delta system problems. The Program participants worked to clearly define the fundamental problems in the Bay-Delta system: ecosystem quality, water supply reliability, water quality, and levee system integrity. This effort resulted in the development of a mission statement, solution principles, and objectives (on the following page) for the Program. In addition, an initial group of actions was developed and refined into three preliminary categories of solutions (Section 1.4.1). Phase I was completed in August 1996.

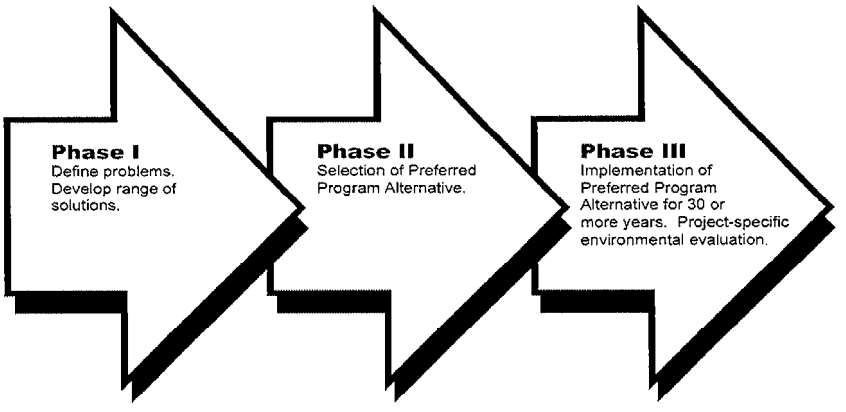


Figure 1-2. Three Phases of the CALFED Process

CALFED Bay-Delta Program Mission Statement

The mission statement does not stand alone as a single statement of Program purpose. Rather, the mission statement is supported by sets of primary objectives and solution principles. The mission statement is important and reflects the basic intent of the Program. However, the full expression of the Program mission is reflected in the mission statement, objectives, and solution principles, read together.

Mission Statement

The mission of the CALFED Bay-Delta Program is to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.

Primary Objectives of the CALFED Program

- *Ecosystem Quality* - Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.
- *Water Supply* - Reduce the mismatch between Bay-Delta water supplies and the current and projected beneficial uses dependent on the Bay-Delta system.
- *Water Quality* - Provide good water quality for all beneficial uses.
- *Vulnerability of Delta Functions* - Reduce the risk to land use and associated economic activities, water supply, infrastructure, and the ecosystem from catastrophic breaching of Delta levees.

Solution Principles

The solution principles were developed as a means to achieve the Program's objectives in the context of a multi-purpose mission and a history of (competing) contentious environmental, political, and institutional influences on the affected resources. The solution principles provide an overall measure of the acceptability of alternatives and guide the design of the institutional part of each alternative. The solution principles are:

- **Reduce conflicts in the system**. Solutions will reduce major conflicts among beneficial uses of water.
- **Be equitable**. Solutions will focus on solving problems in all problem areas. Improvement for some problems will not be made without corresponding improvements for other problems.
- **Be affordable**. Solutions will be implementable and maintainable within the foreseeable resources of the Program and stakeholders.
- **Be durable**. Solutions will have political and economic staying power and will sustain the resources they were designed to protect and enhance.
- **Be implementable**. Solutions will have broad public acceptance and legal feasibility, and will be timely and relatively simple to implement compared with other alternatives.
- **Pose no significant redirected impacts**. Solutions will not solve problems in the Bay-Delta system by redirecting significant negative impacts, when viewed in their entirety, within the Bay-Delta or to other regions of California.

Phase II is ongoing and will culminate with a federal Record of Decision (ROD) and state Certification (CERT) of the Programmatic EIS/EIR in 2000. Phase II includes development of the Preferred Program Alternative and development of an Implementation Plan focusing on the first 7 years following the ROD/CERT. Section 1.4.2 presents the Phase II alternative development process.

During Phase III, the CALFED agencies will implement the Preferred Program Alternative. This phase will include any necessary studies and site-specific environmental review and permitting. Because of the size and complexity of the Program alternatives, implementation is likely to take place over a period of 30 years or more. Part of the challenge for Phase II is designing an implementation strategy that acknowledges this long planning horizon and ensures that all participants remain committed to the successful completion of all phases of implementation.

1.2 PROJECT DESCRIPTION AND PROGRAM PURPOSE AND NEED

Approval of the ROD/CERT of this Programmatic EIS/EIR provides the general direction for long-term implementation of the CALFED Program. The Program includes a range of balanced actions that can be taken to move forward on a comprehensive, multi-agency approach to managing Bay-Delta resources. The Programmatic EIS/EIR allows the decision makers and the public to evaluate the consequences of the alternative approaches to accomplishing the goals and objectives of the Program at a programmatic planning stage. Thus, the "project" as an element of the California Environmental Quality Act (CEQA) is a decision to approve the long-term, multi-stage plan as described in this Programmatic EIS/EIR.

Purpose Statement

The purpose of the CALFED Program is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.

Additional specific information will be necessary for subsequent decisions during implementation of the Program over the next 30 or more years. Thus, the project is the approved planning road map for achieving the CALFED Program purpose: to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. Although the decision affects a broader geographical area, the decision in the ROD/CERT of this Programmatic EIS/EIR is similar to the approval of a general plan on a local level for a city or county. The general plan sets the broad policy direction for a wide range of possible future actions while allowing the opportunity for flexibility to changing needs.

Each of the four primary objectives for the Program set forth on page 1-5 must be met to achieve the project purpose. Each alternative examined, including the Preferred Program Alternative, is designed to meet these objectives in a comprehensive, integrated manner.

The purpose of the Program is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. To practicably achieve this program purpose, CALFED will concurrently and comprehensively address problems of the Bay-Delta system within each of four resource categories: ecosystem quality, water

quality, water supply reliability, and levee system integrity. Important physical, ecological, and socioeconomic linkages exist between the problems and possible solutions in each of these categories. Accordingly, a solution to problems in one resource category cannot be pursued without addressing problems in the other resource categories.

Because of the complexity of the problems and solutions being considered, the following goals and objectives are described to explain how the Program intends to achieve the purpose within each of these four critical resource categories.

Ecosystem Quality. The goal for ecosystem quality is to improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta system to support sustainable populations of diverse and valuable plant and animal species. This can be accomplished by addressing the objectives, which collectively improve and increase aquatic and wetland habitats so that they can support the sustainable production and survival of estuarine and anadromous fish and wildlife species, and increase population health and population size to levels that assure sustained survival. The objectives in summary form are:

1. Increase the amount of shallow riverine, shaded riverine, tidal slough, and estuary entrapment and null zone habitats for aquatic species.

