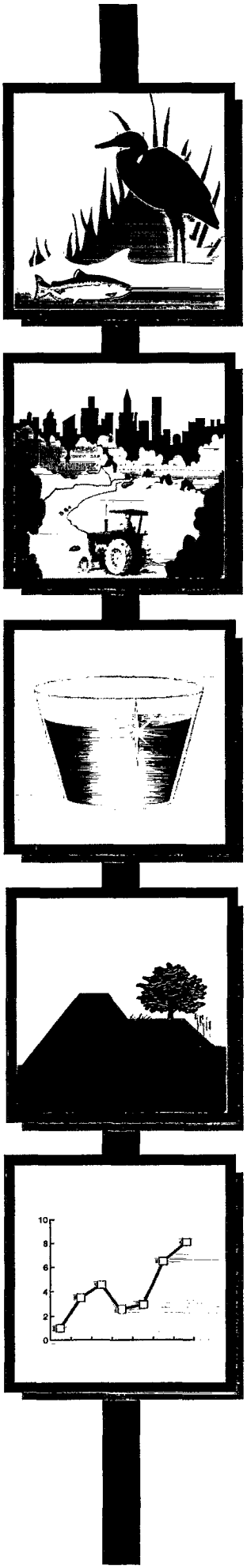

CALFED
BAY-DELTA
PROGRAM

Attachment 1
California Environmental Quality Act Requirements

August 28, 2000

CALIFORNIA ENVIRONMENTAL QUALITY ACT REQUIREMENTS

CEQA FINDINGS OF FACT

I. Introduction

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I. INTRODUCTION

The State and Federal CALFED Agencies prepared a joint programmatic environmental impact study/environmental impact report to analyze the impacts of approving the CALFED Bay-Delta Program. As a joint document, it was prepared in compliance with both the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"). The California Resources Agency is the State lead agency pursuant to CEQA.

CEQA states that a project shall not be approved if it would result in a significant environmental impact, or if feasible mitigation measures or feasible alternatives can avoid or substantially lessen the impact. Only when there are specific economic, social, or other considerations which make it infeasible to substantially lessen or avoid an impact can a project with significant impacts be approved. Pub. Resources Code Section 21000, *et seq.*

These findings, adopted by the Secretary for Resources of the California Resources Agency ("Secretary"), describe the potentially significant environmental impacts analyzed in the CALFED Bay-Delta Final Programmatic EIS/EIR (Programmatic EIS/EIR or EIS/EIR) and make one or more of the following findings for each of the potentially significant environmental impacts identified in the EIS/EIR.

1. Changes or alternatives which avoid or substantially lessen the significant environmental effects as identified in the Final Programmatic EIS/EIR have been required or incorporated into the project, or

2. Such changes or alternatives are within the responsibility and jurisdiction of another public agency. Such changes have been adopted by such other agency or can and should be adopted by such other agency, or

3. Specific economic, social or other considerations make infeasible the mitigation measures or project alternatives identified in the EIS/EIR.

In addition, these findings include the project description, an explanation of the programmatic nature of this EIS/EIR, a discussion of the cumulative and growth-inducing impacts, the mitigation monitoring plan, and a statement of overriding considerations, each of which is adopted by the Secretary.

II. PROJECT DESCRIPTION

To understand the nature of the project for purposes of CEQA, it is important to bear in mind the genesis and purpose of the CALFED Bay-Delta Program ("Program" or "CALFED Program"). The San Francisco Bay/Sacramento-San Joaquin Delta estuary (Bay-Delta) is the largest estuary on the West Coast and is a major source of habitat for a wide range of wildlife and fisheries. It is also the source of drinking water and irrigation water for California's two largest water distribution systems, the federal Central Valley Project (CVP) and California's State Water Project (SWP), as well as other smaller water diverters. These diversions, along with increased population pressures throughout California, the presence of introduced species, water pollution, and numerous other factors have had a serious impact on the fish and wildlife resources in the Bay-Delta estuary, which in turn have led to restrictions on water operations and exports pursuant to the State and Federal Endangered Species Acts.

Disagreement on how to manage these competing demands and protect the Bay-Delta resources have increasingly taken the form of protracted litigation and legislative battles; as a result, progress on virtually all water-related issues has become mired, approaching gridlock. The CALFED Program was established to reduce conflicts in the system and provide a solution that competing interests could support by solving problems in ecosystem quality, water quality, water supply reliability, and levee and channel integrity. The Program seeks to do this by developing a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. This plan is set forth in the EIS/EIR. Thus, the approval of the long-term, multi-stage plan which is the CALFED Program, including the eight program elements designed to achieve its four primary objectives concurrently, is the project for purposes of the Programmatic EIS/EIR.

The Program includes broad approaches to guide the formulation of project-specific actions that may be implemented in the future, with additional environmental documentation and project permit details to be considered as the individual projects included within the scope of the Program are proposed and considered for approval. Neither the project description nor the EIS/EIR include detailed descriptions of these actions, and this EIS/EIR is not intended to be used to authorize these project-specific actions.

CALFED's Objectives and Solution Principles. To determine the best way to fulfill its mission, CALFED undertook to address the problems of the Bay-Delta system concurrently and comprehensively within each of four resource categories: ecosystem quality, water quality, water supply reliability, and levee system integrity. CALFED's primary objectives, developed as part of the early planning process with stakeholders and affected agencies, are identified below.

- **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.

The problems and possible solutions in each of these categories are linked physically, ecologically, and socioeconomically. In the past, most efforts to improve water supply reliability or water quality, improve ecosystem health, or maintain and improve Delta levees focused on a single resource category. A project that focuses on a single problem within the Delta may be more manageable but is likely to have only limited success. Projects designed to solve a problem within one resource category often do so by expending or harming resources in other resource categories. For example, projects to improve water supply reliability may degrade ecosystem health and vice versa. The solution to a problem in one resource category may thus exacerbate problems in others. When this happens, conflicts regarding the use and management of resources within the Delta are not reduced and may actually be intensified. Consequently, independent, narrowly focused projects have been ineffective in addressing conflicts in the Delta.

The CALFED Program took a broader approach. To acknowledge clearly that the problems in the four resource categories within the Bay-Delta system are interrelated and should be addressed concurrently and comprehensively, CALFED developed six solution principles in consultation with cooperating agencies, stakeholders, and interested public members. The solution principles are identified below.

- **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.

The CALFED mission, the primary objectives, and these solution principles were used to measure the overall acceptability of alternatives for detailed consideration in the EIS/EIR. The Program considered, combined and refined over 100 preliminary alternative approaches. Eventually, the CALFED Agencies selected four alternatives together with the No Action Alternative to evaluate in the EIS/EIR. The alternatives selection process is more fully described in Common Response 5 of Volume I, Response to Comments Technical Appendix, and in Section IX of these CEQA Findings.

No long term plan for management of a system as complex as the Bay-Delta can predict exactly how the system will respond to efforts, or foresee events such as earthquakes, climate change, or the introduction of new species to the system. Adaptive management acknowledges the need to adapt actions as conditions change and as the agencies learn more about the system and how it responds. In essence, adaptive management calls for designing and monitoring actions such that they improve the understanding of the system while at the same time improving the system itself. Adaptive management is an essential part of implementing every CALFED Program element.

The Preferred Program Alternative meets these objectives and the solution principles, and carries out the project in a manner that includes the ability to apply adaptive management principles within the framework of the plan, over the 25-30 year planning period.

Preferred Program Alternative

The Preferred Program Alternative consists of a set of broadly described programmatic actions which set the long-term, overall direction of the 30-year CALFED Program. The description is programmatic in nature, intended to help agencies and the public make decisions on broad methods to meet program purposes. The Preferred Program Alternative is made up of the Levee System Integrity Program, Water Quality Program, Ecosystem Restoration Program, Water Use Efficiency Program, Water Transfer Program, Watershed Program, Storage and Conveyance.

Actions described are intended to take place in an integrated framework and not independently of one another. While each program element is described individually, it is understood that only through coordinated, linked, incremental investigation, analysis and implementation can we effectively resolve problems in the Bay-Delta system.

Levee System Integrity Program. The focus of the Levee System Integrity Program is to improve levee stability to benefit all users of Delta water and land. Actions described in this program element protect water supply reliability by maintaining levee and channel integrity. Levee actions will be designed to provide simultaneous improvement in habitat quality (consistent with the Ecosystem Restoration Program goals), which will indirectly improve water supply reliability. Levee actions also protect water quality, particularly during low flow conditions when a catastrophic levee breach would draw salt water into the Delta.

There are five main parts to the levee program plus Suisun Marsh levee rehabilitation work:

- Delta Levee Base Level Protection Plan - Improve and maintain existing Delta levee system stability to meet the Army Corps of Engineers PL 84-99 levee standard.
- Delta Levee Special Improvement Projects - Enhance flood protection for key islands that provide statewide benefits to the ecosystem, water supply, water quality, economics, infrastructure, etc.
- Delta Levee Subsidence Control Plan - Implement current best management practices (BMPs) to correct subsidence adjacent to levees and coordinate research to quantify the effects and extent of inner-island subsidence.
- Delta Levee Emergency Management and Response Plan - The emergency management and response plan will build on existing State, Federal, and local agency emergency management programs.
- Delta Levee Risk Assessment - Perform a risk assessment to quantify the major risks to Delta resources from floods, seepage, subsidence and earthquakes, evaluate the consequences, and develop recommendations to manage the risk.
- Suisun Marsh Levees - Evaluate, and where appropriate, rehabilitate Suisun Marsh levees.

Water Quality Program. The CALFED Program is committed to achieving continuous improvement in the quality of the waters of the Bay-Delta System with the goal of minimizing ecological, drinking water and other water quality problems. Improvements in water quality will result in improved ecosystem health, with indirect improvements in water supply reliability. Improvements in water quality also increase the utility of water, making it suitable for more uses and reuses.

The Water Quality Program includes the following actions:

- Drinking water parameters - Reduce the loads and/or impacts of bromide, total organic carbon (TOC), pathogens, nutrients, salinity, and turbidity through a combination of measures that include source reduction, alternative sources of water, treatment, storage and if necessary, conveyance improvements such as a screened diversion structure (up to 4000 cfs) on the Sacramento River between Hood and Georgiana Slough. The Conveyance section of this document includes a discussion of this potential improvement.

- Pesticides - Reduce the impacts of pesticides through (1) development and implementation of BMPs, for both urban and agricultural uses; and (2) support of pesticide studies for regulatory agencies, while providing education and assistance in implementation of control strategies for the regulated pesticide users.

- Organochlorine pesticides - Reduce the load of organochlorine pesticides in the system by reducing runoff and erosion from agricultural lands through BMPs.

- Trace metals - Reduce the impacts of trace metals, such as copper, cadmium, and zinc, in upper watershed areas near abandoned mine sites. Reduce the impacts of copper through urban storm water programs and agricultural BMPs.

- Mercury - Reduce mercury levels in rivers and the estuary by source control at inactive and abandoned mine sites.

- Selenium - Reduce selenium impacts through reduction of loads at their sources and through appropriate land fallowing and land retirement programs.

- Salinity - Reduce salt sources in urban and industrial wastewater to protect drinking and agricultural water supplies, and facilitate development of successful water recycling, source water blending, and groundwater storage programs. Salinity in the Delta will be controlled both by limiting salt loadings from its tributaries, and through managing seawater intrusion by such means as using storage capability to maintain Delta outflow and to adjust timing of outflow, and by export management.

- Turbidity and sedimentation - Reduce turbidity and sedimentation, which adversely affect several areas in the Bay Delta and its tributaries.

- Low dissolved oxygen - Reduce the impairment of rivers and the estuary from substances that exert excessive demand on dissolved oxygen.

- Toxicity of unknown origin - Through research and monitoring, identify parameters of concern in the water and sediment and implement actions to reduce their impacts to aquatic resources.

Ecosystem Restoration Program. The goal of the Ecosystem Restoration Program 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. In addition, the Ecosystem Restoration Program, along with the water management strategy, is designed to achieve or contribute to the recovery of listed species found in the Bay-Delta and, thus, achieve goals of the Multi-Species Conservation Strategy (MSCS). Improvements in ecosystem health will reduce the conflict between environmental water use and other beneficial uses, and allow more flexibility in water management decisions.

The Ecosystem Restoration Program identifies programmatic actions designed to restore, rehabilitate, or maintain important ecological processes, habitats, and species within 14 ecological management zones. Implementation of these programmatic actions will be guided by six goals presented in the Strategic Plan for Ecosystem Restoration. Nearly 100 restoration objectives have been developed which are directly linked to one of the six goals. Each objective further defines the restoration approach for each ecological process, habitat, species or ecosystem stressor. One to several restoration targets have been developed for each objective to set more specific or quantified restoration levels.

Long-term implementation of the Ecosystem Restoration Program will be guided by the adaptive management approach described in the Strategic Plan for Ecosystem Restoration. This approach to restoration will require review by an ecosystem restoration science review panel and will rely on information developed in the Science Program.

Representative Ecosystem Restoration Program actions include:

- Protecting, restoring, and managing diverse habitat types representative of the Bay-Delta and its watershed.
- Acquiring water from sources throughout the Bay-Delta's watershed to provide flows and habitat conditions for fishery protection and recovery.
- Restoring critical in-stream and channel-forming flows in Bay-Delta tributaries.
- Improving Delta outflow during key periods.
- Reconnecting Bay-Delta tributaries with their floodplains through the construction of setback levees, the acquisition of easements, and the construction and management of flood bypasses for both habitat restoration and flood protection.
- Developing assessment, prevention and control programs for invasive species.
- Restoring aspects of the sediment regime by relocating in-stream and floodplain gravel mining,

and by artificially introducing gravels to compensate for sediment trapped by dams.

- Modifying or eliminating fish passage barriers, including the removal of dams, construction of fish ladders, and construction of fish screens that use the best available technology.
- Targeting research to provide information that is needed to define problems sufficiently, and to design and prioritize restoration actions.

Water Use Efficiency Program. The Water Use Efficiency Program includes actions to assure efficient use of existing and any new water supplies developed by the Program. Efficiency actions can alter the pattern of water diversions and reduce the magnitude of diversions, providing ecosystem benefits. Efficiency actions can also result in reduced discharge of effluent or drainage, improving water quality.

The Water Use Efficiency Program will build on the work of the existing Agricultural Water Management Council process and the California Urban Water Conservation Council process, supporting and supplementing those processes through planning and technical assistance and through targeted financial incentives (both loans and grants). The Water Use Efficiency Program has identified potential recovery of currently irrecoverable water losses of over 1.4 million acre-feet of water annually by 2020 as a result of CALFED actions. Early in Stage 1, CALFED will identify measurable goals and objectives for its urban and agricultural water conservation program, water reclamation programs and managed wetlands programs.

Water conservation-related actions include:

- Implement agricultural and urban conservation incentives programs to provide grant funding for water management projects that will provide multiple benefits which are cost-effective at the state-wide level, including improved water quality and reduced ecosystem impacts.
- Identify, in region-specific strategic plans for agricultural areas, measurable objectives to assure improvements in water management.
- Expand State and Federal programs to provide increased levels of planning and technical assistance to local water suppliers.
- Work with the Agricultural Water Management Council (AWMC) to identify appropriate agricultural water conservation measures, set appropriate levels of effort, and certify or endorse water suppliers that are implementing locally cost-effective feasible measures.
- Work with the California Urban Water Conservation Council (CUWCC) to establish an urban water conservation BMP certification process and set appropriate levels of effort in order to ensure that water suppliers are implementing cost-effective feasible measures.
- Help urban water suppliers comply with the Urban Water Management Planning Act.
- Identify and implement practices to improve water management for wildlife areas.

- Gather better information on water use, identify opportunities to improve water use efficiency, and measure the effectiveness of conservation practices.
- Conduct directed studies and research to improve understanding of conservation actions.

Water recycling actions include:

- Help local and regional agencies comply with the water recycling provisions in the Urban Water Management Planning Act.
- Expand State and Federal recycling programs to provide increased levels of planning, technical, and financing assistance (both loans and grants) and to develop new ways of providing assistance in the most effective manner.
- Provide regional planning assistance that can increase opportunities for the use of recycled water.

Water Transfer Program. The Water Transfer Program proposes a framework of actions, policies, and processes that, collectively, will facilitate water transfers and the further development of a state-wide water transfer market. The framework also includes mechanisms to help provide protection from third party impacts. A transfers market can improve water availability for all types of uses, including the environment. Transfers can also help to match water demand with water sources of the appropriate quality, thus increasing the utility of water supplies.

The Water Transfer Program will include the following actions and recommendations:

- Establish a California Water Transfer Information Clearinghouse to provide a public informational role. The clearinghouse would 1) ensure that information regarding proposed transfers is publicly disclosed and, 2) perform on-going research and data collection functions to improve the understanding of water transfers and their potential beneficial and adverse effects.
- Require water transfer proposals submitted to the DWR, Reclamation, or the State Water Resources Control Board to include analysis of potential groundwater, socio-economic, or cumulative impacts as warranted by individual transfers.
- Streamline the water transfer approval processes currently used by DWR, Reclamation, and the State Water Resources Control Board. This would include clarifying and disclosing current approval procedures and underlying policies as well as improving the communication between transfer proponents, reviewing agencies, and other potentially affected parties.
- Refine quantification guidelines used by water transfer approving agencies when they are reviewing a proposed water transfer. This will include resolving issues between stakeholders

and approving agencies regarding the application of current agency-based quantification criteria.

- Improve the accessibility of State and Federal conveyance and storage facilities for the transport of approved water transfers.
- Clearly define carriage water requirements and resolve conflicts over reservoir refill criteria such that transfer proponents have a clear understanding of the implications of these requirements.
- Identify appropriate assistance for groundwater protection programs through interaction with CALFED Agencies, stakeholders, the Legislature and local agencies. This is intended to assist local agencies in the development and implementation of groundwater management programs that will protect groundwater basins in water transfer source areas.
- Establish new accounting, tracking, and monitoring methods to aid instream flow transfers under California Water Code Section 1707.

Watershed Program. The goal of the CALFED Watershed Program is to promote locally led watershed management activities and protections that contribute to the achievement of CALFED goals for ecosystem restoration, water quality improvement, and water supply reliability. The Watershed Program will accomplish these tasks by providing financial and technical assistance to local community watershed programs.

The Watershed Program includes the following elements:

- Build local community capacity to assess and manage watersheds affecting the Bay-Delta system.
- Develop local watershed assessment and management plans.
- Fund development and implementation of specific watershed conservation, maintenance, and restoration actions identified in these plans.
- Facilitate and improve coordination and assistance among government agencies and local watershed organizations.
- Develop watershed program performance measures and monitoring protocols consistent with the CALFED Science Program.
- Support resource conservation education at the local watershed level, and provide organizational and administrative support to watershed programs.
- Identify the watershed functions and processes that are relevant to CALFED goals and objectives, and provide examples of watershed activities that could improve these functions and processes.

Storage. Groundwater and surface water storage can be used to improve water supply reliability, provide water for the environment at times when it is needed most, provide flows timed to maintain water quality, and protect levees through coordinated operation with existing flood control reservoirs.

Decisions to construct groundwater or surface water storage will be predicated on compliance with all environmental review and permitting requirements, and maintaining balanced implementation of all CALFED Program elements. Subject to these conditions, new groundwater and surface water storage will be developed and constructed, together with aggressive implementation of water conservation, recycling, an improved water transfer market, and habitat restoration, as appropriate to meet CALFED Program goals. During Stage 1, through the water management strategy (including the Integrated Storage Investigation), CALFED will continue to evaluate surface water and groundwater storage, identify acceptable project-specific locations, and initiate permitting, NEPA and CEQA documentation, and construction if all conditions are satisfied.

The total volume of new or expanded surface water and groundwater storage evaluated in the EIS/EIR ranges up to 6 million acre feet, and surface storage facility locations being considered are located in the Sacramento and San Joaquin Valley and in the Delta. Those surface storage sites that will be pursued in Stage 1 are discussed in Section 2.2.5. New groundwater programs could be implemented statewide.

Conveyance. The Preferred Program Alternative employs a through-Delta approach to conveyance. Modifications in Delta conveyance will result in improved water supply reliability, protection and improvement of Delta water quality, improvements in ecosystem health, and reduced risk of supply disruption due to catastrophic breaching of Delta levees. The Preferred Program Alternative through-Delta conveyance facility actions include:

- Construction of a new screened intake at Clifton Court Forebay with protective screening criteria.
- Construction of either a new screened diversion at Tracy with protective screening criteria; and/or an expansion of the new diversion at Clifton Court Forebay to meet the Tracy Pumping Plant export capacity.
- Implementation of the Joint Point of Diversion (see EWA Operating Principles in Attachment 2) for the SWP and CVP, and construction of interties.
- Construction of an operable barrier at the head of Old River to improve conditions for salmon migrating up and down the San Joaquin River.
- Construction of operable barriers taking into account fisheries, water quality and water stage needs in the south Delta.
- Operational changes to the SWP operating rules to allow export pumping up to the current physical capacity of the SWP export facilities.

Under the Preferred Program Alternative, north Delta improvements include:

- Studying and evaluating a screened diversion facility on the Sacramento River with a range of diversion capacities up to 4,000 cfs as a measure to improve drinking water quality in the event that the Water Quality Program measures do not result in continuous improvements toward CALFED drinking water goals. Potential diversion sites between and including Hood and Georgiana Slough will be considered as part of this evaluation.

  The diversion facility on the Sacramento River likely would include a fish screen, pumps, and a channel between the Sacramento and Mokelumne Rivers. The diversion facility on the Sacramento River is an action to be considered only after three separate assessments are satisfactorily completed: first, a thorough assessment of Delta Cross Channel (DCC) operation strategies and confirmation of continued concern over water quality impacts from DCC operations; second, a thorough evaluation of the technical viability of a diversion facility; and third, satisfactory resolution of the fisheries concerns about a diversion facility. The assessments of the Delta Cross Channel and the diversion facility on the Sacramento River will be completed simultaneously. The results of all three of these evaluations will be shared with the Delta Drinking Water Council or its successor and the expert panel evaluating fish impacts of Delta conveyance. If these evaluations demonstrate that a diversion facility on the Sacramento River is necessary to address drinking water quality concerns and can be constructed without adversely affecting fish populations, a decision on siting the facility will be made and permit and environmental review pursued to allow construction as a part of the Preferred Program Alternative.

- Construct new setback levees, dredge and/or improve existing levees along the channels of the lower Mokelumne River system from Interstate 5 downstream to the San Joaquin River.

The Preferred Program Alternative includes a process for determining the conditions under which any future additional conveyance facilities or water management actions would be taken. The process would include:

- An evaluation of how water suppliers can best provide a level of public health protection equivalent to Delta source water quality of 50 parts per billion (ppb) bromide and 3 parts per million (ppm) total organic carbon.

- An evaluation based on two independent expert panels' reports -- one on the Program's progress toward these measurable water quality goals and the second on CALFED's progress toward ecosystem restoration objectives, with particular emphasis on fisheries recovery.

III. PROGRAMMATIC EIS/EIR

During extensive public scoping meetings, the CALFED Agencies determined that the wide array of potential actions, the broad geographic area affected, the length of time for implementation, and the inter-related nature of the resources and goals for the CALFED Program indicated that a programmatic level environmental review would allow for the broadest disclosure and improve the opportunity for decision makers and the public to consider alternatives. Identifying and analyzing potential future combined effects of a long-term, multi-stage proposal allows a greater opportunity to design actions that avoid, minimize, or mitigate identified impacts. This Programmatic EIS/EIR, or "program EIR" as used in CEQA, will be used to tier more detailed environmental documents for project-specific actions during Phase III, following approval of the CALFED Program.

The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity which is described in the EIR. "An EIR on a project such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan should focus on the secondary effects that can be expected to follow from the adoption, or amendment, but the EIR need not be as detailed as an EIR on the specific construction projects that might follow." CEQA Guidelines Section 15146. See also *Rio Vista Farm Bureau Center v. County of Solano* (1992) 5 Cal.App.4th 351, 371.

The alternatives examined in the EIS/EIR represent basic approaches to concurrently solving the four areas of critical concern in the Bay-Delta. Included within each of those approaches are a multitude of potential project-specific activities which are consistent with the Program, but for which details are not yet known, and about which individual decisions remain to be made. The EIS/EIR presents information at a broad planning level of detail, including descriptions covering regional and solution area impacts. In essence, the overall and long-term environmental consequences of the potential proposed actions at the end of the CALFED Program's 30-year time span are described.

As a program-level document, the EIS/EIR does not analyze project-specific impacts of future projects at specific locations and therefore cannot predict with certainty which impacts will occur and what project-specific mitigation measures will be appropriate for mitigating those impacts in these second-tier projects. Consequently, the EIS/EIR identifies mitigation strategies, which are an array of actions that could be used to avoid or minimize the types of environmental impacts anticipated as a result of the CALFED Program. These mitigation strategies will provide the basis to tailor more specific mitigation measures for individual projects, and for purposes of CEQA, they serve as mitigation measures at a programmatic level.

As the Program is implemented and additional information is developed on the effectiveness of ecosystem restoration actions and mitigation measures, the lead agency for subsequent tiered environmental documents may also develop and consider additional project-specific mitigation

measures. By implementing the Program in stages, these second-tier projects can also be designed to minimize environmental impacts identified as the result of this new information.

At the project-specific level of environmental review, the lead agency will review the site characteristics, size, nature, and timing of proposed actions to determine whether the impacts of the specific projects are potentially significant or can be avoided or mitigated to a less-than-significant level. However, since it is not possible to precisely assess the project-specific impacts or potential for mitigation of project-level impacts as part of this programmatic analysis, the EIS/EIR treats these impacts as potentially significant at a programmatic level. Where it is anticipated that feasible mitigation measures may not be available to avoid or reduce these impacts to a less-than-significant level, based on currently available information, this document treats these impacts at the programmatic level as potentially significant and unavoidable, even where this conclusion is not certain. Future review in tiered environmental documents will be needed to determine the impacts of specific actions and appropriate mitigation for project-specific actions.