2. Improve the in-Delta, upstream, and downstream movement of larval, juvenile, and adult life stages of aquatic species.

3. Reduce water quality degradation.

4. Increase the amount of brackish tidal marsh, fresh-water marsh, riparian woodland, waterfowl breeding habitat, wintering range for wildlife, managed permanent pasture and floodplains, and associated riparian habitats for wildlife species.

5. Contribute to the recovery of threatened or endangered species and species of special concern.

Water Supply Reliability. The goal for water supply reliability is to reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system. This can be accomplished by addressing the objectives, which collectively reduce the conflict among beneficial water users, improve the ability to transport water through the Bay-Delta system, and reduce the uncertainty of supplies from the Bay-Delta system. These objectives in summary form are:

1. Maintain an adequate water supply to meet expected in-Delta beneficial use needs.

2. Improve export water supplies to help meet beneficial use needs.

3. Improve the adequacy of Bay-Delta water to meet Delta outflow needs.

4. Reduce the vulnerability of Bay-Delta levees.

5. Improve the predictability of the water supply available from the Bay-Delta system for beneficial use needs.

Water Quality. The goal for water quality in the Bay-Delta system is to provide good-quality water for all beneficial uses, including drinking water, agricultural uses (both in-Delta and exported), industrial uses, recreational in-Delta uses, and Delta aquatic habitats. This can be accomplished by addressing the objectives, which collectively provide for the improvement of water quality for all beneficial uses. The objectives in summary form are:

1. Improve the reliability and quality of raw water for drinking water needs.
2. Reduce constituents in agricultural water that affect operations and crop productivity.
3. Improve the reliability and quality of water for industrial needs.
4. Improve the quality of raw water for recreational uses including consumption of aquatic resources.
5. Improve the quality of water for environmental needs.

Levee System Integrity. The goal for levee system integrity is to reduce the risk to land uses and associated agricultural and other economic activities, water supply, infrastructure, and the Bay-Delta ecosystem from catastrophic breaching of Delta levees. This can be accomplished by addressing the objectives, which collectively provide management of the risk resulting from gradual deterioration of Delta conveyance and catastrophic breaching of the Delta levees. The objectives in summary form are:

1. Reduce the risk to land use from seepage and overtopping of the levees, subsidence of peat soils, and catastrophic inundation of Delta islands.

2. Reduce the risk to in-Delta and export water supply from sudden catastrophic island inundation and the resultant salinity intrusion.

3. Reduce the risk to in-Delta and export water supply facilities from sudden catastrophic island inundation.

4. Reduce the risk to the existing Delta ecosystem from seepage, erosion, and overtopping of levees; from peat soils; and from catastrophic island inundation and the resultant salinity intrusion.

The purpose statement responds to the following needs.

Ecosystem Quality. The health of the Bay-Delta system has declined as a result of a number of factors, including degradation and the loss of habitats that support various life stages of aquatic and terrestrial biota. Further, the decline in health has resulted from activities within and upstream of the Bay-Delta system. One early human-induced event was hydraulic mining in the river drainages along the eastern edge of the Central Valley. The mining degraded habitat in Central Valley streams as channel beds and shallow areas filled with sediment. In addition, the reduced capacity of the sediment-filled channels increased the frequency and extent of periodic flooding, accelerating the need for flood control measures to protect adjacent agricultural, industrial, and urban lands. Levees constructed to protect these lands eliminated fish access to shallow overflow areas, and dredging to construct levees eliminated the tule bed habitat along the river channels.

Since the 1850s, 700,000 acres of overflow and seasonally inundated lands in the Bay-Delta system have been converted to agricultural, industrial, and urban uses. Many of the remaining stream sections have been dredged or channelized to improve navigation and to increase stream conveyance capacity in order to accommodate flood flows and facilitate water export.

Upstream water development and use, depletion of natural flows by local diverters, and the export of water from the Bay-Delta system have changed seasonal patterns of the inflow, reduced the outflow, and diminished the natural variability of flows into and through the Bay-Delta system. Facilities constructed to support water diversions (upstream, in-Delta, and export facilities) cause straying or direct losses of fish (for example, through unscreened diversions) and can increase exposure of juvenile fish to predation. Entrainment and removal of substantial quantities of food-web organisms, eggs, larvae, and young fish further exacerbate the impacts of overall habitat decline.

Habitat alteration and water diversions are not the only factors that have affected ecosystem health. Water quality degradation caused by pollutants and increased concentrations of substances also may have contributed to the overall decline in the health and productivity of the Bay-Delta system. In addition, undesirable introduced species may compete for available space and food supplies, sometimes to the detriment of native species or economically important introduced species.

Water Supply Reliability. The Bay-Delta system provides the water supply for a wide range of in-stream, riparian, and other beneficial uses—such as drinking water for millions of Californians and irrigation water for agricultural land. While some beneficial water uses depend on the Bay-Delta system for only a portion of their water needs, others are highly or totally dependent on Bay-Delta water supplies. As water use and competition among uses has 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.

Water flow and timing requirements have been established for certain fish and wildlife species with critical life stages that depend on fresh-water 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 Bay-Delta system water for agricultural, industrial, and urban purposes.

Delta levees and channels may fail. Water users are concerned that such failures could result in an interruption of water supply for both urban and agricultural purposes, and degradation of water quality and aquatic habitats.

Water Quality. Good-quality water is required to sustain the high-quality habitat needed in the Bay-Delta system to support a diversity of fish and wildlife populations. In addition, the Bay-Delta system is a source of drinking water for millions of Californians and is critical to the state's agricultural sector. The potential for increasingly stringent drinking water requirements that require new treatment technologies is spurring water providers to seek higher quality source waters and to address pollution in source waters. Pollutants enter the Bay-Delta system through a variety of sources, including sewage treatment plants, industrial facilities, forests, farm fields, mines, residential landscaping, urban streets, ships, and natural sources. The pollutants, pathogens, natural organics, and salts in the Bay-Delta system affect, in varying degrees, existing fish and wildlife, as well as human and agricultural uses of these waters. The salts entering the Bay-Delta system from the ocean and from return flows upstream and within the Delta decrease the utility of Bay-Delta system waters for many purposes, including the ecosystem, agriculture, and drinking water. The level of natural organics in the water (resulting primarily from the natural process of plant decay on many of the Delta peat soil islands) is of concern because of by-products formed from natural organics reacting with disinfection chemicals commonly used to meet public health requirements in water treatment.

Levee System Integrity. Levees were first constructed in the Delta during the late 1800s, when settlers began to turn tidal marshes into agricultural land. Over time, both natural settling of the levees and shallow subsidence (oxidation, which lowers the level of the land over time) of the Delta island soils resulted in a need to increase levee heights to maintain protection. There is a growing concern that this increased height, coupled with poor levee construction and inadequate maintenance, make Delta levees vulnerable to failure, especially during earthquakes or floods. Failure of Delta levees can result in flooding of Delta farmland and wildlife habitat. If a flooded island is not repaired and drained, the resulting large body of open water can expose adjacent islands to increased wave action and possible levee erosion. Levee failure on specific islands can affect water supply distribution systems, such as the Mokelumne Aqueduct. Similarly, levee failure on key Delta islands can draw salty water up into the Delta, as water from downstream rushes to fill the breached island. This is of particular concern in low-water years when less fresh water is available to repel the incoming salt water. Such a failure could interrupt the water supply for urban, agricultural, and environmental uses, and degrade water quality and aquatic habitats.

1.3 PROGRAM GEOGRAPHIC SCOPE

The geographic scope of analysis and actions for the Program that evolved through both technical and public forum discussions focuses on the Bay-Delta system for purposes of problem definition, while allowing solution generation from a much broader area.

1.3.1 CALFED PROBLEM AND SOLUTION AREAS

The Program is addressing problems that have been identified in or closely linked to the Suisun Bay/Suisun Marsh and Delta area (see Figure 1-3). However, the scope of possible solutions to these problems encompass any action that can be implemented by the CALFED agencies, or can be influenced by them, to address the identified problems—regardless of whether implementation takes place in the Delta/Suisun Bay/Suisun Marsh area.

Any problem currently associated with (1) the management and control of water in the Bay-Delta, or (2) the beneficial use of water in the Bay-Delta (including both environmental and economic uses) is within the purview of the Program if at least part of the problem is located in the Bay-Delta or is directly associated with conditions in the Bay-Delta.

In contrast to the problem scope, the solution scope is quite broad, potentially including any action that could help solve identified problems in the Bay-Delta. An expanded solution scope is necessary because many problems related to the Bay-Delta are caused by factors outside the Bay-Delta. Moreover, an expanded solution scope is desirable from a planning point of view because more benefits may be generated at lower cost if solutions are not limited to the geographic Bay-Delta. For example, the problem of declining salmon populations is linked to the Bay-Delta because of high salmon mortality during salmon migrations. However, the broader problem of declining salmon populations extends far beyond the Bay-Delta. One solution action might be to reduce salmon mortality during salmon migration through the Bay-Delta. However, it might be less expensive and more effective to combine that action with an effort to promote greater salmon protection upstream.

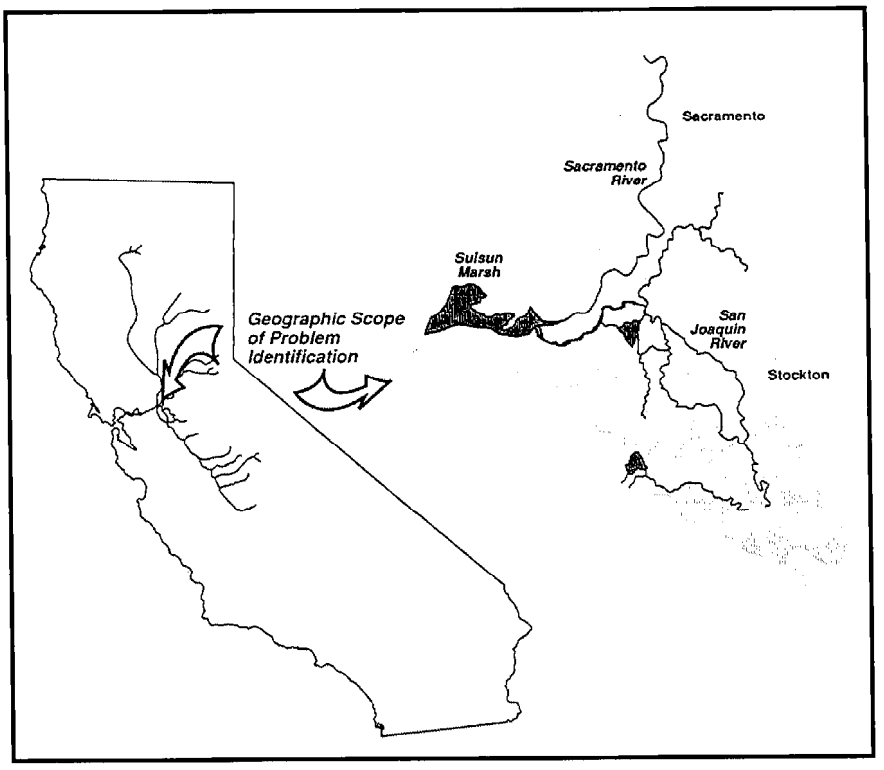


Figure 1-3. Geographic Scope of the Program Problem Area

1.3.2 DESCRIPTION OF THE STUDY AREA

The Program study area includes both the problem and solution areas mentioned in Section 1.3.1. The Program study area map is included as a pull out inside the back cover of this report. The study area has been broken down into regions: the Delta Region, the Bay Region, the Sacramento River Region, the San Joaquin River Region (including the Tulare Lake Basin), and the Other SWP and CVP Service Areas.

Delta Region

The Delta Region is defined in California Water Code Section 12220 and is comprised roughly of lowlands (lands approximately at or below the 5-foot contour) and uplands (lands above the 5-foot contour that are served water by lowland Delta channels). The Delta Region has been carved out of the Sacramento River and San Joaquin River watersheds because of its legal status and the Program's focus on this region.

Bay Region

The Bay Region includes Suisun Bay and Marsh, San Pablo Bay, and the San Francisco Bay watershed. In addition, an off-shore band, approximately 25 miles wide that runs from Point Conception to the Oregon border, has been included to cover anadromous fish along the California coast.

The upper watershed areas of the Bay Region include the unregulated watersheds that drain directly into San Francisco Bay, and the watershed areas upstream of existing reservoirs and fish migration barriers in the San Francisco Bay Area. These areas include the east-sloping drainages of San Mateo, San Francisco, and Marin Counties; north- and west-sloping drainages of Contra Costa and Alameda Counties; and the east- and north-sloping drainages of Santa Clara County. The major creeks in the Bay Region include Miller, Corte Madera, San Rafael, Novato, San Ramon, Walnut, Pacheco, Wildcat, Alameda, Berryessa, Coyote, Guadalupe, Stevens, and San Francisquito.