This EIS/EIR is structured to be used as a tiering document. Individual, second-tier projects can use this analysis as a basis from which to supplement and refine the level of detail and can incorporate by reference relevant provisions in the EIS/EIR. Tiering will assist the agencies in focusing on issues that are ripe for decision at each stage of environmental review and to exclude from consideration issues that have already been decided or that are not ready for decision. Second-tier documents will be prepared to concentrate on issues specific to the individual project being implemented and site(s) chosen for the action before construction can be initiated. The environmental review and initial studies for project-specific, second-tier projects can incorporate by reference the discussions in the program EIR, and "concentrate on the environmental effects which (a) are capable of being mitigated, or (b) were not analyzed as significant effects on the environment in the prior environmental impact report." Pub. Resources Code Section 21068.5.

The thresholds of significance for most of the environmental resources discussed in this impact analysis are described in qualitative terms and cover a broader spectrum of impacts than would be included in a project-specific, project-level analysis. The thresholds used in this EIS/EIR are intended to identify potentially significant impacts at a programmatic level and to provide guidance for developing significance criteria for second tier environmental review. For future analyses, the measure of significance will vary depending on the nature and type of the proposed actions, the site characteristics where the actions take place, and how they affect the existing conditions at the time of the proposed actions.

Some mitigation strategies and measures may cause other adverse environmental impacts at the same time that they mitigate impacts addressed in this EIS/EIR. At this programmatic level of analysis, it is impractical to analyze the specific impacts or the measures needed to mitigate those secondary impacts. During review of project-specific proposals, the additional impacts created by the application

of mitigation strategies, if any, will be analyzed, and further measures added as necessary to avoid or reduce those impacts.

Where a second-tier project involves impacts that are addressed in the EIS/EIR, the mitigation strategies adopted in these findings will be used by the lead agencies as a basis to formulate project-level mitigation measures and enforcement programs. Because all the potential actions and impacts for tiered projects cannot be anticipated at a programmatic level, each lead agency needs to select those strategies applicable to the impacts associated with the specific location and type of action. The lead agencies and the Science Program of the CALFED Program will monitor the mitigation used for second-tier projects. The commitment by the CALFED Agencies to apply the relevant mitigation strategies, and to develop and enforce mitigation measures pursuant to those strategies, is included in the Record of Decision for the CALFED Program.

IV. ADMINISTRATIVE RECORD

For the purposes of CEQA and the findings set forth below, the administrative record for the Secretary's decision on the CALFED Program consists of the following documents:

1. The March 1998 Draft Programmatic EIS/EIR, including all appendices, technical reports, documents cited in the Draft Programmatic EIS/EIR, letters submitted on the Draft, and public hearing transcripts;

2. The June 1999 Draft Programmatic EIS/EIR, including all appendices, technical reports, documents cited in the Draft Programmatic EIS/EIR, letters submitted o the Draft, and public hearing transcripts;

3. The July 2000 Final Programmatic EIS/EIR, including all appendices and technical reports, comments and responses to comments, and documents cited in the Final Programmatic EIS/EIR;

4. All notices issued by the Resources Agency and Federal lead agencies to comply with CEQA, NEPA, or with any other law governing the processing and approval of the Program;

5. Relevant CALFED State and Federal agency reports, studies, decisions, official opinions, modeling data, informal communications, planning documents and other environmental impact reports or studies used in preparation of the Programmatic EIS/EIR;

6. Other relevant State, Federal and local agency reports, studies, decisions, official opinions, modeling data, informal communications, planning documents and other environmental impact reports or studies used in preparation of the Programmatic EIS/EIR;

7. Any EIRs, EISs, and other environmental documentation prepared by CALFED Agencies and other public agencies for other actions and programs relevant to the Programmatic EIS/EIR;

8. All documents submitted by members of the public and non-privileged documents submitted by public agencies in connection with the Programmatic EIS/EIR on the Program;

9. All relevant reports, documentary or other evidence submitted at workshops, public meetings and public hearings on the Program;

10. Minutes and meeting packets of all Bay-Delta Advisory Committee meetings, and its subcommittees and workgroups;

11. Minutes and verbatim transcripts of all public hearings held by the CALFED Program on the Programmatic EIS/EIR;

12. All non-privileged, relevant reports, memoranda, maps, letters and other planning documents prepared by the Program staff, consultants, and CALFED Agencies for the development of the Programmatic EIS/EIR;

13. Scientific, technical and other professional judgment, published and unpublished articles, and other information relied upon by CALFED staff and participants in CALFED workshops and informal communications;

14. Any other written materials relevant to the CALFED Program's compliance with CEQA and NEPA or to the Resources Agency's decision on the project; and

15. The Bay-Delta Accord, Accord Extensions, and the Principles for Agreement, the Record of Decision for this Program dated August 28, 2000, and other relevant agreements regarding the CALFED Program.

The custodian of the documents comprising the administrative record for the Secretary's decision is Steve Ritchie, the Acting Executive Director of the CALFED Bay-Delta Program, or his successor. The location of the administrative record is the office of the CALFED Bay-Delta Program, 1416 Ninth Street, Suite 1155, Sacramento, California 95814.

V. MITIGATION MONITORING PLAN

The monitoring process adopted by the CALFED Agencies carries out Section 21081.6 of CEQA that requires public agencies to adopt a reporting or monitoring program whenever a project or program is approved that includes mitigation measures identified in an environmental document. Projects and activities that implement the CALFED Preferred Program Alternative will be monitored through the Science Program to ensure that issues and mitigation strategies in this EIS/EIR process are adequately considered and used to develop mitigation measures for second-tier projects. CALFED Agencies have committed to use this mitigation monitoring plan at the project level for any second-tier projects within the scope of this EIS/EIR. If and when a new governing agency with authority to carry out CALFED Program projects is created by legislation, this policy would apply to that new agency as well. This commitment is part of the Record of Decision for the CALFED Program and signed by each of the CALFED Agencies, including the Resources Agency.

Projects and activities implementing the Preferred Program Alternative will undergo future environmental analysis as required by NEPA and CEQA tiering from this EIS/EIR. In order to qualify for CALFED funding, any implementing project must demonstrate its compliance with this mitigation monitoring plan. As part of these second-tier environmental reviews, the lead agency for each of these projects will use the mitigation strategies identified in the program document as starting points to determine their applicability to a specific project and to develop additional mitigation measures for significant adverse impacts identified in the project-specific analysis. Because all the potential actions and impacts for tiered projects cannot be anticipated at a programmatic level, each project needs to select those strategies applicable to the impacts associated with the specific location and type of action. For purposes of CEQA, the mitigation strategies in the Final EIS/EIR also serve as mitigation measures at a programmatic level.

The NEPA/CEQA monitoring process includes review, guidance, and reporting components. The CALFED Agencies will prepare a checklist of the mitigation strategies (Section VI) to provide guidance to lead agencies preparing environmental documents that tier from the programmatic EIS/EIR. The lead agencies for second tier documents will note which applicable programmatic mitigation strategies are being adopted and used for mitigation measures and explain why other are not. The lead agencies will provide a schedule for implementing the adopted mitigation measures, and for reviewing the implementation of those measures. The lead agencies will provide a written report periodically, but at least once a year to the CALFED chief scientist as to the progress in implementing the mitigation measures and efficacy thereof. A summary of this information will be included in the annual report to the Governor, the Secretary of the Interior, Congress, the California Legislature, Federal and State government agencies, stakeholders, and the general public.

VI. FINDINGS ON SPECIFIC IMPACTS AND MITIGATION MEASURES

A. Findings on Specific Impacts and Adoption of Mitigation Measures

Chapters 5, 6 and 7 of the EIS/EIR set forth environmental effects of the Preferred Program Alternative that would be potentially significant or significant in the absence of mitigation measures. These impacts are set forth below, along with mitigation measures adopted, that will avoid or substantially lessen those potentially significant or significant impacts. Also set forth are certain significant impacts that cannot be avoided or reduced to a less than significant level even with the adoption of all feasible mitigation measures proposed in the EIS/EIR. In adopting these findings and mitigation measures, the Secretary also adopts a Statement of Overriding Considerations setting forth the economic, social and other benefits of the CALFED Program that will render these significant impacts acceptable.

The Secretary is not required to adopt mitigation measures or adopt policies as part of the Program for impacts that are less than significant.

In the following sections, the Secretary summarizes the significant impacts of the Program and describes whether the impacts remain significant or are reduced to less than significant with all adopted feasible mitigation measures. The Secretary also identifies those mitigation measures that are within the jurisdiction and responsibility of other agencies. Subsection B below lists those mitigation measures which were suggested by commentators but are not adopted or are rejected as infeasible for technical, social, economic or other reasons.

Section 5.3 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts On Water Quality Associated with the Preferred Program Alternative

Impact 1. Releases of inorganic and organic suspended solids into the water column and turbidity resulting from increased erosion during construction, dredging, or drainage of flooded lands.

Total suspended solids (TSS) is the primary contaminant of concern that would be affected by the construction activities of the Program. Soil particles released from construction activities increase TSS content of Delta waters. The Ecosystem Restoration Program, Levee System Integrity Program, and Water Quality Program actions would release quantities of soil, including nutrients and organic matter, into the water column during in-water and waterside construction, and flowing water would dislodge soil particles from new levees and wetlands during the initial water-soil contact period.

Short-term effects on water quality from construction of surface water reservoirs would result from ground disturbance and consequent increased soil erosion rates. Groundwater storage projects could use injection wells or spreading basins that involve some ground disturbance or increased soil erosion. Earth moving and dredging associated with construction of Delta facilities could result in increased sediment loads caused by erosion and sediment disturbance and releases of nutrients and natural organic matter into the water column. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less-than-significant.

Mitigation Strategies:

1. Use best construction and drainage management practices to avoid transport of soils and sediments into waterways.
2. Use cofferdams to construct levees and channel modifications in isolation from existing waterways.
3. Use sediment curtains to contain turbidity plumes during dredging.
4. Schedule ground disturbing construction during the dry season.

Impact 2. Releases of toxic substances, such as pesticides, selenium, and heavy metal residues, into the water column during construction and dredging and other Program actions.

Construction activities associated with the Program are expected to discharge soil particles and the associated release of toxicants in the vicinity of construction sites. Toxic substances could be released during the demolition of levees because some of the older levees were built with dredge spoils. Waterside construction activities for the Levee System Integrity Program and Ecosystem Restoration Program could result in short-term effects on water quality if toxic substances contained in old levees or in channel sediments are released during waterside levee work or dredging.

Dredging may expose mercury-laden sediments and may mobilize other toxic elements. Earth moving and dredging associated with construction of Delta facilities could result in releases of toxic substances. Disturbances to previously farmed soils could release residual agricultural pesticides, including organochlorinated pesticides, mercury, nutrients, and other chemicals that may adversely affect water quality. In addition, creating shallow water habitat in areas that would receive mercury from receiving water sources has the potential to increase methyl mercury levels in the ecosystem. Storing water in surface reservoirs may mobilize trace elements, particularly in the deeper parts of the reservoirs where dissolved oxygen concentrations may become depressed. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies

1. Use best construction and drainage management practices to avoid transport of soils and sediments into waterways.
2. Use cofferdams to construct levees and channel modifications in isolation from existing waterways.
3. Schedule ground disturbing construction during the dry season.
4. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.
5. Identify and investigate issues regarding beneficial reuse of dredged material, including conducting core sampling and analysis of proposed dredged areas, and implement engineering solutions to avoid or prevent environmental exposure to toxic substances after dredging.
6. Continue the studies concerning reuse of beneficial Bay dredge material in the Delta for potential water quality impacts related to salinity, metals mobilization, and other environmental and health hazards.
7. Investigate all potential sources of borrow and the cost effectiveness of each source's use for levee rehabilitation and construction, including the use of sediment traps as a source of borrow.
8. Prepare a borrow plan that includes future costs and options for obtaining adequate quantities of borrow needed for implementation of the Levee System Integrity Program.
9. Use sediment curtains to contain turbidity plumes during dredging.
10. Cap exposed toxic sediments with clean clay/silt and protective gravel.

<u>Impact 3. Net increases in salinity if evaporation increases converting irrigated cropland to wetlands.</u>

Replacing certain irrigated crops with wetlands could result in a net increase in water salinity because evapotranspiration would increase. However, the conversion from irrigated crops to wetlands also reduces salinity due to the reduction or elimination of applied salts. Evaporation may also slightly reduce Delta outflow, resulting in a minimal increase in salinity from the intrusion of saltwater from the

ocean. Preliminary modeling shows that certain ERP actions, such as reconstructing islands and restoring tidal marshes in the North Bay, may have substantial beneficial impacts on salinity during peak salinity conditions. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Release additional, higher-quality water from enlarged or additional off-stream storage, or from additional groundwater storage, to decrease salinity levels and prevent intrusion.
2. Release additional water from storage in existing reservoirs or groundwater basins.
3. Restore additional riparian vegetation to increase shading of channels and reduce evaporation.
4. Reconstruct islands and restore tidal marshes in the North Bay.

Impact 4. Increased electrical conductivity (a measure of salinity) of water in the Delta.

Export or storage of additional water could slightly reduce net Delta outflow at certain times of the year, increasing salinity intrusion. This impact is considered less than significant.

If the diversion facility on the Sacramento River is constructed, no significant adverse impacts related to salinity are expected.

If the diversion facility on the Sacramento River is not constructed, the Preferred Program Alternative could increase electrical conductivity (EC - a relative measure of salinity) of water in the central Delta, in the south Delta, and in the San Joaquin River in the west Delta. This impact is considered significant.

Note: The programmatic scope and level of uncertainty of the water quality modeling make it impossible to predict at a finite, localized level whether this increase in EC could result in a significant impact. However, for purposes of this programmatic analysis, this impact was assumed to be significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Release additional water from enlarged or additional off-stream storage, or from additional groundwater storage.
2. Release additional water from storage in existing reservoirs or groundwater basins.
3. Relocate diversion intakes to locations with better source water quality.

4. Modify water conveyance operations, including DCC and south Delta operations. CALFED Program implementation will occur in phases to permit new information gained from studies and monitoring to influence changes in facility design and operations.

Impact 5. Increases of TOC in river water caused by the increased contact between flowing or ponded water and vegetation or peat soils that would result from conversion of agricultural lands to wetlands and from actions in other Program elements.

Replacing irrigated cropland with wetlands could change the concentration of total organic carbon (TOC) in river water, but it is currently unknown whether it would increase or decrease. If the Ecosystem Restoration Program causes a reduction in TOC concentrations, there could be an adverse effect on biological productivity in the Delta if carbon is the limiting ecological factor. The reduction of TOC would improve the suitability of Delta waters as a drinking water source. If TOC concentrations are increased then the biological productivity may be increased and the suitability of water for drinking water will decrease. Storing water in reservoirs on Delta islands could increase TOC production from the peat soils in the Delta. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Treat wastewater at the source, such as Delta drains, upgrade water treatment processes at drinking water treatment plants and/or provide treatment at the point of use (consumer's tap).
2. Use innovative, cost-effective disinfection processes (for example, UV irradiation, and ozonation, in combination with other agents) that form fewer or less harmful DBPs.
3. Separate water supply intakes from discharges of agricultural and urban runoff.
4. Apply agricultural and urban BMPs, and treat drainage from lands with concentrations of potentially harmful constituents to reduce contaminants. Treat drainage from agricultural lands underlain by peat soils to remove TOC.
5. Relocate diversion intakes to locations with better source water quality.

Impact 6. Increased water temperatures and resultant decreased dissolved oxygen concentrations due to the increased residence time of water in the Delta and from Program actions.

Barriers in the south Delta would partially block Old River, Grant Line Canal, and part of the Middle River. The barriers would diminish tidal flow, reducing connectivity to other Delta channels and altering basic hydraulic features that affect sediment and nutrient movement and water quality

conditions. Increases in water temperature and reduction of dissolved oxygen could occur. Fisheries and aquatic impacts are addressed in Section 6.1.

Temperatures could increase or decrease in the Sacramento River if inflows of warmer or cooler water occur from new off-stream reservoirs. Diversion of water to off-stream reservoirs would reduce flows downstream of the diversion and could increase water temperatures. Water transfers could affect water quality through changes to river flow and water temperature. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Release additional water from enlarged storage or additional off-stream storage, or from additional groundwater storage.
2. Release additional water from storage in existing reservoirs or groundwater basins.
3. Operate storage facility operations to maintain the frequency, magnitude, and duration of flows necessary to maintain and restore downstream water quality and habitat.
4. Restore additional riparian vegetation to increase the shading of channels and decrease evaporation.
5. Utilize the criteria in the Water Transfer Program, in conjunction with existing legal constraints on water transfers, to protect against adverse effects on water quality due to water transfers. The criteria for future water transfer proposals include:

    - Transfers must not harm fish and wildlife resources and their habitats.

<u>Impact 7. Decreases in in-stream water quality if water use efficiency measures or water transfers reduce diluting flows.</u>

Increased water use efficiency could adversely affect water quality if the volume of municipal wastewater or agricultural tailwater discharged into a stream is reduced but the mass load of salts and other contaminants in the discharge remains the same. Water transfers could affect water quality primarily through changes to river flow and water temperatures. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Improve treatment levels provided at municipal wastewater treatment plants to upgrade the quality of the constituents of concern discharged to receiving waters in order to compensate for the reduction in dilution caused by improved water use efficiency. Improved salt management of wastewater inputs to treatment plants could reduce salt concentrations in discharges.

2. Release additional water from enlarged or additional off-stream surface storage, or from additional groundwater storage.
3. Release additional water from storage in existing reservoirs or groundwater basins.
4. Utilize the criteria in the Water Transfer Program, listed above under Impact 6, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

Impact 8. Increases in concentrations of constituents of concern if water transfers reduce in-stream flows and deplete river assimilative capacities.

Water transfers could increase constituents of concern if river flows are reduced, increasing water temperatures and depleting assimilative capacities. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Improve treatment levels provided at municipal wastewater treatment plants to upgrade the quality of the constituents of concern discharged to receiving waters in order to compensate for the reduction in dilution caused by improved water use efficiency. Improved salt management of wastewater inputs to treatment plants could reduce salt concentrations in discharges.
2. Release additional water from enlarged or additional off-stream surface storage, or from additional groundwater storage.
3. Release additional water from storage in existing reservoirs or groundwater basins.
4. Use existing river channels for water transfers and time the transfers to avoid adverse water quality impacts.
5. Utilize the criteria in the Water Transfer Program, described above under Impact 6, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

Impact 9. Increase in methylation of mercury in constructed shallow-water habitat.

Mercury contaminants in sediments could become available in the water column as a result of implementing the ERP. Creating shallow-water habitat in areas that would receive mercury from surface water sources has the potential to increase methyl mercury levels in the ecosystem. Under anaerobic conditions, such as after creating a wetland, mercury is methylated and thus mobilized in the water column. Methyl mercury in the water column would be available to fish and other members of

the food chain. Fisheries and aquatic impacts are addressed in Section 6.1. Public health impacts are addressed in Section 7.12. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategy:

1. Test for mercury in soils and locate constructed shallow-water habitat away from sources of mercury until methods for reducing mercury in water and sediments are implemented.

Impact 10. Degradation of surface water by the transfer of poorer quality groundwater.

Water pumped from the ground would contain less suspended solids, more dissolved solids, and generally higher nitrates than the source water. If the water is used directly by municipalities or for agricultural use, its suitability for use would be reduced somewhat by its increased mineral concentrations. If the water is pumped into a surface stream during low-flow periods, it could substantially reduce water temperatures and could result in increased biological productivity due to the presence of nitrate. Groundwater impacts are addressed in Section 5.4. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Release additional water from enlarged or additional off-stream storage, or from additional groundwater storage.
2. Release additional water from storage in existing reservoirs or groundwater basins.
3. Provide funding and assistance to develop new groundwater basin plans or expanding existing groundwater basin management plans, including defining objectives, project boundaries, responsibilities, operation and maintenance specifications and procedures, and conditions under which corrective actions are taken.
4. Reduce or discontinue groundwater pumping.
5. Monitor and test groundwater wells and aquifers.
6. Utilize the criteria in the Water Transfer Program, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers. The criteria for future water transfer proposals include:
   - Water rights of all legal water users must not be impaired.
   - Transfers must not cause overdraft or degradation of groundwater basins, or impair correlative rights of overlying users.

Impact 11. Changes in natural flow regimes in areas where new surface storage is built.

Changes in streamflow would result from releases from, and diversions to, surface storage. Typically, surface water reservoirs would be used to store abundant spring flows for later release and use in dry months or years. Diversion of water to off-stream reservoirs would reduce flows downstream of the diversion and could increase water temperatures. Off-stream reservoirs would alter the hydrology of intermittent or small perennial streams on which they are built. Spring flows would be reduced or eliminated compared to unimpaired flows, and flow in naturally dry periods would be increased. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategy:

1. Operate storage facility to maintain the frequency, magnitude, and duration of flows necessary to maintain and restore downstream water quality and habitat.

Impact 12. Surface storage innundation of toxic material.

Storing water in surface reservoirs may mobilize trace elements found in the substrate, particularly in the deeper parts of the reservoirs where dissolved oxygen concentrations may become depressed. For example, mercury compounds are present in rocks and sediment in the water column in some parts of the Sacramento Valley. Under certain conditions, these compounds may be converted into biologically available methyl mercury. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Avoid innundation or design solutions to innundation of toxic materials, such as covering with an engineered cap.
2. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.

Section 5.4 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Groundwater Associated with the Preferred Program Alternative

Impact 1. Changes in groundwater levels.

Groundwater transfers—or surface water transfers based on groundwater substitution—could result in significant adverse impacts on third-party groundwater users, with adverse effects in the source water area. Such impacts might include lower groundwater levels and higher pumping costs, impacts on vegetation dependent on groundwater, streamflow depletions, or, in extreme cases, losses of existing wells.

Agricultural water conservation, including a reduction in deep percolation or applied irrigation or reduction in seepage from irrigation conveyance facilities, can result in local reductions in groundwater recharge. Conservation or reuse of treated wastewater, otherwise applied to spreading basins for recharge of local groundwater resources, could reduce the amount of artificial recharge.

If improperly managed, groundwater storage programs could result in significant adverse impacts associated with changes in groundwater levels, including higher pumping costs, reduced well yields, impacts on vegetation dependent on groundwater, and streamflow depletions. During extended drought periods, unforeseen groundwater level declines could occur as a result of overpumping in the storage facility area, and adverse impacts on third-party users could be significant. In extreme cases, third-party users could lose the use of some wells as a result of groundwater quality degradation and lower groundwater levels. Third-party impacts are also discussed in Sections 7.2 and 7.14.

In-Delta storage could increase hydraulic head at the storage site. The increase in the hydraulic head, greater wetted surface area, and larger volume of water in the in-Delta reservoir relative to the rivers could cause substantial groundwater underflow toward the tracts on the opposite banks of the island storage. Leakage could occur through the unlined canal transferring water from the diversion facility on the Sacramento River, waterlogging the soils along the alignment of the canal. Seepage could also be caused by the flooding of Delta islands for habitat restoration and from altered levee vegetation management practices. Related seepage impacts to soils, agricultural land, and flood control are addressed in Sections 5.5, 7.1, and 7.8. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Create additional groundwater or surface water storage facilities to improve water supply reliability and decrease overdraft.
2. Support voluntary transfers of water from basins with excess supplies.
3. Purchase water rights from willing sellers (including transferring water rights between sectors—for example, from agricultural to municipal uses).

4. Support local groundwater management planning that reduces overdraft and third-party impacts.
5. Implement conservation measures to reduce demand.
6. Integrate the Ecosystem Restoration Program floodplain restoration efforts with setback levees.
7. Allow water levels to increase periodically.
8. Support local projects to recharge aquifers through injection wells (confined aquifers) or percolation ponds (unconfined aquifers).
9. Support local efforts in developing new groundwater basin management plans or expanding existing groundwater basin management plans, including defining objectives, project boundaries, responsibilities, operation and maintenance specifications and procedures, and conditions under which corrective actions are taken.
10. Design new levees and improve existing levees to withstand hydraulic stresses and seepage from flooding Delta islands.
11. Monitor water-level conditions on islands adjacent to flooded Delta islands.
12. Install interception wells at in-Delta storage facilities to control seepage.
13. Control seepage through pumping and other appropriate measures.
14. Line conveyance canals to prevent seepage.
15. Temporarily remove recharge systems from service to avoid effects associated with high water tables.
16. Utilize the criteria in the Water Transfer Program, in conjunction with existing legal constraints on water transfers, to protect against adverse effects on groundwater due to water transfers. The criteria for future water transfer proposals include:

    - Water rights of all legal water users must not be impaired..
    - Transfers must not cause overdraft or degradation of groundwater basins, or impair correlative rights of overlying users.

Impact 2. Increased demand for groundwater supplies.

Surface water transfers based on groundwater substitution may increase the demand for groundwater supplies.

Agricultural efficiency improvements may lead some growers to switch to groundwater as a more reliable source of high-quality water. This could result in groundwater declines and land subsidence.

Additional in-stream flow requirements could result in reduced frequency of meeting agricultural, and to some extent, municipal and industrial demands in the San Joaquin River Region. This would put increased pressure on groundwater resources to supply the unmet demand and could result in significant adverse impacts on groundwater resources in some basins during low runoff years. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Create additional groundwater or surface water storage facilities to improve water supply reliability and decrease overdraft.
2. Support voluntary transfers of water from basins with excess supplies.
3. Purchase water rights from willing sellers (including transferring water rights between sectors—for example, from agricultural to municipal uses).
4. Implement conservation measures to reduce demand.
5. Support local and regional efforts to increase water supplies from recycling.
6. Develop alternative water supplies.
7. Support local projects to recharge aquifers through injection wells (confined aquifers) or percolation ponds (unconfined aquifers).
8. Utilize the criteria in the Water Transfer Program, listed above under Impact 1, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

Impact 3. Increased groundwater overdraft.