Sacramento River Region

The Sacramento River Region essentially is bounded by the ridge tops of the Sacramento River watershed or hydrologic region. The Trinity River is connected by a pipeline to the Sacramento River system and contributes to the CVP water supply. Because of this contribution, the watershed area from which Trinity River flows are diverted into the Bay-Delta system is included in the geographic scope of the Program study area. The Goose Lake watershed, in the northeast corner of California, has been left out of the study area because it rarely contributes to the flow of the Pit and Sacramento Rivers.

The upper watershed areas of the Sacramento River Region can be subdivided into three sub-regions on the north, east, and west sides of the Sacramento Valley. The upper watershed areas on the north side of the valley include all or portions of Shasta, Siskiyou, and Trinity Counties. The upper watershed areas on the east side of the valley include all or portions of the following counties: Butte, El Dorado, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Sierra, and Yuba. The upper watershed areas on the west side of the valley include all or portions of the following counties: Colusa, Glenn, Lake, Napa, Solano, Tehama, and Yolo.

San Joaquin River Region

The San Joaquin River Region includes both the San Joaquin and Tulare Lake hydrologic basins.

Upper watershed areas of the San Joaquin River Region encompass the watersheds and major tributaries upstream of the existing reservoirs and fish migration barriers in the San Joaquin River Region. During years of high flood flows, the region may include the areas of the Kings River drainage upstream of Pine Flat Reservoir. The major rivers of the San Joaquin River watershed include the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, San Joaquin, Chowchilla, and Fresno. The upper watershed areas include all or portions of the following counties: Calaveras, Fresno, Kern, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tulare, and Tuolumne.

Other SWP and CVP Service Areas

The Other SWP and CVP Service Areas region includes two distinct, noncontiguous areas: in the north are the San Felipe Division's CVP service area and the South Bay SWP service area; to the south are the SWP service areas. The northern section of this region encompasses parts of the central coast counties of Santa Clara, San Benito, Santa Cruz, and Monterey. The southern portion includes parts of Imperial, Los

Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura Counties.

The upper watersheds in the Other SWP and CVP Service Areas are not described in this report because no specific watershed activities are proposed in these areas.

1.4 PROGRAM ALTERNATIVES DEVELOPMENT PROCESS

1.4.1 THE DEVELOPMENT, REVIEW, AND REFINEMENT OF ALTERNATIVES

In the past two decades, disagreements regarding the use and management of the Delta have increasingly taken the form of protracted litigation and legislative battles. These disagreements have not yielded solutions to the water-related conflicts centering in the Delta. The CALFED Program was established to reduce these conflicts and provide a solution that competing interests could support. The CALFED Program evaluated a wide range of alternatives to determine the best way to fulfill its mission (see page 1-5). Because both of the purposes composing the CALFED mission are essential to the success of the CALFED Program, only alternatives that would both restore ecological health and improve water management for beneficial uses of the Bay-Delta system were carried forward for detailed consideration. Each alternative (other than the No Action Alternative) considered in detail in this document would achieve these purposes.

In Phase I, CALFED initiated a lengthy, inclusive public process to develop alternatives in order to accomplish its mission. The Phase I process developed alternatives in six steps: identify problems, define objectives, identify actions, develop solution strategies, assemble alternatives, and refine alternatives. Early in Phase I, the Program identified 50 categories of actions to resolve Bay-Delta problems and achieve Program objectives. These action categories were drawn from existing literature and participation from CALFED agencies, the BDAC, and numerous workshops with stakeholders and the general public. Within these categories, hundreds of individual actions were defined. The action categories represent the building blocks of the alternatives—that is, each alternative is a combination of action categories reflecting differing approaches to achieving Program objectives and addressing solution principles (see page 1-5).

Given the large number of categories and the range of perspectives on solutions to Bay-Delta problems among stakeholders and CALFED agencies, thousands of potential alternatives could have been identified. A first step for the Program was to devise a methodology that would keep the number of alternatives to a manageable level while still representing the full range of approaches to resolving problems.

The methodology chosen to accomplish this was to define the critical conflicts that exist between beneficial uses and resources in the Bay-Delta and then to define approaches to resolving these conflicts. The following conflicts were identified:

- **Fisheries and Diversions.** The conflict between fisheries and diversions results primarily from fish mortality attributable to water diversions. This includes direct loss at pumps, reduced survival when

young fish are drawn out of river channels into the Delta, and reduced spawning success of adults when migratory cues are altered. The effects of diversions on species of special concern have resulted in regulations that restrict the quantities and timing of diversions.

- **Habitat and Land Use and Flood Protection.** Habitat to support various life stages of aquatic and terrestrial biota in the Bay-Delta has been lost because of land development and construction of flood control facilities to protect developed land. The need for habitat affects land development planning as well as levee maintenance and planning. Efforts to restore the balance often require that land used for agricultural production be dedicated to habitat.

- **Water Supply Availability and Beneficial Uses.** As water use and competition for water have increased during the past several decades, conflict also has increased among users. A major part of this conflict is between the volume of in-stream water needs and out-of-stream water needs, and the timing of those needs within the hydrologic cycle.

- **Water Quality and Land Use.** Water quality can be negatively affected by land use, and ecosystem water quality needs are not always compatible with urban and agricultural water quality needs.

In assessing these conflicts, alternate approaches to conflict resolution and alternative levels of resolution were defined. Approaches for resolving the fisheries and diversions conflict included: (1) a fish productivity approach, and (2) a diversion modification approach. Approaches for resolving the habitat and land use and flood protection conflict included: (1) an existing land use pattern approach, and (2) a modified land use pattern approach.

Approaches for resolving the water supply availability and beneficial uses conflict included: (1) a demand reduction approach, and (2) a supply enhancement approach. Approaches for resolving the water quality and land use conflict included: (1) managing the quality of Delta inflows, and (2) managing in-stream water quality after discharges had occurred. Within each of these approaches, levels of conflict resolution ranging from less intensive to more intensive were identified.

This process produced 32 separate approaches to resolving the four conflicts. At this point, four teams of experts representing a variety of technical disciplines were formed—one team for each conflict area. These teams then were assigned an equal number of the 32 approaches (eight apiece), and directed to develop approximately three preliminary solution alternatives—sets of actions and action categories—for each of the eight approaches.

This procedure identified 100 preliminary solution alternatives that subsequently served as the foundation for the refinement process that defined the short list of three basic alternatives to be included in the Phase II analysis. In the Program's judgment, these 100 solution alternatives were representative of the larger number of possible combinations and bracketed the range of possible solutions to the four conflicts and, therefore, to the key problems facing the Bay-Delta. These "prototypical" alternatives helped to demonstrate the advantages and disadvantages of a wider range of alternatives. In addition, the solution principles guided the development of alternatives.

The 100 preliminary alternatives were very broad by design. Moreover, they tended to address the four critical conflicts in varying degrees—that is, they were not necessarily balanced in addressing Program objectives and solution principles.

At this point in the process, leadership responsibility for the four teams was moved from the technical experts to Program staff. This change was made to take advantage of staff's specific expertise on Bay-Delta issues and to more systematically include Program team members in the process, in order to ensure maximum sensitivity to the policies and positions of the CALFED agencies and stakeholder groups. The Program teams were instructed to begin balancing their alternatives, and to refine the initial set to approximately 6-10 per area by combining those alternatives with similar characteristics. This process produced a refined list of 31 alternatives.

Continued consolidation and balancing of the alternatives brought the number to 20. These 20 alternatives were presented to stakeholders, BDAC members, and the public at a workshop. Consolidation and refinement based on input from that workshop produced the 10 alternatives described in the Program's April 1996 Phase I Progress Report.

The makeup of the alternatives during the process of refinement and development utilized different combinations of water management tools. The alternatives also varied in the level of effort applied to actions related to water use efficiency, water quality, ecosystem quality, and levee system vulnerability components. Levels of effort characterized as modest, moderate, or extensive were applied to these four components. The two components that included distinctly different approaches were Delta conveyance and water storage. For example, one alternative contained modest efforts in Bay and Delta habitat restoration and water pollutant source control, moderate efforts in system stabilization, and extensive conjunctive use and groundwater storage efforts. This alternative included an in-Delta surface storage component but no isolated conveyance component. Another alternative contained extensive efforts in Bay and Delta habitat restoration and water pollutant source control, modest efforts in system stabilization, and moderate conjunctive use and groundwater storage efforts. This alternative contained a large isolated conveyance component but no surface storage component.

During April 1996, the Program conducted 8 public meetings around the state, a workshop in Sacramento, and a meeting of the BDAC to discuss the 10 alternatives.

The comments received at the meetings and workshop cover a wide range of technical, policy, and financial concerns. Oral comments were generally consistent with comments contained in the over 160 letters received by the Program. Some of the comments prompted consideration of modifying the structure and presentation of the alternatives, as follows:

- **The best possible source water quality is of paramount importance to urban water supplies.** Agencies that deliver drinking water are very concerned about the cost of meeting future drinking water quality standards, as well as the technical challenges associated with treating source water of degraded quality. This suggests strong pollutant source control measures in every alternative.

- **Delta levees will be needed to protect agriculture, infrastructure, and habitat no matter how water is conveyed in the Delta.** Delta levees protect many values, including farms, habitat, infrastructure, and Delta water quality. Even if a new conveyance facility is built that protects water quality for some export users, adequate levee integrity will still be required to protect water quality and many other values in the Delta. This argues for a similar level of Delta levee protection in each alternative.

- **Ecosystem actions at the modest and perhaps the moderate level appear inadequate; the Program needs a single coherent vision of ecosystem restoration.** The restoration of ecosystem functions and the recovery of Bay-Delta species likely will require diverse actions that will be extensive in scope. There is really no alternative to a single comprehensive plan for restoring ecosystem health. Adaptive management will be vital in guiding efforts to improve ecosystem quality. It is this adaptive management that will provide the needed flexibility in the Ecosystem Restoration Program.

- **Water use efficiency must be strongly pursued in all the alternatives.** This suggests that water use efficiency measures should be implemented at an increased level among all the alternatives, where previously some alternatives included efficiency at modest or moderate levels.

The next activity for the Program included additional refinement of alternatives, which led to selection of a set of Phase II alternatives that was large enough to offer a reasonable range of solutions while small enough to allow for detailed analysis. Application of the solution principles to the 10 draft alternatives provided for alternative refinement and consideration.

The refinement and consolidation of the 10 alternatives proceeded according to the following steps:

1. Review how each alternative satisfies the mission statement and primary objectives.

2. Review comments from CALFED, BDAC, scoping meetings, workshops, stakeholders, and the public on each alternative.

3. Evaluate and document how well each alternative satisfies each solution principle.

4. Determine potential ways to modify each alternative in order to improve any "low" solution principle ratings.

5. Verify that the alternative, if revised, would still meet the primary objectives and the other solution principles.

6. Review the alternatives and potential modifications to identify improved alternatives.

7. Merge similar improved alternatives into a single alternative.

Staff from CALFED agencies and the Program team evaluated alternatives against solution principles. As the detailed solution principles were applied to the 10 alternatives, and modifications were devised to improve low solution principle ratings, a pattern emerged. The results confirmed that the set of Phase II alternatives could be defined by combining the four common programs with the two variable components (storage and conveyance).

The above comments and the evaluation of alternatives against the solution principles supported the conclusion that water use efficiency, water quality, levee system integrity, and ecosystem quality were necessary in each of the alternatives to achieve the Program's purpose and needed to be composed of the same actions in all alternatives. Although the goal is to implement each of these programs at high levels in order to effectively achieve the Program's purpose, they will be implemented incrementally, or in

stages, over time. This approach will provide flexibility for monitoring and adapting actions in response to the results of the initial actions.

Based on this information, the fundamental structure of the alternatives was simplified. Three basic alternative approaches were formed around different configurations of Delta conveyance: existing system conveyance, modified through-Delta conveyance, and dual-Delta conveyance. Each approach includes the same set of four programs that are common to all alternatives and involves water use efficiency, water quality, levee system integrity, and ecosystem quality. Storage for each alternative could be evaluated to support these programs and the Delta conveyance, and to seek a balance between attainment of Program objectives and cost effectiveness. Phase I thus identified four essential common Program elements and two variable Program elements, storage and conveyance, that composed the Program alternatives.

1.4.2 Identification of the Preferred Program Alternative

The three basic alternative approaches from Phase I were carried into Phase II. A number of tasks were undertaken during Phase II to further refine the alternatives. Two program elements were added to each alternative because of their value in helping the Program meet its multiple objectives. (Water Transfers evolved as an outgrowth of the Water Use Efficiency Program, and watersheds arose from the Water Quality Program.) Eight Program elements thus were considered during Phase II: six common elements (water use efficiency, water quality, levee system integrity, ecosystem quality, water transfers, and watersheds) and two variable program elements (storage and conveyance).

Seventeen variations of the three basic alternative approaches then were developed to further explore potential refinements for the two variable Program elements, storage and conveyance. These included three variations for Alternative 1, four variations for Alternative 2, and five variations for Alternative 3. Five variations were eliminated from further consideration due to technical and other considerations (see Section 2.4). The narrowing process primarily focused on technical deficiencies and the conveyance options used in each alternative. Additionally, if alternatives provided the same conveyance function with similar impacts, the less expensive alternatives were retained. Alternatives with lower costs but higher adverse impacts were eliminated. The impacts of the 12 remaining variations were evaluated in the March 1998 Draft Programmatic EIS/EIR (State Clearinghouse Number 96032083 and Federal Draft Environmental Statement Number 98-09).