Groundwater transfers—or surface water transfers based on groundwater substitution—could result in significant adverse impacts on third-party groundwater users, with adverse effects in the source water area. Such impacts might include lower groundwater levels and higher pumping costs, or, in extreme cases, losses of existing wells.

Agricultural efficiency may lead some growers to switch to groundwater as a more reliable source of high-quality water. This could result in groundwater overdraft.

If improperly managed, groundwater storage programs could result in significant adverse impacts associated with overdrafting the aquifer, increased pumping costs, reduced well yields, and streamflow depletions. During extended drought periods, unforeseen groundwater level declines could occur as a result of overpumping in the storage facility area, and adverse impacts on third-party users could be significant. In extreme cases, third-party users could lose the use of some wells as a result of groundwater quality degradation and lower groundwater levels. Third-party impacts are also discussed in Sections 7.2 and 7.14. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Support local groundwater management planning that reduces overdraft and third-party impacts, including reduction or discontinuance of groundwater pumping.
2. Support increased regulations regarding new and existing domestic wells and septic systems.
3. Monitor and test groundwater wells and aquifers.
4. Limit new septic tank systems in vulnerable areas.
5. Support local projects to recharge aquifers through injection wells (confined aquifers) or percolation ponds (unconfined aquifers).
6. Support local agencies in distributing groundwater pumping over a wide region rather than to a concentrated area to minimize drawdown of the aquifer.
7. Support local agencies in developing new groundwater basin management plans or expanding existing groundwater basin management plans, including defining objectives, project boundaries, responsibilities, operation and maintenance specifications and procedures, and conditions under which corrective actions are taken.
8. Utilize the criteria in the Water Transfer Program, listed above under Impact 1, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

Impact 4. Increased land subsidence.

Groundwater transfers—or surface water transfers based on groundwater substitution—could result in significant adverse impacts on third-party groundwater users, with adverse effects in the source water area. Such impacts might include lower groundwater levels, land subsidence, or, in extreme cases, losses of existing wells.

Agricultural efficiency may lead some growers to switch to groundwater as a more reliable source of high-quality water. This could result in groundwater declines and possibly land subsidence.

If improperly managed, groundwater storage programs could result in significant adverse impacts associated with overdrafting the aquifer, including land subsidence. During extended drought periods, unforeseen groundwater level declines could occur as a result of overpumping in the storage facility area, and adverse impacts on third-party users could be potentially significant, including the loss of use of some wells. Third-party impacts are also discussed in Sections 7.2 and 7.14. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Support local groundwater management planning that reduces overdraft and third-party impacts, including reduction or discontinuation of groundwater pumping.

2. Support increased regulations regarding new and existing domestic wells and septic systems.
3. Monitor and test groundwater wells and aquifers.
4. Limit new septic tank systems in vulnerable areas.
5. Allow water levels to increase periodically.
6. Import new soil (including dredged spoil) to raise land surface.
7. Support local projects to recharge aquifers through injection wells (confined aquifers) or percolation ponds (unconfined aquifers).
8. Support local agencies in distributing groundwater pumping over a wide region rather than to a concentrated area to minimize drawdown of the aquifer.
9. Support local agencies in developing new groundwater basin management plans or expanding existing groundwater basin management plans, including defining objectives, project boundaries, responsibilities, operation and maintenance specifications and procedures, and conditions under which corrective actions are taken.
10. Utilize the criteria in the Water Transfer Program, listed above under Impact 1, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

Impact 5. Increased degradation of groundwater quality from contaminant movement, salt-water intrusion, or naturally poor-quality water drawn into the aquifer.

Groundwater transfers—or surface water transfers based on groundwater substitution—could result in significant adverse impacts on third-party groundwater users, with adverse effects in the source water area. Such impacts might include degradation to groundwater quality, resulting in losses of existing wells in extreme cases.

Agricultural water conservation, including a reduction in deep percolation or applied irrigation or reduction in seepage from irrigation conveyance facilities, can result in local reductions in groundwater recharge. The loss of recharge would not necessarily be accompanied by a decrease in loading of salts and agricultural chemicals since irrigation systems generally are operated to ensure that these chemicals are leached through the root zone of plants.

Adverse impacts on groundwater may result from artificial recharge systems and from in lieu recharge, in which surface water is substituted for groundwater use so that natural recharge of the aquifer can occur. Differences in the chemical or biological properties of the recharge water relative to the water in the targeted aquifer (such as dissolved oxygen concentration, pH, mineral content, temperature, microbial population, and other parameters) could result in significant adverse impacts. For example, introduction of nutrients can cause existing dormant microbial populations to bloom. New, undesirable microbial populations may be introduced. Changes in chemistry can cause precipitation or solution of minerals. In some locations, recovery of water levels could remobilize residual chemical contaminants that have been left behind by falling water levels. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Support voluntary transfers of water from basins with excess supplies.
2. Support increased regulations regarding new and existing domestic wells and septic systems.
3. Monitor and test groundwater wells and aquifers.
4. Limit new septic tank systems in vulnerable areas.
5. Allow water levels to increase periodically.
6. Reduce or discontinue groundwater pumping.
7. Support local projects to recharge aquifers through injection wells (confined aquifers) or percolation ponds (unconfined aquifers).
8. Support local agencies in distributing groundwater pumping over a wide region rather than to a concentrated area to minimize drawdown of the aquifer.
9. Treat extracted groundwater at the well head.
10. Dilute poor-quality groundwater with higher quality water.
11. Support local efforts in developing new groundwater basinplans or expanding existing groundwater basin management plans, including defining objectives, project boundaries, responsibilities, operation and maintenance specifications and procedures, and conditions under which corrective actions are taken.
12. Temporarily remove recharge systems from service to avoid effects associated with high water tables.
13. Utilize the criteria in the Water Transfer Program, listed above under Impact 1, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

Impact 6. Impacts from groundwater recharge and storage system operations.

If improperly managed, groundwater storage programs could result in significant adverse impacts associated with overdrafting the aquifer, including land subsidence, water quality degradation, increased pumping costs, reduced well yields, impacts on vegetation dependent on groundwater, and streamflow depletions. During extended drought periods, unforeseen groundwater level declines could occur as a result of overpumping in the storage facility area, and adverse impacts on third-party users could be significant. In extreme cases, third-party users could lose the use of some wells as a result of groundwater quality degradation and lower groundwater levels. Third-party impacts are also discussed in Sections 7.2 and 7.14.

Differences in the chemical or biological properties of the recharge water relative to the water in the targeted aquifer (such as dissolved oxygen concentration, pH, mineral content, temperature,

microbial population, and other parameters) could result in significant adverse impacts. For example, introduction of nutrients can cause existing dormant microbial populations to bloom. New, undesirable microbial populations may be introduced. Changes in chemistry can cause precipitation or solution of minerals. In some locations, recovery of water levels could remobilize residual chemical contaminants that have been left behind by falling water levels.

In-Delta storage could increase hydraulic head at the storage site. The increase in the hydraulic head, greater wetted surface area, and larger volume of water in the in-Delta reservoir relative to the rivers could cause substantial groundwater underflow toward the tracts on the opposite banks of the island storage. Leakage could occur through the unlined canal transferring water from the diversion facility on the Sacramento River, waterlogging the soils along the alignment of the canal. Related seepage impacts to soils, agricultural land, and flood control are addressed in Sections 5.5, 7.1, and 7.8. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Support local groundwater management planning that reduces overdraft and third-party impacts.
2. Support local and regional efforts to increase water supplies by recycling.
3. Support increased regulations regarding new and existing domestic wells and septic systems.
4. Monitor and test groundwater wells and aquifers.
5. Limit new septic tank systems in vulnerable areas.
6. Allow water levels to increase periodically.
7. Support local projects to recharge aquifers through injection wells (confined aquifers) or percolation ponds (unconfined aquifers).
8. Support local agencies in distributing groundwater pumping over a wide region rather than to a concentrated area to minimize the drawdown of the aquifer.
9. Dilute poor-quality groundwater with higher quality water.
10. Support local agencies in developing new groundwater basin management plans or expanding existing groundwater basin management plans, including defining objectives, project boundaries, responsibilities, operation and maintenance specifications and procedures, and conditions under which corrective actions are taken.
11. Design new levees and improve existing levees to withstand hydraulic stresses and seepage from flooding Delta islands.
12. Monitor water-level conditions on islands adjacent to flooded Delta islands.
13. Install interception wells at in-Delta storage facilities to control seepage.
14. Control seepage through pumping and other appropriate measures.
15. Line conveyance canals to prevent seepage.

16. Temporarily remove recharge systems from service to avoid effects associated with high water tables.
17. Utilize the criteria in the Water Transfer Program, listed above under Impact 1, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

Section 5.5 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts On Geology and Soils Associated with the Preferred Program Alternative

Impact 1. Conversion of agricultural land soils for levee system construction and potential for erosion on outboard slope of levees.

The use of agricultural soils for levee system construction could result in significant adverse changes to soils in the affected areas. Agricultural soils would be covered where new setback levees are constructed. Conversion of agricultural land is addressed in Section 7.1. Soil erosion outboard of the levees could be reduced by habitat restoration and sediment deposition measures, but would be subject to erosion during floods. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Protect flooded Delta island inboard levee slopes against wind and wave erosion with vegetation, soil matting, or rock.
2. Protect exposed soils with mulches, geotextiles, and vegetative ground covers during and after project construction activities in order to minimize soil loss.
3. Implement erosion control measures and bank stabilization projects.
4. Increase sediment deposition and provide substrate for new habitat by planting terrestrial and aquatic vegetation.
5. Re-use dredged materials to reduce or replace soil loss.
6. Investigate the cost effectiveness and safety of using sediment traps as a source of borrow.
7. Leave crop stubble from previous growing season in place while fallowing and employ cultivation methods that will cause the least amount of disturbance in order to minimize erosion of surface soils.
8. Prepare and implement best construction management plans.
9. Prepare and implement a water quality and soils monitoring program.
10. Prepare and implement construction mitigation plans.

Impact 2. Increases in local subsidence from potential increased reliance on groundwater use.

An increased reliance on groundwater could result in localized subsidence from depletion of groundwater resources. On-farm efficiency improvements from the Water Use Efficiency Program could lead to increased reliance on groundwater due to irrigation needs and secondary use issues. Highly efficient irrigation requires more frequent water deliveries, some of which may not be met from surface water sources, and impoundment of tailwater leaves less surface water available to secondary users. Such users may turn to alternative sources, such as groundwater. An increased reliance on

groundwater could result in localized subsidence from depletion of groundwater resources. This impact is significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Monitor groundwater levels and subsidence in areas of increased reliance on groundwater resources.
2. Minimize and avoid direct groundwater transfers or groundwater substitution transfers from regions: 1) experiencing long-term overdraft, 2) where subsidence historically has occurred, or 3) where local extensometers indicate that subsidence rates are increasing.
3. Utilize the criteria in the Water Transfer Program, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers. The criteria for future water transfer proposals include:

    - Transfers must not cause overdraft or degradation of groundwater basins, or impair correlative rights of overlying users.

Impact 3. Increases in wind and soil erosion and in soil salinity due to fallowed agricultural lands.

Increases in soil erosion and soil salinity may result from Water Transfer Program and Water Use Efficiency Program actions. Erosion and reduction of soil cover may occur on land idled as a result of water transfers. Soil salinity may increase on fallowed land if salts are not flushed from the soil. Soil salinity could increase if irrigation water is replaced with lower quality water from groundwater substitution. Water use efficiency measures may reduce the volume of water necessary to flush the salinity from the soil. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Protect exposed soils with mulches, geotextiles, and vegetative ground covers during and after project construction activities in order to minimize soil loss.
2. Leave crop stubble from previous growing season in place while fallowing and employ cultivation methods that will cause the least amount of disturbance in order to minimize erosion of surface soils.
3. Limit the salinity of replacement water, relative to local conditions, in water transfers.
4. Ensure that the volume of irrigation water used is sufficient to flush accumulated salts from the root zone.

Impact 4. Increased construction-related short-term soil erosion, and increased sediment deposition and soil compaction.

Direct, indirect, and construction-related activities associated with the Ecosystem Restoration Program, Levee System Integrity Program, Water Quality Program and Watershed Program could alter or displace soils in the immediate vicinity of activities. Compaction of soil by heavy equipment during construction would temporarily affect the physical characteristics of the soil, including decreasing permeability and increasing runoff. Watershed Program activities could cause short-term soil erosion and increased sediment deposition during the construction of stream and watershed restoration projects or roadway improvements. In addition, reservoir construction could cause increased erosion on areas cleared for storage facilities or access roads. Short-term increases in erosion rates and soil compaction would result from construction of conveyance improvements, including constructing a screened intake, modifying existing channels, and constructing a diversion facility on the Sacramento River. Land disposal of dredged material from channels in the Delta may substantially disturb or disrupt existing soils. Dredging impacts are discussed in Sections 5.3 and 6.2. Conversion of agricultural land is addressed in Section 7.1. During removal of diversion structures, accumulated sediments behind the diversion structure could be released into the stream system, causing increased sediment deposition downstream. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Protect exposed soils with mulches, geotextiles, and vegetative covers during and after construction activities in order to minimize soil loss.
2. Implement erosion control measures and bank stabilization projects.
3. Increase sediment deposition to mitigate erosion effects and provide substrate for new habitat by planting terrestrial and aquatic vegetation.
4. Re-use dredged materials to reduce or replace soil loss.
5. Prepare and implement best construction management plans.
6. Prepare and implement construction mitigation plans.
7. Use cofferdams to construct levees and channel modifications in isolation from existing waterways.
8. Use sediment curtains to contain turbidity plumes during dredging.

Impact 5. Potential changes in downstream geomorphology from enlarging existing storage facilities and other Program actions.

Expansion of existing storage facilities could increase downstream erosion capabilities and change downstream geomorphologic characteristics. This includes the reduction of stream bedload,

especially during high-flow events. Off-stream storage sites placed across minor drainages may diminish downstream flows and reduce sediment transport in local stream channels. Diversions of water to off-stream storage facilities could adversely affect downstream morphology by reducing the magnitude of channel forming flows.

During removal of diversion structures, accumulated sediments behind the diversion structure could be released into the stream system, causing increased sediment deposition downstream. Dredging impacts are discussed in Sections 5.3 and 6.2. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Increase sediment deposition and provide substrate for new habitat by planting terrestrial and aquatic vegetation.
2. Measure channel morphology over time to monitor changes and implement erosion control measures where needed.
3. Re-use dredged materials to reduce or replace soil loss.
4. Operate new storage facilities to minimize sediment trapping and increase sediment transport in rivers and tributaries.
5. Prepare and implement contingency plans for wetland and marshland restoration.
6. Modify storage facility operations to maintain the frequency, magnitude, and duration of flows necessary to maintain and restore downstream habitat.

Impact 6. Ground disturbance, inundation, seepage, and shoreline wind- and wave-generated erosion from new storage facilities and other Program actions.

Wind- and wave-generated erosion along the shoreline of new or expanded reservoirs could increase bank erosion and sedimentation at the site.

Construction of in-Delta storage facilities and associated diversion and conveyance components would result in local ground disturbances and innundation, the extent of which would depend on the type and size of storage, diversion and conveyance facilities constructed, construction methods, and sites selected.

Seepage to adjacent islands could be caused by groundwater underflow toward the tracts on the opposite banks on an in-Delta reservoir. Leakage could occur through the unlined canal transferring water from the diversion facility on the Sacramento River, waterlogging the soils along the alignment of the canal. Leakage could result in a significant adverse impact on water levels in soils adjacent to the canal. Seepage could also be caused by the flooding of Delta islands for habitat restoration and from altered levee vegetation management practices. Related seepage impacts to groundwater, agricultural land, and flood control are addressed in Sections 5.4, 7.1, and 7.8. A significant adverse impact of in-Delta storage would be the loss of prime farmland due to inundation at

the storage site. Agricultural land conversion impacts are discussed in Section 7.1. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Protect exposed soils with mulches, geotextiles, and vegetative ground covers during and after construction activities in order to minimize soil loss.
2. Implement erosion control measures and bank stabilization projects where needed.
3. Increase sediment deposition and provide substrate for new habitat by planting terrestrial and aquatic vegetation.
4. Prepare and implement best construction management plans.
5. Prepare and implement construction mitigation plans.
6. Control boat traffic in order to reduce boat wakes to levels that will not cause levee or bank erosion.
7. Design new levees and improve existing levees to withstand hydraulic stresses and seepage from flooding Delta islands.
8. Monitor water-level conditions on islands adjacent to in-Delta storage.
9. Install interception wells at in-Delta storage facilities to control seepage.
10. Control seepage through pumping and other appropriate measures.
11. Line conveyance canals to prevent seepage.

Section 5.6 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts of Noise Associated with the Preferred Program Alternative

Impact 1. Increased noise from heavy equipment operation during construction.

Restoration projects, including, but not limited to installation of new fish screens at certain diversions in the Delta Region, wetland development and other habitat restoration efforts, and the Watershed Program, create construction-related noise and could impact residents, recreation users, and sensitive wildlife species. In addition, improving the existing levee systems and constructing new levees, as well as dredging, could result in increased construction-related noise levels. Modifying existing filtration plants; developing new pipelines, well fields, and pump stations; and new or modified pumps associated with increasing or decreasing pumping would create construction-related noise levels. Lastly, construction of new filtration and treatment facilities associated with the Water Quality Program would increase noise levels. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Use electrically powered equipment instead of internal combustion equipment where feasible.
2. Restrict the use of bells, whistles, alarms, and horns to safety warning purposes.
3. Design equipment to conform with local noise standards.
4. Locate equipment as far from sensitive receptors as possible.
5. Equip all construction vehicles and equipment with appropriate mufflers and air inlet silencers.
6. Restrict hours of construction to periods permitted by local ordinances.
7. Locate noisy equipment within suitable sound-absorbing enclosures.
8. Erect sound wall barriers or noise attenuation berms between noise generation sources and sensitive receptors.
9. Schedule construction activities to avoid breeding seasons of sensitive species and peak recreating use.
10. Conduct project-specific noise analyses for actions with noise impacts.

Impact 2. Noise from construction-related traffic along major access and haul routes and construction labor force vehicle traffic.

Noise levels could increase from construction-related traffic along major access and haul routes and construction labor force vehicle traffic. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Locate staging and stockpile areas, and supply and construction vehicle routes as far away from sensitive receptors as possible.
2. Establish and enforce construction site and haul road speed limits.
3. Restrict the use of bells, whistles, alarms, and horns to safety warning purposes.
4. Restrict hours of construction to periods permitted by local ordinances.
5. Schedule construction activities to avoid breeding seasons of sensitive species and peak recreating use.
6. Encourage use of public transportation and carpooling for construction workers.
7. Conduct project-specific noise analyses for actions with noise impacts.

Impact 3. Increased noise from facility operation of spillways, pumping generating plants, and switchyards.

Modifying existing filtration plants; developing new pipelines, well fields, and pump stations; and increasing or decreasing pumping would increase operations-related noise. Further, new pumps in storage conveyance systems would result in operations-related noise. Lastly, new filtration and treatment facilities associated with the Water Quality Program would increase operations-related noise. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Use electrically powered equipment instead of internal combustion equipment where feasible.
2. Restrict the use of bells, whistles, alarms, and horns to safety warning purposes.
3. Design equipment to conform with local noise standards.
4. Locate equipment as far from sensitive receptors as possible.
5. Locate noisy equipment within suitable sound-absorbing enclosures.
6. Erect sound wall barriers or noise attenuation berms between noise generation sources and sensitive receptors.
7. Conduct project-specific noise analyses for actions with noise impacts.

Impact 4. Increased noise from automobile or boat traffic associated with recreational use at enlarged reservoirs.

New off-stream and expansion of existing storage could provide additional recreation resources, which could result in an increase in noise from automobile and boat traffic. Transportation impacts are addressed in Section 5.7. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Erect sound wall barriers or noise attenuation berms between noise generation sources and sensitive receptors.
2. Restrict boating speeds or access to areas with sensitive receptors.
3. Conduct project-specific noise analyses for actions with noise impacts.

Impact 5. Increased traffic noise from permanently relocated roadways.

Roads may be closed or permanently relocated due to implementation of the Levee System Integrity Program and construction of storage and conveyance facilities, causing traffic to find an alternate route and increasing the traffic volume and congestion on the new route. Transportation impacts are addressed in Section 5.7. Traffic noise could increase where traffic is redirected. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Erect sound wall barriers or noise attenuation berms between noise generation sources and sensitive receptors.
2. Locate redirected roadways away from sensitive receptors.
3. Conduct project-specific noise analyses for actions with noise impacts.

Section 5.7 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Transportation Associated with the Preferred Program Alternative

Impact 1. Increasing local traffic flows as the public accesses recreational resources at new storage facilities.

New off-stream and expansion of existing storage could provide additional recreation resources, which could result in an increase in local traffic flows. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Expand public transportation resources and local roadways.
2. Locate roadways in areas with fewer conflicts.
3. Design roadways to avoid or minimize traffic congestion.

Impact 2. Changing traffic flows as roads are temporarily rerouted around construction sites.

Restoration activities associated with the Ecosystem Restoration Program, such as wetland development or habitat development on levees, could result in local, short-term changes in traffic flows. Roads that are on or near levees being improved could be affected by levee construction work, and traffic would need to be detoured during construction. During reservoir and facility construction, some roads may require improvement or relocation, and traffic diversion may be required. Detours also may be necessary when facilities intersect with roadways. Highway traffic may be temporarily detoured during construction of bridges or road segments. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Provide convenient and parallel detours to routes closed during construction.
2. Expand public transportation, roads, and highways.
3. Encourage use of public transportation and carpooling for construction workers.

Impact 3. Relocating or permanently closing roads.

Roads may be closed or permanently relocated due to implementation of the Levee System Integrity Program, causing traffic to find an alternate route and increasing the traffic volume and congestion on the new route. In addition, new storage facilities could require relocating some local roads. Possible road relocations and new bridges could involve the long-term rerouting of traffic. If a road was closed and no nearby detour was available, traffic would be rerouted altogether. Constructing a diversion facility could involve relocating several miles of local roads, relocating highways, and constructing new bridges. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:
1. Expand public transportation, roads, and highways.
2. Locate roadways in areas with fewer conflicts.
3. Design roadways to avoid or minimize traffic congestion.
4. Encourage use of public transportation and carpooling for construction workers.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear that this impact can be mitigated to less than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 4. Delays and disruptions resulting from detouring traffic as new roadways and railroad bridges are constructed around storage and conveyance facilities.

New storage facilities could require constructing new roadways and railroad bridges. If the bridge construction takes place on a rail line, it would be necessary to temporarily divert train traffic or alter train schedules. Localized highway traffic impacts could occur if the use of the new roads and bridges directs travel through already congested areas. Reservoir projects would generate additional vehicular traffic on roadways serving project sites during the multi-year construction period. Construction-related traffic would include equipment and supply deliveries, concrete trucks, service vehicles, and construction worker traffic. Increased construction traffic would cause some delays but probably would not preclude the use of county roads. During reservoir and facility construction, some roads may require improvement or relocation, and traffic diversion may be required. Detours also may be necessary when facilities intersect with roadways. Detours could increase travel time and cause delay. If detours substantially affect traffic flows, a portion of the existing traffic could choose an alternate route, further affecting traffic volumes.

Constructing a diversion facility on the Sacramento River could involve relocating several miles of local roads and highways, and constructing new bridges. Traffic would need to be detoured during construction and relocation. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Provide convenient and parallel detours to routes closed during construction.
2. Allow trains to use existing tracks while bridges are being built.
3. Schedule construction at times and seasons to minimize delays.

Impact 5. Adding construction vehicles to existing traffic levels, especially on narrow, two-lane local roads with winding routes.

Dredging operations, levee improvements, storage and conveyance facility construction and other Program actions could substantially affect transportation by creating safety conflicts on roadways. The addition of construction vehicles to existing roadway traffic levels could affect vehicle safety in areas where congestion already exists or on narrow, two-lane local roads with winding routes. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Clearly mark roadway intersections with warnings where visibility is poor in the project vicinity.
2. Schedule construction at times and seasons to minimize conflicts.

Impact 6. Closing two-lane roads to one lane in order to facilitate roadway improvements or relocations associated with the Watershed Program.

Road improvements and deconstruction of roads in upper watershed areas could result in construction impacts on transportation. Traffic may be diverted during construction. If alternative routes are not available, the affected route could be closed to one traffic lane during construction. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Provide convenient and parallel detours to routes closed during construction.
2. Clearly mark roadway intersections with warnings where visibility is poor in the project vicinity.
3. Schedule construction at times and seasons that would minimize delays.

Impact 7. Impeding or blocking patrol or rescue boats in Delta channels where fish barriers and flow control structures are installed.

Fish barriers and flow control structures could interfere with emergency response efforts by impeding or blocking patrol or rescue boats. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Provide boat portage or a stationary jib crane.
2. Relocate boat launch facilities.
3. Relocate emergency access roads.

Impact 8. Creating safety conflicts by operating large, slow-moving dredging equipment on Delta waterways.

The operation of slow-moving dredging equipment on Delta waterways could create safety conflicts for recreational boaters and commercial or rescue craft. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Require contractors to follow appropriate state and federal safety protocols.
2. Coordinate dredging and safety precautions with state and local authorities.

Section 5.8 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts On Air Quality Associated with the Preferred Program Alternative

Impact 1. Direct, short-term air pollutant emissions during construction activities.