Looking simultaneously at all the information on how well the alternatives meet the objectives and how well they satisfy the solution principles would be nearly impossible due to the large amount of information. On the other hand, some aspects differ among the alternatives. These aspects, or distinguishing characteristics, guided the selection of the Preferred Program Alternative. The 18 distinguishing characteristics are in-Delta water quality, export water quality, diversion effects on fisheries, Delta flow circulation, storage and release of water, water supply opportunities, water transfer opportunities, operational flexibility, south Delta access to water, risk to export water supplies, total cost, assurances difficulty, habitat impacts, land use changes, socioeconomic impacts, consistency with solution principles, ability to phase facilities, and brackish water habitat.

The Preferred Program Alternative process began by examining how each of the 12 alternative variations performed when measured against the 18 distinguishing characteristics. (For additional discussion of the process of developing the Preferred Program Alternative, see the March 1998 Phase II Interim Report.) This assessment revealed the comparative technical advantages of each alternative.

In the assessment, two key distinguishing characteristics were particularly important in identifying how well the alternatives perform. Export water quality and diversion effects on fisheries are highly dependent on the alternative selected. Therefore, irrespective of whether these two characteristics are the most important to selection of the Preferred Program Alternative, they are the characteristics most dependent on that decision.

Some of the 12 variations were eliminated or consolidated (see Section 2.4). Technical reasons for elimination included possible creation of conditions potentially damaging to the aquatic environment and the lack of a south Delta conveyance improvements component.

The 4 action alternatives evaluated in this report are very similar to 3 of the 12 action alternative variations evaluated in the March 1998 Draft Programmatic EIS/EIR.

Alternative 1 is similar to Alternative Variation 1C, with and without storage, from the March 1998 Draft Programmatic EIS/EIR, with the addition of the Suisun Marsh levees and potential channel dredging for channel enlargement.

Alternative 2 is similar to Alternative Variation 2B, with and without storage, from the March 1998 Draft Programmatic EIS/EIR, with the same Suisun Marsh levees and potential channel dredging for channel enlargement.

Alternative 3 is similar to Alternative Variation 3E, with and without storage, from the March 1998 Draft Programmatic EIS/EIR, with the same Suisun Marsh levees and potential channel dredging for channel enlargement. Alternative 3 also includes evaluation of an isolated facility, ranging in size from 5,000 to 15,000 cubic feet per second (cfs).

The **Preferred Program Alternative** incorporates elements similar to some of the elements in Alternatives 1 and 2. While it includes a potential for a diversion facility on the Sacramento River and channel to the Mokelumne River, the size of this facility would be considerably smaller than under Alternative 2. If, after additional analysis, this new facility is not constructed, the Preferred Program Alternative would be most similar to Alternative 1.

The three basic Program alternatives and the Preferred Program Alternative are described in detail in Chapter 2. Section 2.4 discusses the alternative variations that were not carried forward for further evaluation in the Programmatic EIS/EIR.

1.5 NEXT STEPS

Following the ROD/CERT of the Programmatic EIS/EIR, the CALFED agencies will implement the Program.

1.5.1 Actions That Will Be Taken Based on This Document

It is anticipated that future lead agencies, responsible agencies, and stakeholder local agencies, such as water districts, will rely on the Programmatic EIS/EIR as they consider subsequent actions. As appropriate, subsequent actions will be subject to alternative analysis, environmental review, and permitting decisions before they are implemented.

The Multi-Species Conservation Strategy (MSCS) is a part of the Program. The environmental consequences of implementing the MSCS are described in the Programmatic EIS/EIR, in conjunction with the analysis of the Program as a whole. At a programmatic level, the environmental effects of implementing the conservation measures in the MSCS are within the parameters of the environmental effects described in the Programmatic EIS/EIR for implementing the various Program elements and the associated mitigation strategies. Additional environmental review of individual Program actions will tier from the Programmatic EIS/EIR and provide further detail about the environmental effects of implementing MSCS conservation measures.

Program EIS/EIR

This environmental document is a Program EIS/EIR that is intended to allow the co-lead agencies and responsible agencies to make an informed decision on approving and adopting the Preferred Program Alternative. The purpose of a Program EIS/EIR is to identify and assess the environmental impacts of a series of actions that comprise an overall program, such as the CALFED Long-Term Program Plan. As described in the State CEQA Guidelines Section 15168, a Program EIR:

> May be prepared on a series of actions that can be characterized as one large project and are related either: (1) geographically; (2) as logical parts in the chain of contemplated actions; (3) in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or (4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

California's Safe, Clean, Reliable Water Supply Act calls for the Programmatic EIS/EIR to include a schedule for implementing the long-term comprehensive plan. The schedule is presented in the Implementation Plan.

1.6 Relationship with Other Ongoing Programs

Due to the extent of the Program study area, many activities and studies are currently on-going or planned for the near future that could be affected by Program actions. Related studies and projects that have been conducted recently or are currently being completed are summarized in the following discussion. Not all of these actions are directly or indirectly related to the Program. Where appropriate, however, the effects of these actions are included in this Programmatic EIS/EIR. This listing should give the reader a general understanding of ongoing water resource issues in the State of California.

Water Rights Process for CVP and SWP (State Water Resources Control Board). As a followup to adopting the 1995 Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary (WQCP), the State Water Resources Control Board (SWRCB) is evaluating alternatives for implementing that plan. This process may increase the amount of water provided by other water rights holders to meet Bay-Delta water

quality standards. Consequently, operations of upstream projects may change. Because the outcome is not complete, a conservative assumption was used in modeling for the EIR prepared by the SWRCB for the project. It was assumed that the Bay-Delta Accord criteria would be the long-term plan for the Delta. If in-stream flows provided by the other water rights holders increases, some portion of the Ecosystem Restoration Program environmental flows could be satisfied by this water rights process, which may reduce the amount of water that the Program needs to acquire from willing sellers. Likewise, the CVP and SWP also may gain water if more of the responsibility for meeting the WQCP flows are allocated to water rights holders. The process also may reduce the amount of water that the Program needs to develop or may allow for the developed water to be used more effectively in meeting Program objectives. Any additional demand on water rights holders, beyond existing requirements, could decrease the amount of water available for transfer. The final results of the SWRCB process will need to be incorporated into the various components of the CALFED Bay-Delta system.

Central Valley Project Improvement Act (U.S. Bureau of Reclamation). On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) that included Title XXXIV, the Central Valley Project Improvement Act (CVPIA). The CVPIA amends previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses, and fish and wildlife enhancement as a project purpose equal to power generation. The impacts associated with the CVPIA have been analyzed in a Draft Programmatic EIS that was released in November 1997. The Final EIS was released in October 1999. The Program seeks to improve overall system reliability. The Program's objective of improving water reliability may help to offset any agricultural water impacts due to dedication of the 800 TAF to fish, wildlife, and habitat restoration purposes authorized under the CVPIA.

Place of Use EIR for CVP Water Supplies (U.S. Bureau of Reclamation/SWRCB). Some areas adjacent to the existing CVP service area have been served with CVP water. This process considered the impacts of expanding the SWRCB designated place of use for CVP water to include these areas. The SWRCB and U.S. Bureau of Reclamation (Reclamation) completed an EIR in November 1999 as part of the approval process. The modeling for this programmatic EIS/EIR assumes that the process will be completed by 2020, to include lands currently receiving CVP water. If it is not completed and approved, water would need to be used within the existing CVP service area. This may marginally increase the reliability of CVP deliveries and thereby marginally increase the overall reliability of the Program. The SWRCB reached a decision (D-1641) regarding expansion of the CVP place of use, finding that CVP water may be delivered to those lands that historically have received CVP water. Lands that historically have not received CVP water may be included in the CVP place of use only on a case-by-case basis, subject to appropriate CEQA documentation and SWRCB approval.

Trinity River Studies (U.S. Fish and Wildlife Service). In October 1984, the U.S. Fish and Wildlife Service (USFWS) began a 12-year study to describe the effectiveness of increased flows and other habitat restoration activities to restore fishery populations in the Trinity River. An EIS/EIR is being prepared under a concurrent program to evaluate alternatives to restore and maintain natural production of anadromous fish in the Trinity River mainstem downstream of Lewiston Dam. Historically, an average annual quantity of approximately 1.3 million acre feet (MAF) of water has been diverted from the Trinity River to the Sacramento River system (1964-1992). While the Trinity River is outside the Program study area, a change in the Trinity River flow requirements and a corresponding change in the amount of water diverted to the Sacramento River system will affect future flows to the Delta. Changes also could affect overall water supply reliability and carryover storage in Shasta Reservoir, and water quality and

temperature in the Sacramento River. A range of possible future Trinity River flow requirements has been considered in this programmatic evaluation (see Attachment A for additional detail).

Bulletin 160-98, California Water Plan Update (DWR). Bulletin 160, updated every 5 years by DWR, contains estimates of future water demands in the state. Modeling for the Programmatic EIS/EIR considers a range of possible future demands for the No Action Alternative and the Program alternatives. The high end of this range is bound by the most recent demand estimates prepared for Bulletin 160-98 for 2020. The low end of the range is bounded by the 1995 water-year demands.

Sacramento and San Joaquin River Basins Comprehensive Study (U.S. Army Corps of Engineers). In January 1997, California experienced one of the most costly and geographically extensive flood disasters in the history of the state. Major storms throughout California caused record flows on many rivers. In the Central Valley, storms stressed the flood management systems for the Sacramento and San Joaquin Rivers to their capacity and beyond. Although reservoir flood storage reduced flood flows by 50% or more, saving lives and significantly reducing property damage, levees failed in some areas. Two major levee breaks occurred on the Sacramento River and its tributaries. Many levees that did not fail were severely damaged and required extensive repairs. On the San Joaquin River, levees failed in more than two dozen places. Damages in both systems exceeded $0.5 billion.

In response to extensive flooding and damages in 1997, the U.S. Congress authorized the U.S. Army Corps of Engineers (Corps) to provide a comprehensive analysis of the Sacramento River and San Joaquin River basin flood management systems, and to partner with the State of California to develop master plans for flood management into the next century. The Corps and the California Reclamation Board are leading a Comprehensive Study to improve flood management by combining traditional flood damage reductions measures with nontraditional measures that include floodplain management concepts. The Comprehensive Study is examining policy issues that affect flood management and is seeking opportunities to integrate environmental restoration with flood damage reduction measures.

The Comprehensive Study will develop and begin to implement master plans within a watershed framework that will increase flood protection and improve the ecosystem or major rivers and tributaries in the Central Valley. Because this study is the first system-wide evaluation of the flood management systems in the Central Valley, it represents a change in how projects are identified, selected, and implemented.

The study will contribute directly toward meeting the goals of the Levee System Integrity Program in the Delta. The Comprehensive Study is part of the No Action Alternative.

Long-Term Management Strategy (U.S. Environmental Protection Agency/Corps/SWRCB/Regional Water Quality Control Board/Bay Conservation and Development Commission). Coastal managers have long expressed concern about environmental threats of disposing large volumes of sediments in ecologically sensitive areas. The long-range goals of the Long-Term Management Strategy (LTMS) are to reduce disposal in the estuary and to find beneficial uses for the dredged material. The LTMS already has resulted in designation of a deep ocean disposal site 50 miles offshore of San Francisco that is an ecologically superior alternative to disposal in the estuary itself. Since use of the ocean disposal site began in late 1995, over 4 million cubic yards of dredged material have been diverted from disposal in the Bay, and overall Bay disposal has dropped from historical averages of about 6 million cubic yards annually, to approximately 2.5 million cubic yards.

However, this is the short-term approach until beneficial use projects can be initiated. Dredged material can be reused in a variety of ways, including levee maintenance and stabilization, and restoration of habitat such as tidal wetlands. Using clean sediments from dredging projects, the LTMS agencies have participated in pilot levee maintenance projects and have constructed the Sonoma Baylands wetland restoration project. LTMS is now considering other projects and other ways of beneficially reusing dredged material. A specific policy of the LTMS is to pursue habitat restoration projects that are consistent with habitat goals and plans worked out in other venues, including the Program. Of particular interest are the cost-sharing opportunities of working with the Corps and other dredgers who must pay for the dredging in any event. These parties can provide the clean material to restoration projects much more efficiently than the restoration project could acquire the material.

Program and LTMS agencies will coordinate during Program implementation on potential joint levee construction and habitat restoration projects.