Ecosystem Restoration Program activities including installation of new fish screens, wetland development and river channel improvements could cause construction-related air quality impacts. Improvement of existing levee systems and construction of new levees, subsidence reversal activities, and dredging would result in construction-related air quality impacts. Modification of existing filtration plants, development of new pipelines, well fields, and pump stations, and increased pumping activities could result in construction- and operations-related air quality impacts in agricultural and urban environments. Reservoir construction could release pollutants of concern (NO_x, CO, and PM10) at levels exceeding ambient air quality standards for extended periods, thereby potentially contributing significantly to regional air quality degradation. Conveyance facility construction-related pollutants of concern (NO_x, CO, and PM_{10}) may exceed ambient air quality standards for short, intermittent periods during construction but are not expected to result in sufficient quantities to significantly contribute to regional air quality degradation. Air emissions from operation of diesel- and gasoline-powered equipment include O_3 precursors (non-methane organic gas, volatile organic compounds, and NO_x), PM_{10}, CO, and toxic air contaminants. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Set traffic limits on construction vehicles.
2. Maintain properly tuned equipment.
3. Limit the hours of operation or amount of equipment.
4. Regularly water construction sites to control levels of dust in the air.
5. Use soil stabilizers and dust suppressants on unpaved service roadways.
6. Conduct daily contained sweeping of paved surfaces.
7. Limit vehicle idling time.
8. Use alternatively fueled equipment.
9. Require selection of borrow sites that are closest to fill locations.
10. Implement construction practices that reduce generation of particulate matter.
11. Hydoseed and mulch exposed areas.
12. Encourage use of public transportation and carpooling for construction workers.

Impact 2. Fugitive emissions of wind-blown dust.

Temporary land fallowing from water transfers could increase wind erosion if no cover crop or crop residue remains over the topsoil. Increased cultivation from water transfers or improved irrigation efficiency may result in increases in fugitive dust. Fugitive dust emissions could also increase if water transfers or water use efficiency measures result in a shift to crops associated with a drier topsoil. Conversion of land for various Program actions could increase fugitive emissions of wind-blown dust if the land is left as unvegetated, fallowed land. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Regularly water construction sites to control levels of dust in the air.
2. Use soil stabilizers and dust suppressants on unpaved service roadways.
3. Conduct daily contained sweeping of paved surfaces.
4. Require selection of borrow sites that are closest to fill locations.
5. Implement construction practices that reduce generation of particulate matter.
6. Hydroseed and mulch exposed areas.
7. Use cultivation practices that minimize soil disturbance.

Impact 3. Emissions associated with prescribed burning programs.

Prescribed burning programs in the upper and lower watershed areas are potentially significant sources of O_3 precursor emissions and PM_{10} emissions. If Federal land management agencies undertake new prescribed burning programs, the programs may require evaluation for compliance with EPA Clean Air Act conformity regulations. Continuation of existing prescribed burning programs normally would be exempt from CAA conformity requirements. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Coordinate prescribed burning programs with relevant air quality management agencies to ensure that the programs are accounted for in air quality management plans.
2. Implement prescribed burning during favorable weather conditions.

Impact 4. Emissions from increases in equipment use and cultivation, agricultural chemical use, and crop shifting and burning.

Increased farming from water transfers and improved water use efficiency and reliability could result in increased emissions from equipment use and cultivation, agricultural chemical use, and crop shifting and burning. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Maintain properly tuned equipment.
2. Limit the use of agricultural chemicals.
2. Implement alternatives to crop burning including tilling and shallow flooding.
3. Coordinate crop stubble burning with relevant air quality management agencies to ensure that the programs are accounted for in air quality management plans.

Impact 5. Emissions if land use changes lead to higher recreational uses.

Emissions may increase if CALFED Program actions lead to land use changes with increased recreational uses. CALFED Program actions are not expected to result in increased residential or commercial land uses. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Limit the hours of operation or amount of equipment.
2. Follow air basin management plans to avoid or minimize vehicle-related emissions.
3. Restrict the kinds of recreational vehicles or the times of operation for certain off-road vehicles on fallowed agricultural land to limit the amount of fugitive dust.

Impact 6. Emissions from use of fossil fuels or other energy resources associated with pressurized irrigation systems.

Increased use in the agricultural sector of pressurized irrigation systems could create a greater reliance on fossil fuels or other energy sources. The increase could adversely affect air quality either locally (with fossil fuels) or regionally if energy is provided from out-of-region facilities. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Maintain properly tuned equipment.
2. Limit the hours of operation or amount of equipment.
3. Use alternatively fueled equipment.

Impact 7. Indirect air quality impacts from increased power generation to meet Program energy consumption and changes in operation.

Energy use may increase as energy consuming components of the CALFED Program are constructed, implemented, and maintained. Changes in operation could also reduce the amount of hydroelectric power generated. To the extent that Program actions cause significant reduction in hydroelectric generation or increases in project energy consumption without offsetting reduction in other electrical loads, new capacity and energy needs to be obtained to meet the deficit. Because California currently has a shortage of peaking power capacity, new power plants may be needed. Indirect impacts on air quality may occur if new power plants are constructed and operated.

The CALFED Bay-Delta Program does not propose construction of new power plants as part of its Program actions, and thus any impacts would be indirect. The location, number, and type of new power plants is unknown, and will likely be built as a result of demand from a number of other sources. An analysis of impacts from construction impacts would therefore be speculative at this time, and cannot be assessed until project level environmental assessment is undertaken by the appropriate permitting agency at the time a new power plant is proposed.

The level of air quality impacts from new power plants will also depend on the location and type of additional generation, which is not known at this time. These indirect air quality impacts would be dispersed among various air basins, and the level of adverse impacts will depend on the type of plant and the location where they are constructed. Emissions from new generation would be subject to federal, state, and regional air quality requirements at the time they are proposed. Moreover, the California Energy Commission has the authority for permitting power plants that generate 50 MW or more, and as such, has the responsibility to mitigate any significant air quality impacts that remain after permitting requirements are imposed.

The Secretary finds that the indirect air quality emissions associated with any new power plants related to program actions will need to comply with applicable air quality requirements, and therefore are expected to be less than significant. However, to the extent that emissions impacts are not reduced to less than significant levels, the Secretary finds that the responsibility to mitigate these impacts are within the jurisdiction of the Energy Commission and regional air quality districts. Thus, the Energy Commission and these districts can and should adopt these and any necessary project-specific mitigation measures at the time a power plant project is proposed.

Mitigation Strategies:

1. Obtain power from non-emitting sources such as other hydro, solar, and wind sources. This can occur through construction of, or the use of incentives to construct non-emitting power plants. This approach is consistent with state and federal policies related to promoting use of renewable resource type generation as expressed in Public Utility Code Section 381(c) (part of what is commonly referred to as AB 1890) and Executive Order 12902.
2. Utilize the best available control technology for new power production facilities.

Section 6.1 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts On Fisheries and Aquatic Ecosystems Associated with the Preferred Program Alternative

Impact 1. Increased non-native species abundance and distribution to levels detrimental to native species from reestablishment of aquatic areas.

Although shallow water environments will be constructed to provide habitat for native and other desirable fish species, colonization by non-native aquatic plants, such as *Egeria densa*, may alter the structure and reduce habitat value. Newly created habitat may increase the abundance and distribution of carp, inland silverside, or other non-native species that compete with or prey on native species and species with higher economic and social value (for example, chinook salmon, delta smelt, and striped bass). In addition, habitat created by levee setbacks may increase the abundance and distribution of carp, inland silverside, or other non-native species that compete or prey on native species and species with higher economic and social value (for example, chinook salmon, delta smelt, and striped bass). This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:

1. Control undesirable non-native species through measures such as prevention, education, information dissemination, management techniques, and eradication.
2. Coordinate and maximize water supply system operations flexibility consistent with seasonal flow and water temperature needs of desired species.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, it is unclear that this impact can be mitigated to less than significant based on currently available information. The CALFED Agencies have committed to a comprehensive non-native species research and control program (NIS Program). CALFED provided initial funding for this effort to the U.S. Fish and Wildlife Service in 1998. A Strategic Plan for Managing Nonnative Invasive Species and an Implementation Plan are included in the Ecosystem Restoration Program Strategic Plan in Appendices D and E. The Strategic and Implementation Plans describe the mission and goals of the NIS Program control measures and research priorities. If it is found that control efforts are ineffective, and that restored shallow-water habitats do not provide net benefit to native species, shallow-water habitat restoration will be discontinued. Nevertheless, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 2. Blocked access to habitat and altered water quality and flow conditions from placement of barriers in the south Delta.

Barriers in the south Delta would partially block Old River, Grant Line Canal, and part of the Middle River. The barriers would diminish tidal flow, reduce connectivity to other Delta channels, and alter basic hydraulic features that affect sediment and nutrient movement, water quality conditions (for example, increased water temperature and decreased dissolved oxygen), and productivity. Water quality impacts are addressed in Section 5.3. Adverse species-specific impacts include entrainment, interruption of migration toward downstream habitats, and increased loss of planktonic organisms that are prey for many Delta species. Potentially affected species are juvenile chinook salmon, larval and juvenile delta smelt and striped bass, and juvenile splittail. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Create additional habitat for desired species, including increased aquatic area and structural diversity through construction of setback levees and channel islands.
2. Operate new and existing diversions to avoid and minimize effects on fish--avoid facility operations during periods of high species vulnerability.

Increased aquatic habitat area and structural diversity will promote the survivability of different life stages of aquatic species by providing more areas for species to hide, rest, and find food; by promoting greater diversity in aquatic organisms that Delta species feed on; and by reestablishing heating and cooling processes that approximate natural conditions. New and existing diversions can be timed to minimize their effects on aquatic species and can be designed to minimize entrainment through screening. The conclusion that this impact can be mitigated to less than significant is further supported by the Program's commitment to utilize an adaptive management approach for all stages of barrier design, construction, and operation in order to avoid or mitigate significant adverse impacts on fisheries and aquatic organisms. Real-time monitoring, focused studies and pilot projects will inform facility design and development of operational criteria. Implementation will occur in phases to permit new information gained from studies and monitoring to influence changes in facility design and operations. In addition, the MSCS framework will ensure that the Program avoids, minimizes, or compensates for impacts on special status species and habitats prior to or concurrent with implementation.

Impact 3. Altered natural ecosystem structure, removal of benthic communities, and creation of conditions that may damage habitat for desired species from dredging activities and other Program actions.

Levee reconstruction, dredging, and the installation of rock revetment could result in both short- and long-term adverse effects due to habitat encroachment and losses. Levee maintenance could remove tidal marsh communities and riparian vegetation. Dredging to enlarge channels increases channel depth and further alters the natural structural features of the channel. Dredging also removes benthic communities and mobilizes fine sediments. Dredging would adversely affect channel structure, productivity, water quality, and species habitat. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1 Implement BMPs, including a storm water pollution prevention plan, toxic materials control and spill response plan, and vegetation protection plan.
2. Limit construction activities to windows of minimal species vulnerability.
3. Create additional habitat for desired species, including increased aquatic area and structural diversity through construction of setback levees and channel islands.
4. Use cofferdams to construct levees and channel modifications in isolation from existing waterways.
5. Use sediment curtains to contain turbidity plumes during dredging.

These measures are designed to avoid or minimize any temporary turbidity caused by Program implementation, to ensure such turbidity is not toxic, and to minimize the contact between aquatic species and turbid waters. Creating new habitat and a more diverse habitat structure promotes long-term species survivability and offsets short-term and long-term habitat losses. In addition, the MSCS framework will ensure that the Program avoids, minimizes, or compensates for impacts on special status species and habitats prior to or concurrent with implementation.

Impact 4. Release of toxic substances into surface waters.

Waterside construction activities for the Levee System Integrity Program and Ecosystem Restoration Program could result in short-term effects on water quality if toxic substances contained in old levees or in channel sediments are released during waterside levee work or dredging. Dredging may expose mercury-laden sediments and may mobilize other toxic elements. Earth moving and dredging associated with construction of Delta facilities could result in releases of toxic substances. Disturbances to previously farmed soils could release residual agricultural pesticides, including organochlorinated pesticides, mercury, nutrients, and other chemicals that may adversely affect water

quality. Storing water in surface reservoirs may mobilize trace elements, particularly in the deeper parts of the reservoirs where dissolved oxygen concentrations may become depressed. Certain contaminants in sediments, such as mercury, could become available in the water column as a result of implementing the ERP. Under anaerobic conditions, such as after creating a wetland, mercury is methylated and thus mobilized in the water column. Methyl mercury in the water column would be available to fish and other members of the food chain. Fish and other aquatic organisms may bioaccumulate metals and pesticides in their tissues, resulting in reproductive dysfunction, morbidity, or death. Water quality impacts are addressed in Section 5.3. Public health impacts are addressed in Section 7.9. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Implement BMPs, including a storm water pollution prevention plan, toxic materials control and spill response plan, and vegetation protection plan.
2. Limit construction activities to windows of minimal species vulnerability.
3. Use cofferdams to construct levees and channel modifications in isolation from existing waterways.
4. Use sediment curtains to contain turbidity plumes during dredging.
5. Schedule ground disturbing construction during the dry season.
6. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.
7. Identify and investigate issues regarding beneficial reuse of dredged material, including conducting core sampling and analysis of proposed dredged areas, and implement engineering solutions to avoid or prevent environmental exposure to toxic substances after dredging.
8. Cap exposed toxic sediments with clean clay/silt and protective gravel.
9. Locate constructed shallow-water habitat away from sources of mercury until methods for reducing mercury in water and sediment are implemented.

These measures are designed to minimize disturbance of toxic substances in the water and exposure of aquatic species to toxic substances during construction of certain Program actions. CALFED-supported research on mercury in the Delta is already underway to improve scientific understanding of the relationships between mercury and the Bay-Delta ecosystem. The Program provided grant funding in 1997 for research into the effects of wetlands restoration on methyl mercury level that has yielded valuable information. In addition, the Program committed $ 3.8 million for broad-based assessment of ecological and human health impacts of mercury in the Bay-Delta watershed. In addition, the CALFED Agencies have supported a wide range of research into environmental water quality that will yield information that may be useful in designing and mitigating Program actions.

Impact 5. Short-term disturbance of existing biological communities and species habitat, mobilized sediments, and input contaminants from construction activities.

Construction activities associated with habitat restoration, levee reconstruction, construction of the Watershed Program elements, and storage and conveyance facilities, could result in adverse impacts on all species, through disturbance of existing biological communities, mobilization of sediments, and input of contaminants. Conveyance construction activities include new intake facilities, flow control barriers, storage facilities in the Delta, and levee setbacks associated with enlarging the Mokelumne River channel for the diversion facility on the Sacramento River.

Substantial sediment input could degrade aquatic habitat conditions and bury fish eggs and less mobile organisms that serve as fish food. Elevated levels of turbidity (suspended particulate matter) may result when fine sediment is suspended in the water column. Turbidity may cause indirect harm, injury, or mortality to fish species in the vicinity and downstream of the project area. High turbidity concentration can cause fish mortality, reduce fish feeding efficiency, and decrease food availability. Water quality impacts are addressed further in Section 5.3. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Implement Best Management Practices, including a storm water pollution prevention plan, toxic materials control and spill response plan, and vegetation protection plan.
2. Limit construction activities to windows of minimal species vulnerability.
3. Use cofferdams to construct levees and channel modifications in isolation from existing waterways.
4. Use sediment curtains to contain turbidity plumes during dredging.
5. Schedule ground disturbing construction during the dry season.
6. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.
7. Identify and investigate issues regarding beneficial reuse of dredged material, including conducting core sampling and analysis of proposed dredged areas, and implement engineering solutions to avoid or prevent environmental exposure to toxic substances after dredging.

These measures are designed to minimize temporary mobilization of sediments and contaminants caused by Program implementation, and to minimize contact between aquatic species and sediment- or contaminant-laden waters. As previously described, creating new habitat and a more diverse habitat structure promotes long-term species survivability and offsets short-term and long-term habitat losses. In addition, the MSCS framework will ensure that the Program avoids, minimizes, or compensates for impacts on special status species and habitats prior to or concurrent with implementation.

Impact 6. Reduced streamflow and Delta outflow, changed seasonal flow and water temperature variability from water supply management, and changes in salinity associated with several Program elements resulting in reduced habitat abundance, impaired species movement, and increased loss of fish to diversions.

Diversions to new or modified storage could reduce annual outflow and could affect species. Additional export could affect estuarine salinity, adversely affecting the distribution and abundance of some aquatic organisms. Changes in Delta outflow and channel flow could affect the distribution of fish species, increasing entrainment in CVP and SWP exports and other Delta diversions. Water transfers may affect seasonal flow variability and productivity, reducing habitat abundance, reducing transport and attraction flows, and increasing entrainment. Increased water use efficiency could alter the timing of reservoir releases inconsistent with species needs and could affect wetlands and riparian habitats dependent on agricultural inefficiencies. Improved water use efficiency also may reduce the contribution of wastewater to streams, affecting aquatic communities dependent on wastewater-augmented flows. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Operate new and existing diversions to avoid and minimize effects on fish--avoid facility operations during periods of high species vulnerability.
2. Coordinate and maximize water supply system operations flexibility consistent with seasonal flow and water temperature needs of desired species.
3. Utilize the criteria in the Water Transfer Program, in conjunction with existing legal constraints on water transfers, to protect against adverse effects on aquatic species due to water transfers. The criteria for future water transfer proposals include:
    - Transfers must not harm fish and wildlife resources and their habitats.

New and existing diversions can be timed to minimize their effects on aquatic species and can be designed to minimize entrainment through screening. Flexible operations for water supply system operations can also minimize potential flow and temperature impacts on aquatic species by timing releases to coincide with species needs and to approximate natural flow, temperature, and sediment and nutrient conditions. The criteria and objectives in the Water Transfer Program are expected to minimize adverse impacts associated with upstream water transfers. The conclusion that this impact can be mitigated to less than significant is further supported by the CALFED Program's commitment to utilize an adaptive management approach for all stages of storage and conveyance design, construction, and operation in order to avoid or mitigate significant adverse impacts on fisheries and aquatic organisms.

Impact 7. Increased entrainment loss of chinook salmon and other species from diversions to new off-stream and in-Delta storage.

Diversions to off-stream storage, depending on the timing relative to species occurrence, could increase entrainment loss and adversely affect species populations, including chinook salmon and steelhead. Significant adverse impacts may include increased predation associated with the fish screen facility, increased losses attributable to fish screen inefficiency, and increased losses of eggs and larvae of striped bass, splittail, American shad, and other species. Although the diversion into in-Delta storage would be screened, entrainment-related losses would occur, including predation, abrasion and impingement, and entrainment of fish at critical life stages and other aquatic organisms that cannot effectively be screened given the existing technology. Export of in-Delta storage discharged to Delta channels could result in adverse effects. Higher exports resulting from increased storage in the Delta could adversely affect the population abundance of Delta species through entrainment losses of winter-, spring-, and fall-run chinook salmon and adult delta smelt. In addition, increased exports would increase the magnitude of net reverse flow conditions in Old and Middle Rivers and possibly in the lower San Joaquin River. Net reverse flow conditions are counter to natural net flow conditions in Delta channels and could reduce productivity, impair species movement, and increase entrainment in Delta diversions. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Operate new and existing diversions to avoid and minimize effects on fish-avoid facility operations during periods of high species vulnerability.
2. Locate the diversion points to avoid primary distribution of desired species.
3. Control predators in the diversion facility (screen bays) and modify diversion facility structure and operations to minimize predator habitat.
4. Coordinate and maximize water supply system operations flexibility consistent with seasonal flow and water temperature needs of desired species.

Again, new and existing diversions can be timed to minimize their effects on aquatic species and can be designed to minimize entrainment through screening. Diversions can be located and designed to avoid or minimize predation. Flexible operations for water supply system operations can also minimize potential flow and temperature impacts on aquatic species by timing releases to coincide with species needs and to approximate natural flow, temperature, and sediment and nutrient conditions. The conclusion that this impact can be mitigated to less than significant is further supported by the CALFED Program's commitment to utilize an adaptive management approach for all stages of reservoir facility design, construction, and operation in order to avoid or mitigate significant adverse impacts on fisheries and aquatic organisms.

Impact 8. Reduced frequency and magnitude of net natural flow conditions in the south and central Delta from Delta Cross Channel operations and south Delta barriers resulting in reduced system productivity, impaired species movement, and increased losses to diversions.

If the diversion facility on the Sacramento River is not constructed, additional closure of the Delta Cross Channel (DCC) may increase the frequency and magnitude of net reverse flow conditions in the lower San Joaquin River. If net reverse flows are worsened, the reduced frequency of natural net flow conditions in Delta channels could reduce productivity, impair species movement, and increase entrainment in Delta diversions. Species adversely affected could include delta smelt, striped bass, and American shad.

Closure of the south Delta barriers, without a concomitant reduction in exports, would increase net flow toward the CVP and SWP south Delta export intakes, primarily through Turner Cut, Middle River, and Old River. Enlarging Old River north of Clifton Court Forebay will increase SWP pumping capacity, which in turn may increase the magnitude of net reverse flow conditions in Old and Middle Rivers, and possibly the lower San Joaquin River. This counters natural net flow conditions and could reduce productivity, impair species movement, and increase entrainment in the Delta diversions. Species adversely affected could include chinook salmon, steelhead, delta smelt, striped bass, and American shad. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Operate new and existing diversions to avoid and minimize effects on fish–avoid facility operations during periods of high species vulnerability.
2. Coordinate and maximize water supply system flexibility consistent with seasonal flow and water temperature needs of desired species.

New and existing diversions can be timed to minimize the degree of change in flow conditions and can be designed to minimize entrainment through screening. Flexible operations for water supply system operations can also minimize potential flow and temperature impacts on aquatic species by timing releases to coincide with species needs and to approximate natural flow, temperature, and sediment and nutrient conditions.

The conclusion that this impact can be mitigated to less than significant is further supported by the CALFED Program's commitment to utilize an adaptive management approach for all stages of DCC and south Delta barrier operation in order to avoid or mitigate significant adverse impacts on fisheries and aquatic organisms.

Impact 9. Reduced net flow conditions in the Sacramento River downstream of the diversion facility on the Sacramento River.

The diversion of additional Sacramento River water would reduce the magnitude of natural net channel flow in the Sacramento River below the diversion, primarily during February to June. Existing relationships indicate that the diversion would reduce flow in the Sacramento River and would cause an increase in the proportion of flow entering Georgiana Slough. The proportion of juveniles moving from the Sacramento River into the Georgiana Slough, therefore, is expected to increase with the increased flow diverted to the Mokelumne River channel. Survival of chinook salmon that move into the DCC and Georgiana Slough is less than the survival of fishes that continue down the Sacramento River toward Rio Vista. The actual magnitude of survival is uncertain and depends on water temperature, flow, and salinity. The diversion increases the potential to shift X2 (an indicator of the entrapment zone) upstream by reducing net Sacramento River flow. This could reduce habitat quality and quantity for organisms associated with X2. The effects of reduced flow in the Sacramento River below the diversion could adversely affect habitat conditions and reduce the survival of chinook salmon, striped bass, and other species. The minimum flow criteria at Rio Vista and the diversion facility operations criteria would reduce adverse effects. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Operate new and existing diversions to avoid and minimize effects on fish; avoid facility operations during periods of high species vulnerability.
2. Construct a barrier to fish movement on Georgiana Slough.
3. Coordinate and maximize water supply system operations flexibility consistent with seasonal flow and water temperature needs of desired species.

New and existing diversions can be timed to minimize the degree of change in flow conditions and can be designed to minimize entrainment through screening. Flexible operations for water supply system operations can also minimize potential flow and temperature impacts on aquatic species by timing releases to coincide with species needs and to approximate natural flow, temperature, and sediment and nutrient conditions. A barrier to fish movement on Georgiana Slough could increase species survival by keeping more fish in the Sacramento River during outmigration, where species survival is expected to be somewhat higher than in Georgiana Slough.

The conclusion that this impact can be mitigated to less than significant is further supported by the Program's commitment to utilize an adaptive management approach for all stages of diversion facility design, construction, and operation. Construction and operation of the diversion facility on the Sacramento River is contingent upon the avoidance or mitigation of significant, adverse impacts on fish

populations. For example, focused studies to better understand the effects on the survival of fishes downstream of the diversion will precede implementation.

Impact 10. Increased fish mortality through abrasion, increased predation, and other factors from the new fish screen facility for the diversion facility on the Sacramento River.

Operation of the diversion facility would increase juvenile salmon movement from the Sacramento River into the Mokelumne River channels, reducing their survival. In addition, abrasion, increased predation, impingement on fish screens, stress from being handled, and movement to inappropriate habitat would reduce the survival fish contacting the fish screens. The diversion could adversely affect winter-, spring-, late-fall-, and fall-run chinook salmon and possibly other species (for example, steelhead, splittail, striped bass, and American shad). This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Operate new and existing diversions to avoid and minimize effects on fish; avoid facility operations during periods of high species vulnerability.
2. Control predators in the diversion facility (screen bays) and modify diversion facility structure and operations to minimize predator habitat.
3. Construct a barrier to fish movement on Georgiana Slough.
4. Coordinate and maximize water supply system flexibility consistent with seasonal flow and water temperature needs of desired species.

New and existing diversions can be timed to minimize the degree of change in flow conditions and can be designed to minimize entrainment through screening. Flexible operations for water supply system operations can also minimize potential flow and temperature impacts on aquatic species by timing releases to coincide with species needs and to approximate natural flow, temperature, and sediment and nutrient conditions. A barrier to fish movement on Georgiana Slough could increase species survival by keeping more fish in the Sacramento River during outmigration, where species survival is expected to be somewhat higher than in Georgiana Slough.

The conclusion that this impact can be mitigated to less than significant is further supported by the Program's commitment to utilize an adaptive management approach for all stages of diversion facility design, construction, and operation. Construction and operation of the diversion facility on the Sacramento River is contingent upon the avoidance or mitigation of significant, adverse impacts on fish populations. For example, focused studies to better understand the effects of fish screens will precede implementation.

Impact 11. Delayed migration and reduced spawning success for adult fish moving from the Mokelumne River channels into the Sacramento River from fish screens and a diversion facility on the Sacramento River.