Vernalis Adaptive Management Plan (Reclamation/USFWS). The May 1995 WQCP contained water quality and flow objectives pertaining to the San Joaquin River basin. The member agencies of the San Joaquin River Group Authority release water to meet the required Vernalis Adaptive Management Plan (VAMP) flow. The member agencies that are making water available under their water rights have filed change petitions with the SWRCB pursuant to water code Sections 1707 and 1735 to change the place of use and purpose of use of their water rights in order to protect their water as it makes its way to Vernalis. The SWRCB held hearings on the change petitions as part of its Bay-Delta Water Rights hearing. In an effort to refine the science for the flow objective, the San Joaquin River interests collaborated to identify feasible actions that would protect the river's fish resources and implement the SWRCB's flow objectives. This collaboration led to the proposed scientifically based adaptive fishery management plan known as the VAMP. The VAMP will provide protective measures for fall-run chinook salmon and will gather scientific information on survival of salmon smolts through the Delta. The VAMP will be implemented through experimental flows on the San Joaquin River and export pumping rates with a temporary fish barrier on Old River during the 1-month period each year, from approximately April 15 to May 15. Additional attraction flows are targeted for October.

The VAMP includes proposed water acquisition in the form of a pulse flow at Vernalis during the April and May period, and other flows identified to meet anadromous fish flow objectives. VAMP flows should have beneficial effects for Delta smelt. Water will be acquired from willing sellers by Reclamation on the San Joaquin River and its tributaries.

The San Joaquin River Group Authority, Reclamation, and the USFWS adopted a final EIS/EIR for the San Joaquin River Agreement (SJRA). Reclamation issued an ROD. The EIS/EIR for the SJRA realized that because of the infinite combinations of hydrology and the uncertainty of the source of additional water, long-term environmental analysis could not be completed for the additional water. The acquisition of additional water will take place on an as-needed basis. In March 1999 and again in March 2000, environmental assessments were released for additional water acquisition for meeting VAMP flow objectives. The March 2000 Environmental Assessment/Initial Study was rescinded as there was no need to proceed with the action. The VAMP will directly contribute to meeting the restoration goals of the Ecosystem Restoration Program.

Category III. The Bay-Delta Accord included a commitment to develop and fund nonflow-related ecosystem restoration activities to improve the health of the Bay-Delta ecosystem. This funding source

and commitment is commonly referred to as "Category III." The Category III Steering Committee was formed to administer previous rounds of Category III funding. In 1996, the administration function for Category III funds was shifted to CALFED's Restoration Coordination Program, which receives input from the Ecosystem Roundtable, the BDAC, and the general public. The Ecosystem Roundtable is a subcommittee of BDAC specifically created to provide input from a broad cross section of stakeholder interests to the Restoration Coordination Program.

Actions funded under the Restoration Coordination Program are selected for their benefits to the long-term Program. These actions are consistent with any alternative configuration and provide early implementation benefits. This implementation also provides valuable information that can be used to adaptively manage the system. Actions funded through the Restoration Coordination Program must have appropriate environmental documentation, be justified independently of the Program, and must not prejudice the ultimate decision on the Program. As the CALFED long-term Program nears completion, the priorities and project selection process have been revised to ensure consistency with the Strategic Plan for Ecosystem Restoration (Strategic Plan), the Ecosystem Restoration Program objectives, and priority actions to pursue in Stage 1.

By June 1999, the Restoration Coordination Program had received more than 800 proposals and had funded 195 projects, for a total of approximately $228 million. Types of projects funded include fish screens, fish ladders, land acquisition, habitat restoration, and focused research and monitoring that were designed to provide information to improve future restoration efforts. The Restoration Coordination Program also has the responsibility of improving coordination among fish and wildlife restoration programs in the Central Valley to ensure that Category III programs and projects are well integrated with other restoration programs and are consistent with the long-term Ecosystem Restoration Program and the Strategic Plan.

Other Actions

California 4.4 Plan (Colorado River Board). The rights of seven states (including California) and Mexico to use Colorado River water is governed by a series of agreements, treaties, laws, and court decisions—collectively referred to as the "Law of the River." California is entitled to 4.4 MAF of water in a normal year. Agriculture has a right to 3.8 MAF out of the 4.4 MAF, or nearly 90% of California's normal-year entitlement. The balance goes to The Metropolitan Water District of Southern California (MWD), which operates the Colorado River Aqueduct to deliver water to urban users.

Historically, California has used more water than its normal-year entitlement. California's additional use has been made possible through its ability to use water not used by Arizona and Nevada, and recently "surplus" water. In 1997, the Colorado River provided about 5.2 MAF of the 8.4 MAF of water used for agriculture and urban uses in southern California. The Secretary of the Interior has directed California to devise a plan to live within its 4.4-MAF entitlement during years in which surplus water is not available and when Arizona and Nevada are using their full apportionment. Both Arizona and Nevada are approaching full use of their respective normal-year apportionment. The Secretary of Interior has made water available pursuant to surplus declarations since 1996.

The Secretary of the Interior has advised California that, absent a plan on how the state can live within its entitlement, the Secretary will be less likely in the future to make water available to California above

that normal-year entitlement. If California has an acceptable plan for living within its entitlement, the Secretary could make additional water available to the state through water surplus declarations.

The Colorado River Board, with assistance from the Director of DWR, is responsible for developing the California plan. The Board's latest draft plan, entitled "California's Colorado River Water Use Plan" (dated May 11, 2000), includes the following major components—all of which are focused on changes in the use, supply, or transfer of Colorado River water. The plan relies on a variety of firm and nonfirm conservation and transfer programs, conjunctive use programs, and water banking. These measures include inter-state storage agreements and revising the river's reservoir operations as provided for in the plan. Adoption of these measures likely would require approvals or other actions by the Secretary of the Interior.

If California were to live within its 4.4-MAF normal-year entitlement today, the immediate impact would fall mostly on MWD because almost all of the allocation to California above its normal-year entitlement now goes to urban users serviced by MWD. The Program has assumed that the plan will not lead to additional demand on Delta water because Delta demands are limited by existing SWP contracts.

Imperial Irrigation District and San Diego County Water Authority Water Transfer. Depending on local conditions, San Diego County obtains from 75 to 95% of its water from MWD, which imports water from the Colorado River and northern California. The San Diego County Water Authority (SDCWA) has negotiated an agreement for the long-term transfer of conserved water from the Imperial Irrigation District (IID) to the San Diego region. Under the negotiated contract, IID and its agricultural customers would conserve water and sell it to the SDCWA for at least 45 years. Either agency may extend the contract for another 30 years beyond the initial term. Deliveries in the first year of the contract would total 20 TAF and increase annually in 20-TAF increments until they reach a maximum of 200 TAF. The two agencies may agree to transfer an additional 100 TAF per year after year 10.

This agreement could play a significant role in helping the Colorado River Board develop a plan that allows California to live within its 4.4-MAF normal-year water entitlement from the Colorado River. The Program has assumed that this agreement will not change demand for Bay-Delta water because Bay-Delta demands are limited by the existing SWP contracts.