Some level of migration delay and blockage is likely if new channels are constructed and the Mokelumne River channel is enlarged as part of the diversion facility on the Sacramento River. This could affect populations of fishes, including chinook salmon, steelhead, splittail, delta smelt, striped bass, sturgeon, and American shad. Impacts may include mortality, reduced fecundity or reproductive success, and straying and could affect the fitness of natural spawning and rearing populations. The addition of Sacramento River flow to the Mokelumne River channels could confuse adult chinook salmon returning to the Mokelumne River to spawn and could delay outmigration of juveniles to the ocean. Although available information has not indicated responses of adult and juvenile chinook salmon to flow changes in the Mokelumne River channels, reduced survival of adults and juveniles could adversely affect the Mokelumne River chinook salmon populations. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategy:

1. Operate new and existing diversions to avoid and minimize effects on fish–avoid facility operations during periods of high species vulnerability.

New and existing diversions can be timed to minimize the degree of change in flow conditions and can be designed to minimize entrainment through screening.

The conclusion that this impact can be mitigated to less than significant is further supported by the Program's commitment to utilize an adaptive management approach for all stages of diversion facility design, construction, and operation. Construction and operation of the diversion facility on the Sacramento River is contingent upon the avoidance or mitigation of significant, adverse impacts on fish populations. For example, focused studies to better understand the effects of Program actions on the migration of adult and juvenile chinook salmon will precede implementation. These studies are identified as critical components of Stage 1 research.

Section 6.2 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts On Vegetation and Wildlife Associated with the Preferred Program Alternative

Impact 1. Temporary and permanent loss and degradation of wetland, riparian and other natural communities.

Some permanent loss and degradation of various habitats, such as wetlands, riparian, annual grasslands, chaparral, woodland, and forest communities may result from inundation, land conversion, and other actions associated with the ERP, Levee Program, Water Use Efficiency Program, Water Transfer Program, and Conveyance and Storage elements.

Permanent impacts primarily would result from conversion of existing habitats to different habitat types and changes in land management practices (for example, changes in cropping patterns on agricultural lands or vegetation management practices). While most habitat restoration acreage would be created by restoring existing agricultural lands to natural habitats, a relatively small amount of some natural plant communities would be converted to open-water or other natural plant communities.

Dredging, levee rehabilitation and constructing setback levees could result in the disturbance and loss of wetland, riparian, grassland, and ruderal habitats. Water Use Efficiency Program measures could result in temporary losses or degradation of wetland and riparian communities (for example, from land grading and construction activities adjacent to habitat areas).

An in-Delta storage facility could remove or disturb existing emergent wetland, riparian, grassland, and ruderal habitat on affected islands. Surface storage reservoirs and associated facilities (for example, conveyance facilities to and from off-stream storage facilities) could inundate wetland, riparian, annual grassland, chaparral, woodland, and forest communities in the San Joaquin River and the Sacramento River Regions. Conveyance actions including construction of the south Delta flow and stage control facilities, the intertie, and the diversion facility on the Sacramento River could result in the temporary or permanent loss of wetland, riparian, grassland, and agricultural habitat types.

Degradation may occur indirectly from various program actions, such as increased recreation on land adjacent to new surface reservoirs and construction noise and human activity. Degradation may also occur indirectly from water quality impacts. Water quality impacts are addressed in Section 5.3. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Avoid direct or indirect disturbance to wetland and riparian communities, special-status species habitat, rare natural communities, significant natural areas, and other sensitive habitat.

2. Design Program features to permit on-site mitigation or nearby restoration of wetland, riparian habitat, special-status species habitat, rare natural communities, and significant natural areas that have been removed by permanent facilities.
3. Restore and enhance sufficient in-kind wetland and riparian habitat or rare natural communities and significant natural areas at offsite locations (near project sites) before or at the time that project impacts are incurred. Replace not only acreage lost, but also habitat value loss.
4. Restore wetland and riparian communities, special-status species habitat, and wildlife use areas temporarily disturbed by on-site construction activities immediately following construction. Example actions include direct planting of native plants, controlling non-native plants to improve conditions for reestablishing native plants, and enhancing and restoring the original site hydrology to allow for the natural reestablishment of the affected plant community.
5. Phase the implementation of Ecosystem Restoration Program habitat restoration to offset temporary habitat losses and to restore habitat (including special-status species habitat) before, or at the same time that, project impacts associated with the Ecosystem Restoration Program are incurred.
6. Maintain sufficient outflow downstream of constructed off-stream reservoirs to maintain existing downstream wetland riparian communities.
7. Manage recreation-related activities on lands managed under the Program to reduce or avoid impacts on sensitive habitat, important wildlife use areas, and special-status species.
8. Avoid creating wetlands in areas with high concentrations of mercury in sediments.

This conclusion is further supported by the adaptive management approach to ecosystem restoration contained in the ERP. Many ERP Stage 1 actions are designed to develop a better understanding of factors that influence the success of habitat creation and restoration efforts and the ensuing benefits to species. These Stage 1 actions, as outlined in the ERP Strategic Plan, Attachment D, are therefore expected to improve the likelihood that the foregoing mitigation strategies will be successful when implemented.

Impact 2. Substantial temporary or permanent loss and disturbance of wintering waterfowl foraging habitat.

Restoration of floodplain habitats could result in the loss of agricultural lands adjacent to streams and rivers and could reduce foraging habitat area for wintering waterfowl. The loss of agricultural lands that provide high wildlife forage values could result in a reduction in available forage for such species as Swainson's hawks, greater sandhill cranes, and wintering waterfowl, if natural and agricultural habitats restored or enhanced under the program provide less forage than is provided by the affected agricultural lands. Changes in agricultural practices from the Water Quality Program could result in a loss of habitat for some wildlife that use agricultural lands (for example, wintering waterfowl) if such changes reduce the amount or availability of forage on affected lands. Under the Water Use Efficiency Program, changes in cropping patterns, depending on the location and types of cropland that

would be affected, could result in a reduction in the quantity or quality of forage for wintering waterfowl, Swainson's hawks, and greater sandhill cranes. Under the Levee System Integrity Program, temporary and permanent losses of levee and adjacent habitats would reduce available habitat for associated plant and wildlife species, including wintering waterfowl. Land that provides habitat for wintering waterfowl may be permanently lost by Storage and Conveyance actions. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Restore or enhance sufficient waterfowl foraging habitat near existing use areas to offset impacts on the abundance, quality, and availability of waterfowl forage. Restoration and enhancement actions include restoring and managing seasonal wetlands for wintering waterfowl, producing crops with high forage value (such as corn and rice), and modifying farming practices to increase forage availability (for example, leaving portions of forage crops unharvested through winter or shallowly flooding fields).
2. Phase the ERP to initially restore natural waterfowl foraging habitat on agricultural lands with low forage value while restored habitat with high forage value develops.
3. Phase the ERP to initially restore wetland habitat with high forage value to offset the loss of agricultural foraging habitat that may result from the ERP.

Impact 3. Substantial decrease in important upland wildlife habitat and use areas.

New off-stream or modified existing surface storage reservoirs and associated facilities (for example, conveyance facilities to and from off-stream storage facilities) could inundate or degrade important upland wildlife habitat and use areas, depending on where facilities are located and specific project design. Storage facility-related construction activities could cause short-term degradation and loss of important upland wildlife habitat and use areas. Degradation of important upland wildlife habitat and use areas may occur indirectly from various program actions, such as increased recreation on land adjacent to new or expanded surface reservoirs and construction noise and human activity associated with various CALFED Program actions. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Avoid important wildlife habitat areas, such as critical deer winter range and fawning habitat.

2. Restore and enhance important wildlife habitat use areas temporarily disturbed by on-site construction activities by planting and maintaining native species immediately following construction.
3. Restore and enhance upland habitat areas within affected watersheds or in other watersheds if sufficient habitat enhancement is unavailable within the affected watershed. This could include modifying existing land management practices (for example, grazing and fire management practices) to improve conditions for the natural reestablishment and long-term maintenance of affected plant communities and habitats.
4. Avoid construction or maintenance activities within or near occupied special-status species habitat areas or important wildlife use areas when species may be sensitive to disturbance, such as during the breeding season.
5. Restore and enhance suitable habitat areas that are occupied by, or are near and accessible to, special-status species that have been adversely affected by the permanent removal of occupied habitat areas.
6. Manage recreation-related activities on lands managed under the Program to minimize or avoid potential adverse effects of recreation-related activities on sensitive habitats, important wildlife use areas, and special-status species.

Impact 4. Temporary and permanent fragmentation of riparian habitats and/or wildlife movement corridors.

Various types of levee upgrade designs could result in temporary or permanent fragmentation of existing riparian corridors that provide cover for some species during migration or local movements. Implementing the ERP could cause fragmentation of wetland, riparian, and agricultural wildlife foraging habitats.

New or modified existing surface storage reservoirs and associated facilities (for example, conveyance facilities to and from off-stream storage facilities) could fragment riparian corridors and disrupt historical movement patterns of some wildlife, depending on where facilities are located and specific project design. This impact is considered significant.

Implementation of the following mitigation strategies will reduce the impact caused by the levee improvements and the Ecosystem Restoration Program to less than significant. Implementation of the following mitigation strategies will reduce the impact caused by the Storage element.

Mitigation Strategies:
1. Avoid direct or indirect disturbance to wetland and riparian habitats and other sensitive habitat.
2. Restore riparian vegetation disturbed by on-site construction activities immediately following construction.

3. Restore or enhance sufficient in-kind riparian habitat at off-site locations, near project sites, in a manner that reduces the degree of existing habitat fragmentation before, or when, project impacts are incurred to offset habitat losses.
4. Restore habitat temporarily disturbed by on-site construction activities immediately following construction.
5. Phase the implementation of the Ecosystem Restoration Program habitat restoration to offset temporary habitat losses and to restore habitat before, or at the same time that, project impacts associated with the ERP are incurred.
6. Phase the implementation of modifications to levees that would be necessary to meet PL 84-99 standards in order to minimize the effects of fragmentation of riparian habitats and associated wildlife.
7. Avoid important wildlife habitat areas, such as critical deer winter range and fawning habitat.
8. Restore and enhance upland habitat areas within affected watersheds, or in other watersheds if sufficient habitat enhancement is unavailable within the affected watershed.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear whether the impact from construction of new or modified storage can be mitigated to less than significant. Depending on where storage facilities are located and specific project design, avoiding or mitigating permanent fragmentation of riparian habitats and/or wildlife movement corridors may not be feasible. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 5. Temporary or permanent loss of habitat or direct impacts on special-status species.

Implementation of the ERP could cause temporary impacts on special-status species and their habitats. Permanent impacts of implementing the ERP on special-status species and their habitats primarily would result from conversion of existing habitats to different habitat types and changes in land management practices (for example, changes in cropping patterns on agricultural lands or vegetation management practices). While most habitat restoration acreage would be created by restoring existing agricultural lands to natural habitats, a relatively small amount of some natural plant communities would be converted to open-water or other natural plant communities. Construction and habitat management related activities of the ERP and Watershed Program could result in temporary disturbance to, or mortality of, special-status species that may be present on or near areas where ERP and Watershed Program measures are implemented. Methylation of mercury in restored shallow-water habitats could impact fish and other members of the food chain, including special-status species.

Permanent impacts from the Watershed Program could include the loss of occupied special-status species habitat as a result of converting existing habitat to a different habitat type.

Construction and levee management related activities could result in temporary disturbance to or mortality of special-status species that may be present or near where CALFED Program actions are

implemented. Removal of grassland, wetland and agricultural land adjacent to existing levees to increase the land base of levees reduces the availability in these habitat areas for associated plant and wildlife species, including special-status species.

Changes in agricultural practices from the Water Quality Program could result in a loss of habitat for some wildlife, including special-status species, that use agricultural lands (for example, wintering waterfowl) if such changes reduce the amount or availability of forage on affected lands. Water Quality Program measures that result in ground disturbance, such as relocating water intakes, could cause localized and temporary disturbances to habitats and associated vegetation and wildlife, including special-status species, in some locations.

Construction-related Water Use Efficiency activities could result in disturbance to special-status species present or near where program actions are implemented. Some measures included in the Water Use Efficiency Program could result in temporary and permanent losses of incidental wetland and riparian communities, adversely affecting wildlife, including special-status species.

Water transfers could locally reduce the availability of habitat for special-status species.

Construction of storage facilities could impact special-status plants and animals as a result of construction-related activities and inundation of existing habitats, depending on where facilities are located and specific project design.

South Delta modification construction-related activities and operation of barriers could result in disturbance to or mortality of special-status species and loss or degradation of their habitats. In addition, construction of the intertie and a diversion facility on the Sacramento River could result in disturbance to or mortality of special-status species and loss or degradation of their habitats. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Avoid direct or indirect disturbance to areas occupied by special-status species.
2. Design program features to permit on-site mitigation or nearby restoration of wetland, riparian habitat and special-status species habitat that have been removed by permanent facilities.
3. Restore and enhance in-kind wetland and riparian habitat or rare natural communities and significant natural areas at offsite locations before or at the time that project impacts are incurred.
4. Restore wetland and riparian communities and special-status species habitat temporarily disturbed by on-site construction activities immediately following construction. Example actions include direct planting of native plants, controlling non-native plants to improve conditions for reestablishing native plants, and enhancing and restoring the original site hydrology to allow for the natural reestablishment of the affected plant community.
5. Phase the implementation of Ecosystem Restoration Program habitat restoration to offset temporary habitat losses and to restore habitat (including special-status species habitat) before, or at the same time that, project impacts associated with the ERP are incurred.

6. Restore and enhance suitable habitat areas that are occupied by, or are near and accessible to, special-status species that have been affected by the permanent removal of occupied habitat areas.
7. Phase habitat restoration actions to restore sufficient suitable habitat to minimize the adverse affects of impacts on occupied special-status species habitats before impacts are incurred.
8. Avoid construction or maintenance activities within or near habitat areas occupied by special-status wildlife species during the breeding season or other periods when species may be sensitive to disturbance.
9. Establish additional populations of special-status species in protected suitable habitat elsewhere within their historical range for species for which relocation or artificial propagation is feasible.
10. Provide incentives to alter agricultural practices to improve habitat conditions for affected special-status species that use agricultural lands. This could include planting and managing crops to increase the availability or quantity of forage for affected species.
11. Manage recreation-related activities on lands managed under the Program to reduce or avoid impacts on sensitive habitats and special-status species.
12. Avoid creating wetlands in areas with mercury in sediments and anaerobic conditions.

The conclusion that this impact can be mitigated to less than significant is further supported by implementation of the Multi-Species Conservation Strategy (MSCS). The MSCS framework will ensure that the Program avoids, minimizes, or compensates for impacts on special status species prior to or concurrent with implementation. More detailed measures to avoid direct impacts on special - status species are included in MSCS Attachments D and E and refine the programmatic avoidance mitigation strategy listed above, including:

- Avoid or minimize direct disturbance to populations and individuals of evaluated plant species.
- To the extent practicable, remove or exclude evaluated amphibian and reptile species from construction corridors before construction is initiated.
- To the extent practicable, trap and relocate evaluated wildlife species that would be unlikely to escape from the inundation area of new storage reservoirs to suitable nearby habitat areas.
- Conduct surveys to determine the presence and distribution of [species] in suitable habitat before implementing CALFED actions that could result in the loss or degradation of habitat.

Impact 6. Loss of portions of rare natural communities and significant natural areas.

Permanent impacts of implementing the ERP on rare natural communities and significant natural areas could result from conversion of existing habitats to different habitat types and changes in land management practices (for example, changes in cropping patterns on agricultural lands or vegetation management practices). While most habitat restoration acreage would be created by restoring existing

agricultural lands to natural habitats, a relatively small amount of some natural plant communities would be converted to open-water or other natural plant communities. In addition, Watershed Program activities could result in temporary or permanent losses of natural habitats, including rare natural communities and significant areas.

Finally, the loss of portions of rare natural communities and significant natural areas may result from the construction of Storage and Conveyance facilities, depending on where facilities are located and specific project design. This impact is considered significant.

Implementation of the following mitigation strategies will reduce the impact caused by the Watershed Program and the Ecosystem Restoration Program to less than significant. Implementation of the following mitigation strategies will reduce the impact caused by the Storage element.

Mitigation Strategies.

1. Avoid direct or indirect disturbance to rare natural communities, significant natural areas, and other sensitive habitat.
2. Design program features to permit on-site mitigation or nearby restoration of wetland, riparian habitat, special-status species habitat, rare natural communities, and significant natural areas that have been removed by permanent facilities.
3. Restore and enhance in-kind wetland and riparian habitat or rare natural communities and significant natural areas at offsite locations before or at the time that project impacts are incurred.
4. Restore rare natural communities, significant natural areas, and wildlife use areas temporarily disturbed by on-site construction activities immediately following construction. Example actions include direct planting of native plants, controlling non-native plants to improve conditions for reestablishing native plants, and enhancing and restoring the original site hydrology to allow for the natural reestablishment of the affected plant community.
5. For species for which relocation or artificial propagation is feasible, establish additional populations of special-status species adversely affected by the Program in suitable habitat areas elsewhere within their historical range.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear whether the Storage impact can be mitigated to less than significant. Depending on where storage facilities are located and specific project design, avoiding impacts on rare natural communities and significant natural areas may not be feasible. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 7. Temporary disturbance or mortality of special-status species due to construction and habitat management activities.

Implementation of the ERP could cause temporary impacts on special-status species and their habitats. Construction and habitat management related activities of the ERP and Watershed Program could result in temporary disturbance to, or mortality of, special-status species that may be present on or near areas where ERP and Watershed Program measures are implemented. Temporary impacts could include displacement of resident species, local erosion and siltation of nearby streams and waterways, and disturbance of resident species as a result of construction activities. Certain contaminants in sediments, such as mercury, could become available in the water column as a result of implementation. Methylation of mercury in restored shallow-water habitats could impact fish and other members of the food chain, including special-status species.

Construction and levee management-related activities could result in temporary disturbance to or mortality of special-status species. Removal of grassland, wetland and agricultural land adjacent to existing levees to increase the land base of levees could affect special-status species.

Water Quality Program measures that result in ground disturbance, such as relocating water intakes, could cause localized and temporary disturbances to habitats and associated vegetation and wildlife, including special-status species, in some locations.

Construction-related Water Use Efficiency activities could result in disturbance to special-status species present or near where program actions are implemented. Some measures included in the Water Use Efficiency Program could result in temporary and permanent losses of incidental wetland and riparian communities, adversely affecting wildlife, including special-status species.

Construction of storage facilities could result in significant impacts on special-status plants and animals as a result of construction-related activities and inundation of existing habitats, depending on where facilities are located.

South Delta modification construction-related activities and operation of barriers could result in disturbance to or mortality of special-status species and loss or degradation of their habitats. In addition, construction of the intertie and a diversion facility on the Sacramento River could result in disturbance to or mortality of special-status species and loss or degradation of their habitats. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Avoid direct or indirect disturbance to wetland and riparian communities, special-status species habitat, rare natural communities, significant natural areas, and other sensitive habitat.

2. Restore wetland and riparian communities, special-status species habitat, and wildlife use areas. temporarily disturbed by on-site construction activities immediately following construction. Example actions include direct planting of native plants, controlling non-native plants to improve conditions for reestablishing native plants, and enhancing and restoring the original site hydrology to allow for the natural reestablishment of the affected plant community.
3. Manage recreation-related activities on lands managed under the Program to reduce or avoid impacts on sensitive habitat, important wildlife use areas, and special-status species.
4. Implement BMPs such as avoiding disturbance to highly erodible soils and installing siltation barriers and detention basins to reduce the potential for siltation of nearby wetlands.

The conclusion that this impact can be mitigated to less than significant is further supported by implementation of the Multi-Species Conservation Strategy (MSCS). The MSCS framework will ensure that the Program avoids, minimizes, or compensates for impacts on special status species prior to or concurrent with implementation. More detailed measures to avoid direct impacts on special - status species are included in MSCS Attachments D and E and refine the programmatic avoidance mitigation strategy listed above, including:

- Avoid or minimize direct disturbance to populations and individuals of evaluated plant species.
- To the extent practicable, remove or exclude evaluated amphibian and reptile species from construction corridors before construction is initiated.
- To the extent practicable, trap and relocate evaluated wildlife species that would be unlikely to escape from the inundation area of new storage reservoirs to suitable nearby habitat areas.
- Conduct surveys to determine the presence and distribution of species in suitable habitat before implementing CALFED actions that could result in the loss or degradation of habitat.

Impact 8. Permanent loss of incidental wetland and riparian habitats that depend on agricultural inefficiencies.

The Water Use Efficiency Program may result in permanent losses of incidental wetland and riparian communities on agricultural land (from reduced or lost flows, including on-farm flows and flows in district-level delivery canals). Increasing irrigation and drainage efficiencies could result in less water available to incidental habitats that depend on existing inefficiencies. Under the Water Use Efficiency Program, agricultural lands that provide relatively high wildlife habitat value could be reduced in some years if cropland is fallowed or could be permanently lost if converted to produce crops that provide lower wildlife values. Impacts to agricultural land are addressed in Section 7.1. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategy:

1. Restore or enhance in-kind wetland and riparian communities and wildlife use areas at off-site locations before, or at the time that, project impacts are incurred.

Impact 9. Reduction in quantity or quality of forage for species of concern.

Permanent impacts of the Ecosystem Restoration Program on vegetation and wildlife resources primarily would result from conversion of existing habitats to different habitat types and changes in land management practices (for example, changes in cropping patterns on agricultural lands or vegetation management practices). The loss of agricultural lands that provide high wildlife forage values could result in a reduction in available forage for such species as Swainson's hawks, greater sandhill cranes, and wintering waterfowl if natural and agricultural habitats restored under the program provide less forage than is provided by the affected agricultural lands. Setback levees along the North Fork of the Mokelumne River from I-5 to the San Joaquin River could result in the loss of agricultural habitat area. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Design program features to permit on-site mitigation of wetland, riparian, or other sensitive habitat.
2. Restore or enhance waterfowl foraging habitat near existing use areas.
3. Phase the Ecosystem Restoration Program to initially restore natural waterfowl foraging habitat on agricultural lands with low forage value while restored habitat with high forage value develops.
4. Phase the Ecosystem Restoration Program to initially restore wetland habitat with high forage value to offset the loss of agricultural foraging habitat that may result from the Ecosystem Restoration Program.
5. Provide incentives to alter agricultural practices to improve habitat conditions for affected species of concern that use agricultural land. This could include planting and managing crops to increase the availability or quantity of forage for affected species.

Section 7.1 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Agricultural Land and Water Use Associated with the Preferred Program Alternative

Impact 1. Conversion of prime, statewide important, and unique farmlands to project uses.

The Ecosystem Restoration Program could convert up to approximately 152,000 acres of prime, statewide important and unique agricultural lands to other uses in the Delta, Sacramento River, and San Joaquin River Regions. The Water Quality Program could result in retirement of up to approximately 37,000 acres of agricultural land in the San Joaquin River Region as a measure to improve water quality in the Grasslands Subarea. The Levee System Integrity Program could convert up to approximately 35,000 acres of Delta Region farmland but provide greater protection to farmland from flooding and salinity intrusion. Agricultural lands, including prime, statewide important and unique farmlands, ranging from up to approximately 15,700 acres without a diversion facility on the Sacramento River to up to 19,500 with a facility, would be converted by storage and conveyance facilities. Water transfers may indirectly result in reduction of agricultural acreage. Finally, conversion may result if dredged spoils are permanently disposed of on agricultural lands. Water use is discussed in Sections 5.1 and 5.2. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:

1. Site and align Program features to avoid or minimize impacts on agriculture.
2. Restore existing degraded habitat as a priority before converting agricultural land.
3. Focus habitat restoration efforts on developing new habitat on public lands before converting agricultural land.
4. If public lands are not available for restoration efforts, focus restoration efforts on acquiring lands that can meet ecosystem restoration goals from willing sellers where at least part of the reason to sell is an economic hardship (for example, lands that flood frequently or where levees are too expensive to maintain).
5. Provide water supply reliability benefits to agricultural water users.
6. Support the California Farmland Conservancy Program in acquiring easements on agricultural land in order to prevent its conversion to urbanized uses and increase farm viability. Focus on lands in proximity to where any conversion impact takes place.
7. Use farmer-initiated and developed restoration and conservation projects as a means of reaching Program goals.
8. Retain water allocations from retired drainage-impaired lands within the existing water districts.
9. Support the testing and application of alternative crops to idled farmland (for example, agroforestry or energy crops).

10. Examine structural and nonstructural alternatives to achieve project goals in order to avoid impacts on agricultural land.
11. Where small parcels of land need to be acquired for waterside habitat, seek out points of land on islands where the ratio of levee miles to acres farmed is high.
12. Obtain easements on existing agricultural land for minor changes in agricultural practices (such as flooding rice fields after harvest) that would increase the value of the agricultural crop(s) to wildlife.
13. Include provisions in floodplain restoration efforts for compatible agricultural practices.
14. Purchase water for habitat purposes so that the same locality is not affected over the long term.
15. Use a planned or phased habitat development approach in concert with adaptive management.
16. Minimize the amount of water supply required to sustain habitat restoration acreage.
17. In implementing levee reconstruction measures, work with landowners to establish levee reconstruction methods that avoid or minimize the use of agricultural land.
18. Work with landowners to establish levee subsidence BMPs that avoid impacts on land use practices. Through adaptive management, further modify BMPs to reduce impacts on agricultural land.
19. Use rotational fallowing to reduce selenium drainage.
20. When it appears that land within an agricultural preserve may be acquired from a willing seller by a State CALFED agency for a public improvement as used in Government Code Section 51920, advise the Director of Conservation and the local governing body responsible for the administration of the preserve of the proposal.
21. Limit the number of acres that can be fallowed (in order to produce transferrable water) in a given area (district or county) or the amount of water that can be transferred from a given area.
22. Support assistance programs to aid local entities in developing and implementing groundwater management programs in water transfer source areas.
23. Dredged materials will be analyzed, dredged and handled in accordance with permit requirements. Permits will incorporate mitigation strategies identified in Section 5.3 to prevent release of contaminants of concern.
24. Utilize the criteria in the Water Transfer Program, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers. The criteria for future water transfer proposals include:
    - Water transfers must be voluntary.
    - Water market transactions must result in the transfer or exchange of water that truly increases the utility of the supply, not water that a transferor has never used or water that would have been legally available for downstream use in the absence of a transfer.
    - Water rights of all legal water users must not be impaired.
    - Transfers must not cause overdraft or degradation of groundwater basins, or impair correlative rights of overlying users.
    - Entities receiving transferred water should be required to show that they are making efficient use of existing water supplies.

- Water rights holders (whether districts or individuals) must play a strong role in determining whether water to which they have a right is transferred.
- The beneficial and adverse impacts on fiscal integrity of the districts and on the economy of agricultural communities in source and receiving areas cannot be ignored.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear that this impact can be mitigated to less than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 2. Conflicts with local government plans and policies.

Conversion of prime, state-wide important, or unique farmland to other uses likely would conflict with many local or regional agricultural land use policies. It is likely that lands designated for agriculture in county and city general plans would be used for storage, conveyance, habitat, and levee purposes. Thus, inconsistency with these plans could result in a significant adverse impact on agricultural land use. It is likely that a substantial amount of the agricultural land that the various programs could convert would be enrolled in the California Land Conservation Act, known as the Williamson Act. While projects from both the ERP and the Levee System Integrity Program likely would be compatible with the Act, Williamson Act contracted lands may also be acquired for other Program purposes, such as storage and conveyance. The loss of Williamson Act-contracted land for any of these program purposes is considered a potentially significant impact. Storage facilities could conflict with local and regional plans regarding agricultural lands in the foothill or mountain areas in the Sacramento River Region. Some agricultural land, which could be classified as locally important or grazing lands, could be affected by the Storage Program elements. Development of storage facilities in the San Joaquin River Region could conflict with local and regional plans regarding agriculture. Water transfers could cause land use changes that are inconsistent with local agricultural objectives. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:
1. Implement features that are consistent with local and regional land use plans.
2. Involve all affected parties, especially landowners and local communities, in developing appropriate configurations to achieve the optimal balance between resource impacts and benefits.
3. Advise the Director of Conservation and the local governing body responsible for the administration of the preserve of the proposal when it appears that land within an agricultural preserve may be

acquired from a willing seller by a State CALFED agency for a public improvement as used in Government Code Section 51920.

4. Utilize the criteria in the Water Transfer Program, listed above under Impact 1, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear that this impact can be mitigated to less than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 3. Conflicts with adjacent land uses.

Restoration of habitat adjacent to agricultural operations could cause compatibility issues. If adjacent habitats contained sensitive species, aerial spraying of farmlands could be constrained. Weeds or pest species could move from restored habitat lands to agricultural fields, while removal or eradication could be constrained. Levee System Integrity Program and Ecosystem Restoration Program measures may create incompatibilities with adjacent land uses due to construction-related and post-construction sedimentation and erosion.

Adjacent land use may be affected by groundwater seepage and soil waterlogging. In-Delta storage could increase hydraulic head at the storage site and cause substantial groundwater underflow toward the tracts on the opposite banks of the island storage. Leakage could occur through the unlined canal transferring water from the diversion facility on the Sacramento River, waterlogging the soils along the alignment of the canal. Seepage could also be caused by the flooding of Delta islands for habitat restoration and from altered levee vegetation management practices. Related seepage impacts to groundwater, soils, and flood control are addressed in Sections 5.4, 5.5, and 7.8.

Water use efficiency measures may indirectly affect agricultural land use by causing a shift to high-value crops. The Water Transfer Program could cause land use changes that are inconsistent with local agricultural objectives.

Groundwater storage projects in the Sacramento River and San Joaquin River Regions could affect adjacent agricultural operations. Particularly in dry years, groundwater level declines could occur as result of overpumping in storage facilities. In extreme cases, the use of wells on adjacent or nearby properties could be lost due to adverse groundwater quality or lower groundwater levels. Economic impacts are discussed in Section 7.2. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:

1. Develop buffers and other tangible support for remaining agricultural lands. Vegetation planted on these buffers should be compatible with farming and habitat objectives.
2. Implement erosion control measures to the extent possible during and after project construction activities. These erosion control measures can include grading the site to avoid acceleration and concentration of overland flows, using silt fences or hay bales to trap sediment, and revegetation areas with native riparian plants and wet meadow grasses.
3. Protect exposed soils with mulches, geotextiles, and vegetative ground covers to the extent possible during and after project construction activities in order to minimize soil loss.
4. Utilize the criteria in the Water Transfer Program, listed above under Impact 1, in conjunction with existing legal constraints on water transfers, to protect against adverse effects due to water transfers.
5. Implement seepage control measures.
6. Support local groundwater management planning that reduces overdraft and third-party impacts.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear that this impact can be mitigated to less than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Section 7.4 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Urban Land Use Associated with the Preferred Program Alternative

Impact 1. Displacement of some existing commercial uses and residents from Program actions located in urban land use areas.

Ecosystem Restoration Program actions could displace some commercial uses and residents. In addition, developing new surface water storage or enlarging existing storage reservoirs could displace some commercial uses and residents. Finally, conveyance components such as channel widening and dredging could require relocation of some commercial uses and a few scattered residences. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Select and design program actions that minimize the displacement of existing residents.
2. Select and design Program actions that do not physically disrupt or divide established communities.
3. Provide relocation assistance to displaced persons or businesses.
4. Minimize the amount of permanent easement required for construction of facilities and consult with property owners to select easement locations that would lessen property disruption and fragmentation.

Impact 2. Physical disruption or division of established communities.

Ecosystem Restoration Program actions could physically disrupt or divide established communities. Developing new surface water storage or enlarging existing storage reservoirs could physically disrupt or divide established communities in the Delta, Bay, Sacramento River and San Joaquin River Regions. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Select and design Program actions that minimize the displacement of existing residents.
2. Select and design Program actions that do not physically disrupt or divide established communities.

3. Select Program actions that are consistent with local and regional land use plans. This could include consulting and working with local jurisdictions affected by Program actions early in the planning and environmental review process.
4. Notify all affected persons (for example, residents, property owners, school officials, and business owners) in the project area of the construction plans and schedules. This could include arranging schedules for road detours with residents and businesses to maintain access to homes, schools, and businesses; as well as providing protection, relocation, or temporary disconnection of utility services.
5. Provide relocation assistance to displaced persons or businesses.
6. Minimize the amount of permanent easement required for construction of facilities and consult with property owners to select easement locations that would lessen property disruption and fragmentation.
7. Relocate roads and utilities prior to project construction to ensure continued access and utility service through the project area.
8. Prepare a detailed engineering and construction plan as part of the project design plans and specifications, and include procedures for rerouting and excavating, supporting, and filling areas around utility cables and pipes in this plan.
9. Verify utility locations through consultation with appropriate entities and field surveys (such as probing and pot-holing).
10. Reconnect disconnected cables and lines promptly.

Impact 3. Potential conflicts of habitat development and storage and conveyance facilities with general plan land use designations or zoning if located in urban use areas.

Ecosystem Restoration Program actions could conflict with city or county general plan designations and zoning. Developing new surface water storage or enlarging existing storage reservoirs could conflict with general plan designations and zoning in the Delta, Bay, Sacramento River and San Joaquin River Regions. Since the commitment to construct storage facilities at specific locations has not been made, consistency with local general plans will be analyzed prior to making a decision to construct on these sites. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Select Program actions that are consistent with local and regional plans.
2. Notify all affected persons (for example, residents, property owners, school officials, and business owners) in the project area of the construction plans and schedules.

Section 7.6 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Utilities and Public Services Associated with the Preferred Program Alternative

Impact 1. Need for relocation or modification of major infrastructure components.

Some infrastructure, including electrical transmission lines, and substations, communication lines, natural gas lines, or water conveyance structures, may need to be relocated or modified as a result of Ecosystem Restoration Program actions. Implementation of the Water Quality Program could require the relocation of water supply intakes and conveyance structure. The Water Use Efficiency Program could require new distribution systems to provide increased levels of recycled water to potential customers. Modification or relocation of existing levees under the Levee System Integrity Program could require the displacement or modification of utility infrastructure, including natural gas and electric transmission lines and communication infrastructure. Construction of storage facilities could require the relocation or modification of natural gas, electric, and communication transmission lines and other major infrastructure. Construction of floodways, setback levees, intake structures, interties, and channel conveyance modifications for the diversion facility could require the relocation of natural gas and electric transmission lines, and communication infrastructure in the Delta Region. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Site project facilities and transmission infrastructure to avoid existing infrastructure.
2. Construct overpasses, small bridges, or other structures to accommodate existing infrastructure.
3. Design and operate facilities to minimize the amount of energy required and to maximize the amount of energy created.
4. Design project facilities to avoid or minimize their effect on existing infrastructure.

Impact 2. Increased risk of gas line rupture during construction.

Construction associated with the Levee System Integrity Program could increase the risk of gas line rupture, in particular to lines that cross exterior levees. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Coordinate construction activities with utility providers.
2. Design project facilities to avoid or minimize their effect on existing infrastructure.

Section 7.7 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Recreation Associated with the Preferred Program Alternative

Impact 1. Temporary closure of recreation areas during construction.

During construction of Ecosystem Restoration Program and Levee System Integrity Program actions, some recreation areas or facilities may be temporarily closed to the public. Certain recreation facilities, such as piers or marinas, would be temporarily or permanently closed following restoration actions. Temporary, seasonal, or permanent closure of Delta waterways could affect boating access and circulation.

Activities associated with the Watershed Program could result in blocked access to or temporary closure of recreation areas.

A diversion facility on the Sacramento River and accompanying conveyance channel and channel modifications may result in temporary recreation impacts during construction. Some of these actions could permanently displace land-based recreation opportunities including camping, hiking, and picnicking.

Dredging could result in short-term construction impacts, such as obstructing or closing channels and creating noise and visual impacts. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Incorporate project-level recreation improvements and enhancements.
2. Maintain boating access to prime areas.
3. Identify and mark alternate boating routes.
4. Provide public information regarding alternate access.
5. Avoid construction during peak-use seasons and times.
6. Post warning signs and buoys in channels.
7. Work with recreational interests to protect and enhance recreation resources.
8. Provide in-kind recreation facilities.
9. Provide or improve vehicle access and parking for recreation areas.
10. Provide access to waterfront areas and island edges.
11. Create new day-use boating and camping areas.
12. Conduct an analysis of boating circulation to ensure that appropriate alternative routes are identified and clearly marked if boating circulation in the Delta is to be modified due to temporary, seasonal, or permanent channel closures or to speed restrictions.
13. Restore and design existing and new levees to accommodate vehicular access and parking for shoreline fishing, boat launching, swimming, hiking, bicycling, and wildlife viewing whenever feasible.

Impact 2. Decrease in recreation opportunities and increases in boat traffic in some areas due to speed zone restrictions or prohibition of motorized boating in some areas.

Prohibition of motorized boating, short-term construction-related access restrictions, and speed restrictions to protect erosion-prone habitat and levees from boat wakes could alter personal watercraft and boat use and decrease the number of use-days for boating in the Delta. Boat traffic could increase in some areas as a result of these speed and access restrictions and from temporary and permanent closure of recreation facilities in other areas. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Incorporate project-level recreation improvements and enhancements.
2. Maintain boating access to prime areas.
3. Identify and mark alternate boating routes.
4. Construct portage facilities.
5. Construct boat locks.
6. Provide public information regarding alternate access.
7. Avoid construction during peak-use seasons and times.
8. Post warning signs and buoys in channels.
9. Work with recreational interests to protect and enhance recreation resources.
10. Create new day-use boating and camping areas.
11. Conduct an analysis of boating circulation to ensure that appropriate alternative routes are identified and clearly marked if boating circulation in the Delta is to be modified due to temporary, seasonal, or permanent channel closures or to speed restrictions.

Impact 3. More stringent enforcement of boat discharges.

As a measure to protect water quality, the Ecosystem Restoration Program will provide additional funding to the agencies responsible for enforcing existing regulations on the discharge of boat septic systems. Since this action only involves enforcement of existing regulations, this impact is anticipated to be less than significant.

To the extent that this action may result in a minor impact, implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Incorporate project-level recreation improvements and enhancements.

2. Work with recreational interests to protect and enhance recreation resources.
3. Relocate or construct new recreation facilities and infrastructure.

Impact 4. Temporary or permanent changes in boating access and navigation.

During construction of Ecosystem Restoration Program and Levee System Integrity Program actions, some recreation areas or facilities may be temporarily closed to the public. Certain recreation facilities, such as piers or marinas, would be temporarily or permanently closed following restoration actions. Temporary, seasonal, or permanent closure of Delta waterways could affect boating access and circulation. Prohibition of motorized boating and speed restrictions to protect newly restored habitats from boat wakes could alter personal watercraft and boat use and decrease the number of use-days for boating in the Delta.

Operating fish and flow control barriers in the south Delta could restrict boat access and navigation.

Changes in reservoir operations related to water transfers, water supply needs, or fish recovery could affect existing minimum pool levels and adversely affect recreational opportunities related to specific water surface elevations, including access to marinas and boat launching facilities. This impact is considered significant.

Implementation of the following mitigation strategies will reduce the temporary impact to less than significant. Implementation of the following mitigation strategies will reduce the permanent impact on boating access and navigation.

Mitigation Strategies:
1. Incorporate project-level recreation improvements and enhancements.
2. Maintain boating access to prime areas.
3. Identify and mark alternate boating routes.
4. Construct portage facilities.
5. Construct boat locks.
6. Provide public information regarding alternate access.
7. Avoid construction during peak-use seasons and times.
8. Post warning signs and buoys in channels.
9. Work with recreational interests to protect and enhance recreation resources.
10. Create new day-use boating and camping areas.
11. Conduct an analysis of boating circulation to ensure that appropriate alternative routes are identified and clearly marked if boating circulation in the Delta is to be modified due to temporary, seasonal, or permanent channel closures or to speed restrictions.

12. Restore and design existing and new levees to accommodate vehicular access and parking for shoreline fishing, boat launching, swimming, hiking, bicycling, and wildlife viewing whenever feasible.

The Secretary finds that while the mitigation strategies described above will substantially lessen the permanent impact on boating access and navigation, based on currently available information, it is unclear whether this impact can be mitigated to less than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 5. Permanent closure of recreation facilities.

Ecosystem Restoration Program and Levee System Integrity Program actions could result in the temporary or permanent closure of certain recreation facilities, such as piers or marinas.

Operating fish and flow control barriers in the south Delta could restrict boat travel to marinas and fishing sites.

New or modified existing storage facilities could result in the permanent closure of recreation facilities.

A diversion facility on the Sacramento River and accompanying conveyance channel and channel modifications may result in the permanent displacement of land-based recreation opportunities including camping, hiking, and picnicking. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Incorporate project-level recreation improvements and enhancements.
2. Maintain boating access to prime areas.
3. Work with recreational interests to protect and enhance recreation resources.
4. Relocate or construct new recreation facilities and infrastructure.
5. Provide or improve vehicle access and parking for recreation areas.
6. Create new day-use boating and camping areas.
7. Conduct an analysis of boating circulation to ensure that appropriate alternative routes are identified and clearly marked if boating circulation in the Delta is to be modified due to temporary, seasonal, or permanent channel closures or to speed restrictions.
8. Restore and design existing and new levees to accommodate vehicular access and parking for shoreline fishing, boat launching, swimming, hiking, bicycling, and wildlife viewing whenever feasible.

Impact 6. Potential decrease in flooded lands suitable for wildlife, hunting, and fishing as a result of water use efficiency actions.

Water Use Efficiency Program measures could reduce agricultural return flows and after-harvest flooding of fields. This could reduce the extent of waterfowl habitat and affect recreational hunting and bird watching. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Incorporate project-level recreation improvements and enhancements.
2. Work with recreational interests to protect and enhance recreation resources.
3. Provide in-kind recreation facilities.
4. Relocate or construct new recreation facilities and infrastructure.
5. Purchase trail rights-of-way or recreational easements.

Impact 7. Reduced water-contact recreation quality from cold water reservoir releases.

Changes in reservoir operations resulting in increased cold-water flows could adversely affect water-contact recreation, such as swimming, tubing, canoeing, kayaking, rafting, windsurfing, and the use of personal watercraft, downstream of reservoirs. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Incorporate project-level recreation improvements and enhancements.
2. Work with recreational interests to protect and enhance recreation resources.
3. Provide or improve vehicle access and parking for recreation areas.
4. Provide access to waterfront areas and island edges.
5. Create new day-use boating and camping areas.

Impact 8. Displacement of fish and wildlife and loss of terrestrial and loss of on-stream recreation from new off-stream or expanded on-stream reservoirs.

New or expanded storage facilities could impact existing recreation resources, including fishing, wildlife viewing, camping, and boating, due to inundation or other impacts related to construction.

Flooding of reservoir sites could displace fish and wildlife from existing recreation areas. This may result in increased usage of other recreational facilities in the area. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:
1. Incorporate project-level recreation improvements and enhancements.
2. Work with recreational interests to protect and enhance recreation resources.
3. Purchase trail rights-of-way or recreational easements.
4. Provide or improve vehicle access and parking for recreation areas.
5. Create new day-use boating and camping areas.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear whether this impact can be mitigated to less than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 9. Potential for reduced access to recreation facilities and decreased recreation opportunities from changes in reservoir levels.

Changes in reservoir operations related to water transfers, water supply needs, or fish recovery could affect existing minimum pool levels and adversely affect recreational opportunities related to specific water surface elevations, including access to marinas and boat launching facilities. Changes in reservoir levels could also decrease the quality of the recreational experience and could result in decreased visitation, affecting businesses. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Incorporate project-level recreation improvements and enhancements.
2. Work with recreational interests to protect and enhance recreation resources, given regulatory and other operational constraints.
3. Provide in-kind recreation facilities.
4. Maintain reservoir levels as high as feasible during the recreation season, given regulatory and other operational constraints.
5. Minimize water level fluctuation and establish minimum pool levels, given regulatory and other operational constraints.
6. Create new day-use boating and camping areas.

Impact 10. Potential short-term construction impacts of dredging, such as obstructing or closing channels and creating noise and visual impacts.

Dredging for levee improvement and conveyance actions could result in short-term construction impacts, such as obstructing or closing channels and creating noise and visual impacts. Noise and visual impacts are addressed in Sections 5.6 and 7.13. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategy:

1. Avoid construction during peak-use seasons and times.

Section 7.8 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Flood Control Associated with the Preferred Program Alternative

Impact 1. Impacts on levee stability from levee and berm vegetation management practices for habitat purposes.

Reduced levee and berm vegetation management practices may result in significant and adverse long-term impacts on levee stability. Reduced pruning and clearing would allow more deep roots to penetrate levees and more dense vegetative canopies on levee surfaces. Dense vegetation could substantially reduce inspection capabilities by hiding rodent holes, cracks, or other potential causes of levee degradation. Thick understory vegetation also would limit access to levee side slopes, thereby reducing maintenance, repair, and emergency response capabilities. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Allow reasonable clearing of deep-rooted trees and shrubs from levee side slopes to support inspection, maintenance, repair, and emergency response, while preserving habitat values.
2. Permit clearing of deep-rooted shrubs and trees on levee side slopes. Trees and shrubs should be allowed to grow only on adjacent berms. If roots penetrate levees, fill materials should be added to levee landside slopes in order to construct a partial setback levee and increase stability.
3 Incorporate flood control criteria into the design of stream bank revegetation projects. For example, by increasing the width of vegetated sections to maintain conveyance capacity, the net effect of vegetation on flood control would be negligible.
4. Improve levees to withstand expected hydraulic stresses and seepage.

Impact 2. Reduced levee stability from habitat restoration using conservation easements along riparian corridors.

Habitat restoration using conservation easements along riparian corridors could reduce levee stability. Over time, deep-rooted and dense riparian trees and shrubs could increase the opportunity for roots to penetrate levees. Increased cracking and fissures could allow water to enter the levee interior, resulting in reduced structural stability. Small cracks, fissures, and root voids also could allow increased seepage beneath the levee, which could decrease levee stability. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Allow reasonable clearing of deep-rooted trees and shrubs from levee side slopes to support inspection, maintenance, repair, and emergency response, while preserving habitat values.
2. Permit clearing of deep-rooted shrubs and trees on levee side slopes. Trees and shrubs should be allowed to grow only on adjacent berms. If roots penetrate levees, fill materials should be added to levee landside slopes in order to construct a partial setback levee and increase stability.
3. Incorporate flood control criteria into the design of stream bank revegetation projects. For example, by increasing the width of vegetated sections to maintain conveyance capacity, the net effect of vegetation on flood control would be negligible.
4. Improve levees to withstand expected hydraulic stresses and seepage.

Impact 3. Increased seepage on adjacent islands, possibly leading to flooding from seepage-induced failure from shallow flooding of Delta islands susceptible to subsidence.

Shallow flooding of Delta islands susceptible to subsidence could significantly and adversely increase seepage on adjacent islands, and lead to substantial flooding from seepage-induced failure. In-Delta storage would increase hydraulic head at the storage site and may increase seepage on adjacent islands. In turn, this seepage may lead to piping and the loss of levee material, which could lead to levee instability. Related seepage impacts to groundwater, soils, and agricultural land are addressed in Sections 5.4, 5.5, and 7.1. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Identify locations susceptible to seepage-induced failure on Delta islands that may be intentionally flooded for habitat.
2. Implement a seepage monitoring program on nonflooded islands adjacent to potential shallow-flooded islands.
3. Develop seepage control performance standards to be used during island flooding and storage periods to determine net seepage caused by shallow flooding.
4. Improve levees to withstand expected hydraulic stresses and seepage.
5. Install relief wells near the toes of existing levees on neighboring lands.
6. Construct toe berms with an internal drainage system on neighboring lands.
7. Lower the pool elevation on the storage islands.
8. Develop wetland easements adjacent to levees on neighboring islands.

9. Construct a combination of seep and interior ditches and increase pumping rates, install clay blankets, and install impervious cutoff walls through storage island levees.

Impact 4. Increases in wind-fetched and wave erosion on landside levee slopes from island flooding.

Island flooding results in significant increases in wind-fetch and wave erosion on landside levee slopes. Waterside slopes also could experience significant erosion from increased wind-fetch and waves if the existing levees are not left intact. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Design erosion protection measures to minimize or eliminate wave splash and run-up erosion.
2. Use rip rap or another suitable means of slope protection to dissipate wave force.
3. Construct large wind/wave breaks in the flooded islands to reduce wind-fetch and erosion potential.
4. Control boat traffic in order to reduce boat wakes to levels that will not cause levee or bank erosion.
5. Coordinate erosion protection measures and wave force dissipation measures with the Ecosystem Restoration Program to minimize adverse impacts to revegetation efforts.

Impact 5. Increased levels of flooding downstream of diversions after removal of diversion structures and other obstructions to flow in the Sacramento River tributaries.

Removing diversion structures and other obstructions to flow in the Sacramento River tributaries could increase the level of flooding downstream of these diversions. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Widen streams downstream of removed water diversion structure to increase conveyance capacity.

2. Implement flood management measures including dredging, levee maintenance, and snag removal.

Impact 6. Increased flood stages along small streams due to increases in the roughness of the stream channel from vegetation on stream banks.

Reestablishing riparian habitat or preventing the removal of riparian vegetation would increase the roughness of the stream channel and could increase flood stages on smaller streams. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategy:

1. Incorporate flood control criteria into the design of stream bank revegetation projects. For example, by increasing the width of vegetated sections to maintain conveyance capacity, the net effect on flood control would be negligible.

Impact 7. Levee slumping and cracking caused by groundwater overdraft and subsidence.

Groundwater transfers or surface water transfers based on groundwater substitution could result in lower groundwater levels and land subsidence. If improperly managed, groundwater storage programs could result in significant adverse impacts associated with overdrafting the aquifer, including land subsidence. Water use efficiency measures may require more frequent water deliveries and could result in increased groundwater pumping and localized ground subsidence. Pumping and subsidence occurring near levees or other flood control facilities could cause settlement of the underlying substrate, resulting in levee slumping or cracking, or more significant damage. Third-party impacts are also discussed in Sections 7.2 and 7.14. Impacts on soils are addressed in Section 5.5. Groundwater impacts are addressed in Section 5.4. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Identify existing or planned wells that could affect groundwater and substrate conditions underlying nearby levees or flood control devices.
2. Support local groundwater management planning that reduces overdraft and third-party impacts.
3. Support local agencies in distributing groundwater pumping over a wide region rather than to a concentrated area to minimize drawdown of the aquifer.
4. Provide incentives to terminate use of wells that can adversely affect levee stability, reduce their pumping volume to safe withdrawal levels as they affect substrate stability, or otherwise replace them with sources that could not affect levee stability.

Impact 8. Increased stage upstream of and possible decreased stage downstream from gate structures located in channels that reduce the channel's flood flow conveyance.

Levee setbacks and removals associated with the conveyance element could result in two impacts. Lower water surface elevations could result in a steeper hydraulic gradient and higher flow velocities immediately upstream of the levee removal location. Lower water surface elevations could also change the flow distribution, possibly increasing the volume of water that discharges through adjacent channels. Gate structures located in channels could reduce the channel's flood flow conveyance, resulting in increased stage upstream of the structures and possibly decreased stage downstream. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Design structures to minimize the loss of channel conveyance at gate structures located in channels.
2. Implement flood management measures including dredging, levee maintenance, and snag removal.

Section 7.11 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Cultural Resources Associated with the Preferred Program Alternative

Impact 1. Impacts on cultural resources from construction, excavation, fill and flooding.

Implementing the Ecosystem Restoration Program, including revegetation projects, improved fish passage, eradication of undesirable plant species, establishment of shallow water habitat, gravel replacement, new floodways, levee setbacks, and creating aquatic and wetland habitat, could impact cultural resources. Clearing or replanting vegetation, if not performed with hand tools, could adversely affect historic properties or important cultural resources located in areas to be cleared or restored.

Levee construction activities could affect cultural resources due to the extensive earth movement required and the proximity to water sources.

Activities associated with the Watershed Program, including minor construction and revegetation, could impact National Register of Historic Places-eligible properties, historic resources, or unique archeological resources. Vandalism and looting of artifacts could result from Watershed Program actions that increase access to locations where cultural resources are present.

Surface storage reservoirs and groundwater storage could result in major construction-related impacts and impacts associated with flooding certain tracts, acquiring land, and relocating certain facilities that may hold historic significance.

Earth moving associated with Conveyance actions, such as setting back levees, dredging and enlarging channels, or widening portions of the Mokelumne River, and the construction of the diversion facility and flow and stage control barriers, could affect cultural resources.

Dredging may increase the likelihood of encountering possible ship wrecks or other underwater cultural resource features. Disposal of dredged spoils could affect buried and surface archeological sites. This impact is considered significant.

Collectively, implementation of the following mitigation strategies will reduce the Program's impacts on cultural resources to less than significant. The appropriate mitigation for specific actions will be determined following project-specific evaluation and compliance. Federal actions must comply with the National Register of Historic Places (36 C.F.R. 800.16[l]). State actions must comply with the California Environmental Quality Act (Pub. Resources Code Sections 21084.1 and 21083.2; CEQA Guidelines Section 15064.5[a]).

Mitigation Strategies:

1. Conduct cultural resource inventories.
2. Avoid sites through project redesign.
3. Map sites prior to undertaking actions that affect cultural resources.
4. Conduct surface collections.
5. Perform test excavations.

6. Probe for potentially buried sites.
7. Prepare reports to document mitigation work.
8. Conduct full-scale excavation of sites slated for destruction as a result of projects.
9. Prepare public interpretive documents.
10. Document historic structures by preparing Historic Engineering Records or Historic American Building Surveys.
11. Conduct ethnographic studies for traditional cultural properties.

Impact 2. Alteration of the historic setting of a cultural resource.

Implementing the Ecosystem Restoration Program, including revegetation projects, improved fish passage, eradication of undesirable plant species, establishment of shallow water habitat, gravel replacement, new floodways, levee setbacks, and creating aquatic and wetland habitat, could impact cultural resources. Clearing or replanting vegetation, if not performed with hand tools, could adversely affect historic properties or important cultural resources located in areas to be cleared or restored.

Levee construction activities could affect cultural resources due to the extensive earth movement required and the proximity to water sources.

Activities associated with the Watershed Program, including minor construction and revegetation, could impact NRHP-eligible properties, historic resources, or unique archeological resources. Vandalism and looting of artifacts could result from Watershed Program actions that increase access to locations where cultural resources are present.

Surface storage reservoirs and groundwater storage could result in major construction-related impacts and impacts associated with flooding certain tracts, acquiring land, and relocating certain facilities that may hold historic significance.

Earth moving associated with Conveyance actions, such as setting back levees, dredging and enlarging channels, or widening portions of the Mokelumne River, and the construction of the diversion facility and flow and stage control barriers, could affect cultural resources.

Dredging may increase the likelihood of encountering possible ship wrecks or other underwater cultural resource features. Disposal of dredged spoils could affect buried and surface archeological sites. This impact is considered significant.

Collectively, implementation of the following mitigation strategies will reduce the Program's impacts on cultural resources to less than significant. The appropriate mitigation for specific actions will be determined following project-specific evaluation and compliance. Federal actions must comply with the National Register of Historic Places (36 C.F.R. 800.16[l]). State actions must comply with the California Environmental Quality Act (Pub. Resources Code Sections 21084.1 and 21083.2; CEQA Guidelines Section 15064.5[a]).

Mitigation Strategies:

1. Conduct cultural resource inventories.
2. Avoid sites through project redesign.
3. Map sites prior to undertaking actions that affect cultural resources.
4. Conduct surface collections.
5. Perform test excavations.
6. Probe for potentially buried sites.
7. Prepare reports to document mitigation work.
8. Conduct full-scale excavation of sites slated for destruction as a result of projects.
9. Prepare public interpretive documents.
10. Document historic structures by preparing Historic Engineering Records or Historic American Building Surveys.
11. Conduct ethnographic studies for traditional cultural properties.

Section 7.12 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Public Health and Environmental Hazards Associated with the Preferred Program Alternative

Impact 1. Short- and long-term increases in mosquito breeding habitat from wetland restoration activities and fluctuating water levels.

Actions associated with the Ecosystem Restoration Program could increase the amount of mosquito breeding habitat in the Delta, Bay, Sacramento River, and San Joaquin River Regions. For example, expanding floodplains in the Delta could leave areas of standing shallow water when water levels decline, which would provide mosquito breeding grounds. Converting agricultural land to wetland and other habitat and seasonally flooding agricultural land also could increase standing water. Some levee reconstruction could create riparian and wetland habitat, resulting in permanent or temporary (during construction) standing water, in turn increasing mosquito breeding habitat.

Channel widening, island flooding, and water project operation changes resulting in fluctuating water levels associated with storage and conveyance actions could create pockets of standing water that could provide mosquito breeding habitat. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Use various mosquito control methods, such as biological agents, chemical agents, and ecological manipulation of mosquito breeding habitat.
2. Support actions to establish or find funding for mosquito abatement activities.
3. Remove or disturb water that remains stagnant for more than 3 days at a construction site.
4. Limit construction to cool weather, when mosquito production is lowest.
5. Limit construction to periods of low precipitation to avoid pools of standing water.

Impact 2. Increased risk of groundwater and surface water contamination from naturally occurring or spilled hazardous materials and from improper handling of hazardous materials.

Water use efficiency improvements may result in the long-term operation of pumping equipment for groundwater wells. The risk of long-term groundwater contamination from naturally occurring or spilled hazardous materials, such as the gasoline or propane stored to run the pumps, could increase if groundwater pumps in operation for longer periods were not routinely maintained and inspected. Construction activities associated with Storage and Conveyance elements could expose people to hazardous materials and waste, such as PCBs, petroleum products, pesticides, and metals. Impacts

could be caused by exposure to naturally occurring or spilled hazardous materials, or by subsurface disturbance of contaminated sites. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategy:
1. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.
2. Increase monitoring activities to ensure that groundwater pumping equipment is operating to existing standards.

Impact 3. Increased exposure to hazardous materials and waste from construction activities related to storage and conveyance projects and other Program elements.

Some levee reconstruction could create riparian and wetland habitat, resulting in permanent or temporary (during construction) standing water. The presence of standing water could increase the risk of exposure to hazardous materials and waste. In addition, dredging could increase the exposure to hazardous materials from placement of contaminated dredged spoils near population centers and changes in hydrology that could affect the dispersion of hazardous materials. Construction activities associated with Storage and Conveyance elements could expose people to naturally occurring or spilled hazardous materials, or by subsurface disturbance of contaminated sites hazardous materials. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.
2. Increase monitoring activities to ensure that groundwater pumping equipment is operating to existing standards.
3. Limit or coordinate construction activities to favorable weather conditions to forestall dispersing hazardous materials.
4. Conduct core sampling and analysis of proposed dredge areas and engineer solutions to avoid or prevent environmental exposure to toxic substances after dredging.
5. Cap exposed toxic sediments with clean clay/silt and protective gravel.

Impact 4. Increases in water quality degradation, resuspension of contaminants, and exposure to hazardous materials from dredging activities.

Dredging may result in temporary water quality degradation, resuspension of contaminants, potential exposure to hazardous materials from placement of contaminated dredged spoils near population centers, and changes in hydrology that could affect the dispersion of hazardous materials. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.
2. Limit or coordinate construction activities to favorable weather conditions to forestall dispersing hazardous materials.
3. Conduct core sampling and analysis of proposed dredge areas and engineer solutions to avoid or prevent environmental exposure to toxic substances after dredging.
4. Cap exposed toxic sediments with clean clay/silt and protective gravel.
5. Use cofferdams to construct levees and channel modifications in isolation from existing waterways.
6. Use sediment curtains to contain turbidity plumes during dredging.

Impact 5. Increases in levels of methyl mercury released into the Bay-Delta ecosystem from wetland restoration, levee rehabilitation activities and conveyance actions.

Program actions such as wetlands restoration in areas that contain or trap mercury deposits could promote methylation, the process that causes the conversion of inorganic mercury to methyl mercury, causing an increase in the levels of methyl mercury in the Bay-Delta ecosystem. In addition, channel widening and island flooding could disturb sediments contaminated with mercury, increasing the levels of mercury in the Bay-Delta ecosystem. Delta island flooding could produce similar methylation processes as those described for the Ecosystem Restoration Program. Dredging as a component of the Levee System Integrity Program and conveyance improvements could resuspend sediments contaminated with mercury, increasing the levels of mercury in the Bay-Delta ecosystem. The bioaccumulation of toxic methyl mercury in food webs can impact consumers of aquatic organisms, specifically through the consumption of fish caught in the Bay-Delta. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:

1. Follow established and proper procedures and regulations for identifying, removing and disposing of contaminated materials.
2. Modify engineering plans to minimize mercury related problems.
3. Conduct core sampling and analysis of proposed dredge areas and engineer solutions to avoid or prevent environmental exposure to toxic substances after dredging.
4. Cap exposed toxic sediments with clean clay/silt and protective gravel.
5. Locate constructed shallow-water habitat away from sources of mercury until methods for reducing mercury in water and sediment are implemented.
6. Fund research to identify where these impacts may occur in the solution area.

Section 7.13 Findings on Specific Impacts and Mitigation Measures: Potentially Significant Adverse Impacts on Visual Resources Associated with the Preferred Program Alternative

Impact 1. Long-term visual impacts of new facilities or modified existing facilities.

New levees and embankments could visually dominate the surrounding flat, open landscape and could permanently change the visual quality and character of the project area.

Water storage facilities could include the presence of constructed linear and obtrusive features (such as dams and spillways); view obstructions; and fluctuating water levels, creating a bathtub ring effect. Water diversion and conveyance facilities could include the presence of constructed linear and obtrusive features (such as inlet structures, fish screens, pipelines, and siphons) and could obstruct views. Flow control barriers in the south Delta could impede boater access to scenic areas. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:

1. Time changes in flow regimes to minimize "bathtub ring" effects during times of peak recreation use.
2. Locate and direct exterior lighting for construction activities so that it is concealed to the extent practicable when viewed from local roads, nearby communities, and any recreation areas.
3. Site proposed reservoir(s), if possible, to minimize required cut and fill and locate the reservoir on the flattest topographic section of the site to minimize its visibility.
4. Construct facilities with earth-tone building materials or other visually aesthetic design materials.
5. Locate visually obtrusive features, such as burrow pits and dredged material disposal sites, outside visually sensitive areas and observation sites.
6. Select vegetation type, placement, and density to be compatible with patterns of existing vegetation where revegetation occurs in natural areas. Vegetation such as emergent marsh grasses that can tolerate periodic flooding and drying may be useful.
7. Install landscape screening, such as grouped plantings of trees and tall shrubs, to screen proposed facilities from nearby sensitive viewers.
8. Use native trees, bushes, shrubs, and ground-cover for landscaping, when appropriate, at facilities such as dams and pumping-generating plants, and along new and expanded canals and conveyance channels, in a manner that does not compromise facility safety and access.
9. Create view opportunities of outstanding features through selective vegetation reduction or constructing roadside viewing areas.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear that this impact can be mitigated to less

than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

Impact 2. Impacts in visually sensitive areas from restoration actions.

Some ERP actions could result in adverse impacts, such as fencing creeks to protect riparian vegetation, creating borrow pits for gravel replacement, and installing fish screens. This impact could be significant if it persisted for five years or more and occurred in visually sensitive areas. This impact is considered significant.

Implementation of the following mitigation strategy will reduce this impact to less than significant.

Mitigation Strategies:
1. Construct facilities with earth-tone building materials or other visually aesthetic design materials.
2. Locate visually obtrusive features, such as borrow pits, dredged material disposal sites and fences, outside visually sensitive areas and observations sites.
3. Recontour and add vegetation to areas rated as "poor" in variety class.

Impact 3. Degraded watershed views from such actions as erosion control and fire management practices.

The Watershed Program will form partnerships with and provide technical training and support to local watershed groups. Watershed group activities may include erosion control measures, revegetation of degraded habitat, and fire and fuel load management. These activities could degrade views. The Watershed Program does not include timber harvest actions and will not affect existing timber harvesting requirements. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Water areas where dust is generated, particularly along unpaved haul routes and during earth-moving activities, to reduce visual impacts caused by dust.
2. Avoid unnecessary ground disturbance outside the necessary construction area.
3. Revegetate disturbed areas as soon as possible after construction.

4. Create view opportunities of outstanding features, selective vegetation reduction, or constructing roadside viewing areas.
5. Recontour and add vegetation to areas rated as "poor" in variety class.

Impact 4. Creation of borrow pits or spoils material disposal sites associated with storage, conveyance, levee projects, and other Program actions.

Creation of borrow pits or spoils material disposal sites associated with storage, conveyance, levee projects, and other Program actions could be significant if the visual impacts persisted for five years or more and occurred in visually sensitive areas. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact to less than significant.

Mitigation Strategies:
1. Revegetate disturbed areas as soon as possible after construction.
2. Locate visually obtrusive features, such as borrow pits and dredged material disposal sites, outside visually sensitive areas and observations sites.
3. Select vegetation type, placement, and density to be compatible with patterns of existing vegetation where revegetation occurs in natural areas.
4. Install landscape screening, such as grouped plantings of trees and tall shrubs, to screen proposed facilities and along new and expanded canals and conveyance channels, in a manner that does not compromise facility safety and access.
5. Use native trees, brushes, shrubs, and groundcover for landscaping at facilities such as dams and pumping-generating plants, and along new canals and conveyance channels.
6. Recontour and add vegetation to areas rated as "poor" in variety class.

Impact 5. Long-term visual impacts from construction activities extending more than 5 years.

Reservoir facility construction could create temporary or long-term adverse visual impacts, particularly from haul routes, night construction lighting, and construction staging areas. Nearby views of project features under construction could impose temporary visual impacts caused by heavy equipment generating dust and disturbing established topography and vegetation. Short-term adverse impacts on visual quality associated with construction of water storage facilities could include construction grading and removing existing vegetation and habitat. Most of the construction areas for any storage facilities eventually would be inundated, but in some cases the visual impacts could last more than 5 years. This impact is considered significant.

Implementation of the following mitigation strategies will reduce this impact.

Mitigation Strategies:

1. Time changes in flow regimes to minimize "bathtub ring" effects during times of peak recreation use.
2. Minimize construction activities during the peak-use recreation season.
3. Water areas where dust is generated, particularly along unpaved haul routes and during earth-moving activities to reduce visual impacts caused by dust.
4. Avoid unnecessary ground disturbance outside the necessary construction area.
5. Locate and direct exterior lighting for construction activities so that it is concealed to the extent practicable when viewed from local roads, nearby communities, and any recreation areas.
6. Revegetate disturbed areas as soon as possible after construction.
7. Locate visually obtrusive features, such as borrow pits and dredged material disposal sites, outside visually sensitive areas and observation sites.
8. Recontour and add vegetation to areas rated as "poor" in variety class.

The Secretary finds that while the mitigation strategies described above will substantially lessen this impact, based on currently available information, it is unclear that this impact can be mitigated to less than significant. Therefore, for purposes of this programmatic document, this impact is considered significant and unavoidable.

B. Mitigation Measures Not Adopted/Rejected

The following mitigation measures recommended in comments on the EIS/EIR are either (1) not adopted because they are inappropriate, or (2) rejected as infeasible due to specific economic, technological, or other considerations.

Reasons for not adopting recommended mitigation measures include:

1. The measure is similar to mitigation measure(s) already incorporated;
2. The measure is less effective than mitigation measures already incorporated;
3. The measure is ineffective in mitigating the adverse effect;
4. The measure is too project-specific for a programmatic document;
5. The measure addresses an impact not caused by the CALFED Program; or
6. The measure does not address an impact on the environment.

A mitigation measure may be rejected as infeasible if it is "[in]capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." Pub. Resources Code Section 21061.1. Legal or other factors, such as providing employment opportunities, may also be considered in making a finding of infeasibility. See Pub. Resources Code Section 21081; see also CEQA Guidelines Section 15091 (a)(3).

Section 5.2, Hydrodynamics and Hydraulics

Measure Similar to Ones Already Incorporated. The following mitigation measure was not adopted because it is similar to, and therefore duplicative of, mitigation measures already incorporated and adopted by the Secretary.

- Provide mitigation strategies aimed at reducing significant impacts to Bay-Delta hydrodynamics and riverine hydraulics (e.g., unacceptable velocity increases) in Section 5.2.

Mitigation strategies are not included in Section 5.2 because the section only describes the hydrodynamic and hydraulic modeling used for the environmental analysis. The environmental impacts resulting from hydrodynamic and hydraulic changes are addressed in other sections of the EIS/EIR in the context of each of the resources affected. For example, impacts on water quality, soils, fisheries and aquatic ecosystems, and flood control and appropriate mitigation strategies are addressed in Sections 5.3, 5.5, 6.1, and 7.8, respectively.

Section 5.3, Water Quality

Measures Similar to Ones Already Incorporated. The following mitigation measures were not adopted because they are similar to, and therefore duplicative of, mitigation measures already incorporated and adopted by the Secretary.

- Implement source control and offset increasing loads to treatment plants due to water transfers and water conservation as a measure to reduce total dissolved solids (TDS).

- Include mitigation strategies for the potential increase in organic carbon, bacteria, and pathogens from the Ecosystem Restoration Program.

To the extent Program actions would result in increases of constituents of concern such as TDS, total organic carbon (TOC) and pathogens, mitigation strategies in Section 5.3, including treating wastewater at the source, upgrading water treatment processes, and applying agricultural and urban Best Management Practices, will reduce these impacts to less than significant. The recommended mitigation measures are therefore not adopted.

Measures that Address an Impact Not Caused by the CALFED Program. The following mitigation measures were not adopted because they address an environmental impact not caused by the CALFED Program.

- Mitigate the selenium impacts of refineries and municipalities in the North Bay area by assisting with financing a drainage facility for San Joaquin Valley selenium loads.

Selenium impacts are not caused by the CALFED Program. This comment addresses existing selenium impacts of refineries and municipal treatment facilities, not CALFED actions. However, CALFED includes actions such as agricultural land retirement in the western San Joaquin Valley to reduce the adverse effects of selenium in order to reach its primary objectives for water quality and ecosystem quality. This mitigation strategy is therefore not adopted.

- Include mitigation measures to address bromide reduction to the State Water Project, such as real time operational flexibility of the export pumps as a means for reducing export of bromide and salinity.

Bromide is an existing constituent of concern which enters the Delta through the intrusion of seawater through the Bay. The impacts of bromide on water quality in the State Water Project is not caused by CALFED Program actions. However, CALFED includes actions such as real-time management of the export pumps to meet water quality objectives. This mitigation strategy is therefore not adopted.

Section 5.7, Transportation

Measure Ineffective in Mitigating the Adverse Effect. The following mitigation measure was not adopted because it is ineffective in mitigating adverse environmental effects.

- Require future EIRs and EISs for project-specific actions to include traffic assessments and analysis of traffic associated with increases in recreational opportunities resulting from new reservoirs, and other land conversions to recreational uses.

All CALFED second-tier projects will be required to meet the requirements of CEQA and NEPA. Traffic analyses do not mitigate transportation impacts, but they may be used to identify the need for project-specific mitigation measures. Traffic analyses may be required for certain second-tier projects. However, not every action that increases recreational uses will require traffic analyses, making it inappropriate to adopt this mitigation measure at the programmatic level. This mitigation strategy is therefore not adopted.

Section 5.8, Air Quality

Measure Similar to Ones Already Incorporated. The following mitigation measure was not adopted because it is similar to, and therefore duplicative of, mitigation measures already incorporated and adopted by the Secretary.

- Work with local and regional planning jurisdictions to identify areas subject to agricultural land conversion for advance planning for air quality impacts.

Mitigation strategies 4, 11, and 21 on pages 7.1-2, 3 in the EIS/EIR address this suggestion. This mitigation strategy is therefore not adopted.

Section 6.2, Vegetation and Wildlife

Measure Similar to Ones Already Incorporated. The following mitigation measure was not adopted because it is similar to, and therefore duplicative of, mitigation measures already incorporated and adopted by the Secretary.

- The mitigation strategies should discuss need for additional action at the project-specific level if program actions disturb special-status species or protected habitats.

This recommendation is addressed by the adopted Mitigation Monitoring Plan discussed in Chapter 9 of the EIS/EIR and Section V of these CEQA Findings and the Record of Decision. CALFED will monitor all mitigation measures through the Science Program. This mitigation measure is therefore not adopted.

Section 7.1, Agricultural Land and Water Use

Measures Similar to Ones Already Incorporated. The following mitigation measures were not adopted because they are similar to, and therefore duplicative of, mitigation measures already incorporated and adopted by the Secretary.

- Meet Program goals by maintaining land in private ownership, rather than through government purchase.

Mitigation strategies 9, 10, and 14 on pages 7.1-2, 3 in the EIS/EIR address this suggestion.

- Work with local landowners and organizations in planning and developing projects.

Mitigation strategies 4, 11, and 21 on pages 7.1-2, 3 in the EIS/EIR address this suggestion.

- Maintain the productivity and flexibility of agricultural lands to the greatest extent practicable when implementing the entire Program.

This suggestion is too general to be an effective mitigation measure as defined by CEQA. However, several mitigation strategies in Section 7.1.11, such as "Restoring existing degraded habitat as a priority before converting agricultural land," would assist in serving this purpose.

- Require buffers when developing habitat projects adjacent to agricultural uses.

This recommendation is addressed by mitigation strategy 19 on page 7.1-3 in the EIS/EIR. Specifics on buffer design must be developed at the project-specific level.

- Establish an easement or transfer of development rights program.

The State of California already has developed such a program, the California Farmland Conservancy Program that is administered by the Department of Conservation. This is addressed in mitigation strategy 8 on page 7.1-2 in the EIS/EIR.

- Phase implementation of specific Program components.

This is addressed by mitigation strategy 17 in Section 7.1.11. This strategy would allow implementation to proceed as needed, rather than happening all at once.

- Establish an agricultural mitigation oversight entity to oversee implementation of mitigation by CALFED.

This recommendation is addressed by the adopted Mitigation Monitoring Plan discussed in Chapter 9 of the EIS/EIR and Section V of these CEQA Findings and the Record of Decision. The CALFED Agencies will monitor all mitigation measures through project-specific lead agencies and the Science Program. This mitigation measure is therefore not adopted.

Measures Ineffective in Mitigating the Adverse Effect. The following mitigation measures were not adopted because they are ineffective in mitigating adverse environmental effects.

- Implement a Planned Unit Development approach to habitat development.

Planned Unit Developments are urban planning designations that allow large tracts of housing or commercial development to set their own development standards outside normal zoning ordinances. The comment provides insufficient information to evaluate how Planned Unit Developments could apply as a mitigation strategy.

- Require comprehensive environmental evaluation for projects that will adversely affect agricultural lands, using the NRCS Land Evaluation and Site Assessment (LESA) system.

All CALFED second-tier projects will be required to meet the requirements of CEQA and NEPA. LESA may be used by Federal agencies, as appropriate for the scale of project, and can optionally be used by State agencies. LESA evaluates various aspects of the agricultural site proposed for development, including the quality of soils and size of parcel. However, LESA is designed to gauge the impacts of urban-type development and may be misleading if used to measure the significance of projects such as wildlife habitat creation. For instance, one of the criterion contained in LESA for measuring the effects of a project is the distance from existing urbanization—the further from an urbanized area, the greater the score for agricultural land impacts. While this is an appropriate measure to judge the impacts of urbanization and to evaluate the growth-inducing potential of a project, it is an inappropriate measure to evaluate the significance of habitat conversion projects. Habitat projects usually are not near existing urbanization and do not contribute to growth inducement. Therefore, the full or partial use of LESA may or may not be appropriate at the project-specific level but should not be required.

Measures Too Project Specific for Programmatic Document. The following measures are too project-specific for a programmatic document. In developing project-specific mitigation measures in second-tier environmental documents, CALFED agencies will continue to consider any appropriate measures that help avoid or reduce environmental impacts.

- Provide development agreements to support remaining agricultural lands when a project results in agricultural land conversion.

It is unclear what type of impact this measure would mitigate. It appears to be a separate agreement to carry out mitigation measures at the project-specific level. Project-specific mitigation measures will be included in second-tier environmental documents, as appropriate, with the required measures, such as conditions of approval, to monitor such mitigation. It is unclear what purpose would be served by a second document memorializing these mitigations.

- Develop specific mitigation measures for the Ecosystem Restoration Program.

The Ecosystem Restoration Program Plan includes categories of projects and generalized potential project locations. The plan does not provide project-specific information, such as precise map locations and acreages, that would be required in a project-specific environmental document. Because locations in the Ecosystem Restoration Program Plan (for example, Yolo Bypass) are currently general, project-specific impacts cannot be determined. Likewise, more detailed mitigation measures for those impacts cannot be determined until more detail on the project is available. The EIS/EIR contains a large number of mitigation strategies for agricultural impacts, which must be used by individual project lead agencies in determining mitigation measures for second-tier projects. Section 7.1.11 includes 27 mitigation strategies for impacts due to agricultural land conversion and local planning impacts; Sections 7.2 and 7.3 include an additional 19 mitigation strategies to reduce adverse agricultural economic and social effects.

- Purchase flood easements and repair existing levees rather than developing setback levees.

Decisions on how best to increase flood protection for lands behind specific levees have not yet been made. The Long-Term Levee Protection Plan includes levee strengthening and setback levees as options. The merits and liabilities of setting back levees will be closely scrutinized, and the use of setback levees may not be feasible or desirable in many cases. Landowners and other stakeholders will be consulted during project formulation. At a programmatic level, the option to use setback levees is included in order to allow flexibility to achieve the primary objectives of ecosystem quality and levee system integrity, depending on the characteristics of the various second-tier levee projects.

- Direct habitat development to poorer quality agricultural soils.

Several mitigation strategies in Section 7.1.11, such as "restore existing degraded habitat as a priority before converting agricultural land," "focus restoration efforts on public lands before converting agricultural land," "focus restoration efforts on acquiring lands from willing sellers where part of the reason to sell is economic hardship," and "use farmer-initiated and developed restoration projects," would assist in serving this purpose. However, since the various habitat types have specific soils requirements, as do agricultural crops, this measure will not be appropriate for every habitat restoration action. While this measure will be considered for second-tier projects, it is not appropriate to adopt this mitigation measure at the programmatic level. This mitigation strategy is therefore not adopted.

Measures that Address an Impact Not Caused by the CALFED Program. The following mitigation measures were not adopted because they address an environmental impact not caused by the CALFED Program.

- Reaffirm the State's right-to-farm policy.

The right-to-farm statute was designed to prevent impacts on agriculture from encroaching urbanization and generally does not apply to the CALFED Program actions. In addition, reaffirming an existing statute is not a mitigation measure.

Measures that Do Not Address an Impact on the Environment. A number of mitigation measures recommended by commentators deal solely with changes in water use, and social or economic impacts. CEQA requires findings for impacts on changes to the physical environment only; therefore, mitigation measures that do not result in physical changes but affect water use, social and economic impacts are not included, but ways to reduce social and economic impacts are addressed in Sections 7.2 and 7.3. Accordingly, the following mitigation strategies are not adopted.

- Before implementing any action requiring additional water, develop the water source; if water is from former agricultural use, mitigate the significant environmental impact.

- Develop an Agricultural Water Account to mitigate for agricultural water directed to CALFED uses.

CALFED Agencies will, by necessity, need to identify and purchase water for projects before that water is applied. That is not a mitigation measure but a practical reality given California's water rights laws. The change in the amount of water used for agriculture apart from its effects on land use or other environmental effects, however, in itself is not an environmental impact under CEQA. See CEQA

Guidelines, Appendix G. As used in CEQA, the "existing environment" contains both natural and human-made features. Section 7.1 describes the existing environment as it pertains to agriculture. The term "water use" is vague and can be used in various contexts, some with associated environmental impacts. The environmental impacts resulting from a change in the amount of water use are addressed in other sections of the EIS/EIR in the context of each of the resources affected. For example, where changes in water use lead to loss of agricultural land, impacts to groundwater levels, or to water quality, those impacts are addressed in Sections 7.1, 5.4, and 5.3, respectively. Loss or conversion of agricultural land is considered a significant and unavoidable impact of the Program even though all feasible mitigation measures were adopted to reduce this impact. Economic and social effects of water transfers and other Program actions and ways to reduce these impacts are discussed in Sections 7.2 and 7.3, respectively.

- Pay fair market values.

Payment of fair market values does not address an environmental impact and is incorporated as a standard Program policy to minimize economic effects described on page 7.2-23 in the EIS/EIR.

- Scheduling construction activities to allow harvests.

Scheduling construction activities to allow harvests is incorporated as a standard Program policy to minimize economic effects and is described on page 7.2-23 in the EIS/EIR.

Mitigation Measures Rejected as Infeasible. The following mitigation measures are rejected as infeasible for specific economic, legal, environmental, social, technological, or other considerations.

- Establish Agricultural Exclusive zoning.

Establishing zoning is a local responsibility. CALFED Agencies have no authority to establish local zoning, even in conjunction with the Delta Protection Commission. This mitigation measure is therefore rejected for legal considerations. Moreover, it is unclear how agricultural zoning would mitigate for ecosystem restoration actions which affect agricultural land, as these types of activities would normally be allowed in agriculturally zoned areas.

- Increase subvention funding and property tax sharing and develop legislation for rural development zones.

Increased subvention funding and property tax sharing, and legislation for rural development zones are outside the abilities of the CALFED Agencies to implement at this time. These suggestions are more appropriately directed to the Legislature. This mitigation measure is therefore rejected for legal

considerations.

- When conversion occurs, remove Class I and II soils from the habitat site to other agricultural locations.

This measure could hamper ecosystem restoration progress because habitat types have soil requirements similar to agricultural crops. For instance, valley oak woodlands would not grow on hard, poorly drained soils. The costs of moving vast amounts of soils may not be justified by the gains from the receiving parcels and could limit the ability to restore the land to agricultural purposes in the future. Further, additional regulatory hurdles, such as triggering the Surface Mining and Reclamation Act, could make this mitigation even less economically feasible. This mitigation measure is therefore rejected for economic, legal and technological considerations and because it could cause new adverse environmental impacts.

- Require 1 acre of farmland to be protected for every acre converted.

Protection of off-site lands to mitigate conversions of farmlands is addressed in adopted mitigation strategy 8 of Section 7.1. However, the exact amounts to be protected would depend on the project-specific impacts of conversion, as measured in the second-tier environmental document. The feasibility of this mitigation strategy would also need to be evaluated at the project-specific level, and would depend on the number of voluntary participants in the easement program and the cost of acquiring the easements. At a programmatic level, the feasibility of this measure is too uncertain. This mitigation measure is therefore rejected for technical and economic considerations.

- Adopt a no-net-loss policy for agricultural land.

Because the Program will require agricultural lands in the Delta and elsewhere for Program purposes, a no-net-loss policy as suggested would require at least a 1:1 replacement as mitigation for any agricultural lands converted to Program purposes. This proposed mitigation is infeasible. Very few local governments have adopted payment of an in-lieu fee as a mitigation for protection of an equivalent amount of agricultural land to that which is converted. The cost of purchasing and providing land, irrigation infrastructure, and water as mitigation for agricultural land loss—which direct replacement would require—would make almost any project that is converting agricultural lands infeasible, whether for habitat or urban uses. In addition, irrigation of new lands can cause its own series of environmental impacts. For example, converting dry-farmed or grazed lands to monocultures such as vineyards can cause reduction in habitat for raptors and many other species. The Department of Conservation's Farmland Conversion Report - 1994 to 1996 states that most land converted from the Farmland of Local Importance category to the Unique Farmlands category in San Joaquin County were pasturelands planted to vineyards (2,179 acres). Most lands that are best for irrigated crops have already been irrigated. Currently unirrigated lands may have drainage problems or soil problems that

could cause even more impacts, such as the need for drains or a limited life due to leaching. Providing additional water can also increase demands on existing, overdrafted groundwater basins. (DWR Bulletin 160-98.) Providing infrastructure for irrigation and access would be costly and would also cause additional environmental impacts. This is especially costly where small isolated tracts of land are proposed for irrigation, and the infrastructure costs are not spread across a large number of beneficiaries. Section 7.1.12 describes farmland conversions caused by the Program as a potentially significant environmental impact at the programmatic level. The Program objectives to improve and increase terrestrial habitats in order to support sustainable populations of diverse and valuable plant and animal species in the Bay-Delta cannot be achieved without some creation of habitat on land currently used for agriculture. This mitigation strategy is therefore rejected as infeasible due to technical, economic, and legal considerations.

Section 7.12, Public Health

Measure that Addresses an Impact Not Caused by the CALFED Program. The following mitigation measure was not adopted because it addresses an environmental impact not caused by the CALFED Program.

- CALFED must include mitigation to assure that urban water agencies can cost-effectively treat water from the Delta for public health protection since there are no definite plans to construct an isolated facility.

CALFED actions will not reduce the quality of drinking water nor increase the cost of drinking water treatment. However, CALFED includes source control, water treatment facility improvements and other actions to protect public health. This mitigation strategy is therefore not adopted.

VII. CUMULATIVE IMPACTS

As used in CEQA, cumulative impacts "refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impacts analysis can identify impacts that "result from individually minor but collectively significant projects taking place over a period of time." CEQA Guidelines Section 15355. The analysis in this EIS/EIR considers the cumulative impacts of implementing the different actions included within the long-term Program, as well as the collective impacts of the Program actions considered in connection with impacts of other projects with similar impacts on related environmental resource areas.

The CALFED Program involves the approval at a broad planning level of a long-term program to restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The Program is a general description of potential actions that will be further refined, considered, and analyzed for project-specific environmental impacts as part of second-tier environmental documents prior to making a decision to carry out these later actions. The EIS/EIR focuses on a general overview of impacts of all of the associated actions and mitigation measures to avoid or reduce these impacts.

At the general programmatic planning level of analysis of this EIS/EIR, the incremental contribution of each of the many possible actions within the scope of the Program to cumulative impacts is difficult to separately analyze. Thus, the overall, long-term impacts of the Program as a whole are described in broad categories of impacts to which the various actions within the Program may contribute over the 30-year planning time frame. This analysis is designed to identify impacts to which various actions within the Program may contribute, and which might not be considered significant if individual project components were analyzed in isolation from each other, or in isolation from other past, present and probable future projects.

In general, the analysis of cumulative impacts is qualitative. Impacts were identified based on: (1) information extracted from existing environmental documents or studies for the resource categories potentially affected by each project, and (2) knowledge of expected effects of similar projects in the study area.

Cumulative Impact Analysis Screening Criteria. The CALFED Bay-Delta Program used the following criteria to identify reasonably foreseeable actions to be included in the cumulative impact analysis. The impacts of the related past and present actions are reflected in the description of existing conditions in the EIS/EIR. All of the criteria had to be met for an action to be included in the cumulative impact analysis.

Is the action under active consideration?

Does the action have recently completed environmental documentation or are environmental documents in some stage of completion?

Would the action be completed and operational within the time frame being considered for the CALFED Bay-Delta Program?

Does the action, in combination with the CALFED Bay-Delta Program action alternatives, have the potential to affect the same resources?

The reasonably foreseeable projects and programs considered in concert with the Preferred Program Alternative in this cumulative analysis include the following:

- American River Water Resource Investigation
- American River Watershed Project
- CVPIA (Ecosystem Restoration, Water Transfer, Water Use Efficiency, and Water Quality Programs)
- CCWD Multi-Purpose Pipeline Project
- Delta Wetlands Project (Ecosystem Restoration Program)
- Hamilton City Pumping Plant Fish Screen Improvement Project (Ecosystem Restoration Program)
- Interim South Delta Plan (ISDP) (Conveyance Element)
- Montezuma Wetlands Project (Ecosystem Restoration Program)
- Pardee Reservoir Enlargement Project
- Red Bluff Diversion Dam Fish Passage Program (Ecosystem Restoration Program)
- Sacramento River Flood Control System Evaluation (partial)
- Sacramento Water Forum Process (Ecosystem Restoration Program)
- Trinity River Restoration Program (proposed flows are included in modeling assumptions for the Preferred Program Alternative)

- EBMUD Supplemental Water Supply Project
- Sacramento County M&I Water Supply Contracts
- Urbanization (future population growth is included in modeling assumptions for the Preferred Program Alternative)
- West Delta Water Management Program (Ecosystem Restoration Program)
- Sacramento River Conservation Area Program (Ecosystem Restoration Program)

A more detailed description of these projects and programs in included in Attachment A to the EIS/EIR.

In general, the conclusions regarding the significance of the Preferred Program Alternative's contribution to cumulative impacts are the same as the conclusions regarding the Preferred Program Alternative's long-term impacts. This is due to the long-term nature of the Program, the size of the Program, and the wide range of related potential actions that fall within the scope of the Program. Many impacts of the Program that might not be significant if considered in a separate project-specific analysis of the individual actions that are part of the Program, are treated as significant at this programmatic level of review. In considering impacts from the Program together with impacts of other past, present and probable future projects, the cumulative impacts analysis did not identify any impacts which might cause an individually limited impact that by itself was not significant, but when considered together with other past, present, and probable future projects would be significant.

Although other related water projects considered in the cumulative impacts analysis may have the effect of reducing the availability of water supplies or water management options, the Preferred Program Alternative will not contribute to this impact. Based on the use of alternative water management tools, including water use efficiency measures, water recycling, and water transfers, as well as conveyance improvements, the Environmental Water Account, and new storage, the Preferred Program Alternative will improve water supply reliability and water management flexibility.

The Preferred Program Alternative is expected to contribute to cumulative impacts in the following resource areas which would be significant without mitigation: Water Supply and Water Management, Water Quality, Groundwater Resources, Geology and Soils, Noise, Air Quality, Urban Land Use, Utilities and Public Services, Flood Control, Cultural Resources, and Public Health and Environmental Hazards.

At the programmatic level of analysis, the CALFED Program's contribution to cumulative impacts resulting from environmental consequences in these resource areas are expected to be avoided, reduced, or mitigated to a less than cumulatively considerable level by the mitigation measures adopted. The description of the environmental consequences and the mitigation measures adopted in Section VI, Sections 5.1, 5.3, 5.4, 5.5, 5.6, 5.8, 7.4, 7.6, 7.8, 7.11, 7.12 of these findings are hereby incorporated by reference as descriptive of the Program's contribution to cumulative impacts and adopted as mitigation measures for the Program's contributions to cumulative impacts.

The Preferred Program Alternative would contribute to cumulative impacts in the following resource areas which would remain significant even with the mitigation measures adopted: Transportation, Fisheries and Aquatic Ecosystems, Vegetation and Wildlife, Agricultural Land and Water Use, Recreation Resources, and Visual Resources. The description of the environmental consequences and mitigation measures in Section VI, Sections 5.7, 6.1, 6.2, 7.1, 7.7, and 7.13 of these findings are hereby incorporated by reference as descriptive of the Program's contribution to cumulative impacts and adopted as mitigation measures for the Program's contributions to cumulative impacts. Although these mitigation measures will substantially reduce the environmental impacts in these resource areas, at this programmatic level of analysis, one or more impact in these resource areas remain significant even after adoption of all feasible mitigation measures. These are:

Section 5.7, Transportation

- Impact 3: Relocating or permanently closing roads.

Section 6.1, Fisheries and Aquatic Ecosystems

- Impact 1: Increased non-native species abundance and distribution to levels detrimental to native species from reestablishment of aquatic areas.

Section 6.2, Vegetation and Wildlife

- Impact 4: Temporary and permanent fragmentation of riparian habitats and/or wildlife movement corridors.
- Impact 6: Loss of portions of rare natural communities and significant natural areas.

Section 7.1, Agricultural Land and Water Use

- Impact 1: Conversion of prime, state-wide important, and unique farmlands to project uses.
- Impact 2: Conflicts with local government plans and policies.
- Impact 3: Conflicts with adjacent land uses.

Section 7.7, Recreation

- Impact 4: Temporary or permanent changes in boating access and navigation.

- Impact 8: Displacement of fish and wildlife and loss of terrestrial and loss of on-stream recreation from new off-stream or expanded on-stream reservoirs.

Section 7.13, Visual Resources

- Impact 1: Long-term visual impacts of new facilities or modified existing facilities.
- Impact 5: Long-term visual impacts from construction activities extending more than 5 years.

The Secretary finds that the specific economic, technological, environmental, social, and other considerations in support of the Program outweigh these significant adverse impacts for the reasons set forth in the Statement of Overriding Considerations.

VIII. GROWTH-INDUCING IMPACTS

The Preferred Program Alternative is expected to result in an improvement in water supply reliability for beneficial use in the Bay Region, Sacramento River Region, and San Joaquin River Region, and South-of-Delta SWP and CVP Service Areas. The Levee System Integrity Program actions will protect water supply reliability by maintaining levee and channel integrity, and levee actions will indirectly improve water supply reliability by designing actions to provide simultaneous improvement in habitat quality. Improvements in water quality will increase the utility of water, making it suitable for more uses and reuses. Improvements in water quality will also result in improved ecosystem health, with indirect improvements in water supply reliability. Any increase in water quality impacts, such as non-point source pollution associated with new growth, is anticipated to be offset by the substantial water quality improvements from the water quality and watershed management elements of the Program. Improvements in ecosystem health through the Ecosystem Restoration Program will reduce the conflict between environmental water use and other beneficial uses, and allow more flexibility in water management decisions. The Water Use Efficiency and Water Transfer Programs will increase water supply reliability by more efficient use and reuse of existing water supplies. Modifications in Delta conveyance will result in improved water supply reliability, protection and improvement of Delta water quality, improvements in ecosystem health, and reduced risk of supply disruption due to catastrophic breaching of Delta levees. Groundwater and surface water storage can be used to improve water supply reliability, provide water for the environment at times when it is needed most, provide flows timed to maintain water quality, and protect levees through coordinated operation with existing flood control reservoirs.

Consistent with the stated purposes of the CALFED Program since its outset in 1995, it is not the intent of this Program to address or solve all of the water supply problems in California. The CALFED Program is directly or indirectly tied to a number of specific project proposals that would help toward meeting California's water needs for a wide variety of beneficial uses. CALFED is an important piece of a much larger picture that is the continuing responsibility of local, regional, State and Federal jurisdictions.

There are differences of opinion as to whether improvements in water supply reliability would stimulate growth. The causal link between the CALFED Program and any increase in population or economic growth, or the construction of additional housing is speculative at this time. However, because this issue cannot be determined with certainty at this programmatic level of analysis, the assumption was made for this document that the improvement in water supply reliability that is associated with the Program could stimulate growth. This assumption assures that the EIS/EIR discloses the environmental consequences, at a programmatic level, associated with growth in the event that Program actions ultimately lead to this type of change.

At this programmatic level, it is unknown what level of growth or the likely location of any increases in population or construction of additional housing would take place. Increases in the population in the solution area are projected over the next 30 years, regardless of CALFED actions. When population growth occurs, it could lead to additional adverse impacts in certain locations, which local, regional, State, and Federal agencies will need to address when more information on those impacts and how to mitigate them is known. These impacts could include impacts on water quality and air quality, transportation, loss of open space, and other resource areas addressed in the EIS/EIR.

When additional growth occurs, these changes will be subject to local land use and regulatory decisions by individual cities and counties in the areas where they occur. Future development at the local level is guided by many considerations, only one of which is the reliability of water supply. These other factors include the policies in local general plans and zoning ordinance restrictions; the availability of a wide range of community services and infrastructure, such as sewage treatment facilities and transportation infrastructure; the availability of developable land; the types and availability of employment opportunities; and the analysis and conclusions based on an environmental review of proposed projects pursuant to CEQA. When additional population growth or new development occurs, and additional information is available, local, regional, State, and Federal governments will need to consider and address these potential adverse environmental impacts and methods to avoid or mitigate them.

IX. FEASIBILITY OF POTENTIAL PROJECT ALTERNATIVES

CEQA requires the lead agency, the Resources Agency, to consider a range of potentially feasible alternatives to the proposed Program. See Public Resources Code Sections 21002 and 21081; see also CEQA Guidelines Section 15126.6(f). "Feasible" means capable of being accomplished in a successful manner within a reasonable time, taking economic, environmental, legal, social and technological factors into account. CEQA Guidelines Section 15364. The range of alternatives to be considered is governed by a "'rule of reason' that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project." CEQA Guidelines Section 15126.6(f). Additionally, CEQA does not require the consideration of alternatives that are incompatible with the fundamental objectives of the Program or alternatives that would change the basic nature of the Program See *Save San Francisco Bay Ass'n v. San Francisco Bay Conserv. & Dev. Comm'n* (1992) 10 Cal.App. 4th 908, 919; *Marin Mun. Water Dist. v. KG Land Cal. Corp.* (1991) 235 Cal. App. 3d 1652.

A. Alternatives Considered and Not Taken Forward

1. Evaluation of Alternatives Against the Program Mission, Objectives and Solution Principles.

Purpose of the CALFED Program. In the past two decades, disagreements regarding the use and management of the Bay-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. Specifically, the mission of the CALFED 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. The CALFED Program evaluated a wide range of alternatives to determine the best way to fulfill this mission. 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.

2. Elimination of Alternative Configurations

Early in the Program, 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 Bay Delta Advisory Council, 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. In other words, each alternative is a combination of action categories reflecting differing approaches to achieving Program objectives and addressing solution principles.

As a way to manage the number of alternatives while still representing the full range of approaches to resolving problems, CALFED focused on the critical conflicts in the Bay-Delta system to help define an initial set of alternatives. These conflicts included the relationships between:

- Fisheries and diversions
- Habitat and land use and flood protection
- Water supply availability and beneficial uses
- Water quality and land use

Approximately 100 initial alternatives resulted from this focus. The initial alternatives varied in the level of effort applied to actions related to water use efficiency, water quality, ecosystem quality, and levee system integrity components.

Following evaluations and comments received at public meetings, workshops, and in writing, CALFED reached a number of conclusions regarding the makeup of each alternative:

The best possible source water quality is of paramount importance to urban water supplies. Agencies that deliver drinking water were 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 things of 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, facilities and property in the Delta. This argues for a similar level of Delta levee protection in each alternative.

Ecosystem actions in 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 a substantially increased level among all the alternatives. Water use efficiency will maximize use of existing supply to meet all needs and reduce the need for new storage.

The Program then refined the 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. Three basic alternative approaches developed in Phase I of the Program were carried into Phase II. Seventeen alternative configurations of the three basic alternative approaches were developed to further explore potential refinements for storage and conveyance in Phase II. Of the seventeen configurations, five were eliminated from further evaluation, and the environmental consequences of twelve of these were evaluated in the March 1998 Draft Programmatic EIS/EIR.

Based on public and agency comments on the March 1998 Draft Programmatic EIS/EIR and additional technical analysis, the Program was able to further refine and narrow the number of alternative solutions to the four evaluated in the July 2000 Final Programmatic EIS/EIR. Reasons for the elimination or consolidation of alternatives included technical deficiencies, creation of conditions damaging to the aquatic environment, higher costs relative to similarly performing alternatives, and the lack of a south Delta conveyance improvement element. The Program has determined that the Program objectives cannot be met without some south Delta conveyance improvements.

The four alternatives evaluated in the Final PEIS/EIR, Alternatives 1, 2 and 3 and the Preferred Program Alternative, vary primarily in their approach to water conveyance. 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 actions for water use efficiency, water quality, levee system integrity, ecosystem quality, water transfers, and watersheds. A range of storage options was evaluated for each alternative to support these programs and the Delta conveyance, and to seek a balance between attainment of Program objectives and cost effectiveness. For further discussion of these alternatives and the No Action Alternative and a comparison of each of the alternatives to the Preferred Program Alternative see section 2.1.4 below.

A detailed description of the program alternative selection process can be found in Section 1.4 and Response to Comment document of the EIS/EIR.

3. Elimination of Alternatives Recommended in Comments that Focus on One Primary Objective or Would Disregard or De-emphasize One or More Primary Objectives

A number of alternatives recommended in comment letters focus on one primary objective or would disregard or de-emphasize one or more primary objectives of the CALFED Program. Alternatives that would not achieve the primary interrelated objectives of the CALFED Program were not evaluated in detail, as they would not carry out the basic purpose of the Program.

Comment letter number 1199 raised an alternative that calls for substantially more ecosystem restoration and extensive land use changes than those in the CALFED Preferred Program Alternative. Other comments raised similar alternative scenarios. Each of these alternatives could result in significant redirected impacts to Delta agriculture and land use, would be substantially more expensive, and would suffer from lack of stakeholder support. Therefore, the Secretary finds that these alternatives are rejected as infeasible due to economic and social considerations and because they would not be consistent with the solution principles.

Comment letter numbers 1222, 1349, and others raised an alternative that de-emphasizes ecosystem restoration to avoid conversion of agriculture to natural habitats. Other comments raised similar alternative scenarios. In developing the ecosystem quality objective during the Phase I scoping process, following public comment, the CALFED Agencies determined that restoring ecological health to the Bay-Delta system cannot be accomplished without conversion of some agricultural land within the Bay-Delta to natural habitats. While the Program will focus on restoring habitat on public lands first and has committed to mitigation measures to avoid and minimize impacts of conversion, some conversion of agricultural land cannot be avoided. Therefore, the Secretary finds that these alternatives were not considered because they would not meet the ecosystem quality objective of the Program, one of the four primary objectives.

Comment letter numbers 1184, 1198, 1199, 1210, 1341, 1383, and others raised an alternative that relies solely on water use efficiency and conservation measures to avoid the construction of storage and conveyance facilities. Other comments raised similar alternative scenarios. Substantial and ambitious water use efficiency goals are incorporated in the CALFED Program. However, reliance solely on water use efficiency measures does not allow the flexibility of water management tools necessary to achieve the water supply, water quality, and ecosystem quality objectives of the Program. These alternatives, by themselves, could not sufficiently improve water management flexibility and therefore would fail to meet CALFED objectives for reducing conflicts in the Delta. Therefore, the

Secretary finds that these alternatives were not considered because they would not meet the Program primary objectives or achievethe goal of the Program.

B. Comparison of Alternatives

These findings compare all alternatives where appropriate in order to provide a basis for selection of the finally approved Preferred Program Alternative. In rejecting certain alternatives, the Secretary has examined the Program objectives and weighed the ability of the various alternatives to meet the objectives. Since all four alternatives carried forward for evaluation vary primarily in the method of conveyance, only the significant impacts associated with conveyance are compared in this finding.

While Alternatives 1, 2 and 3 evaluated in the June 1999 Draft Programmatic EIS/EIR would meet the Program's primary objectives to some extent, each alternative presents tradeoffs. The Preferred Program Alternative was crafted to strike a careful balance of benefits against the environmental impacts, uncertainty and other considerations of the three conveyance approaches. The Preferred Program Alternative accordingly includes elements from each of the three alternatives.

The discussion that follows compares the relative ability to reach Program objectives, environmental impacts, and feasibility of Alternatives 1, 2 and 3 and the No Action Alternative to the Preferred Program Alternative. The Preferred Program Alternative is described more fully in Chapter 2 of the EIS/EIR, Section II of these CEQA Findings of Fact, and in Subsection C. below.

1. Comparison to No Action Alternative

The No Action Alternative is a description of the anticipated physical, project operation, and regulatory environment that would be in place in 2020 if the Program is not approved and implemented. The purpose of this comparison is to highlight the changes to the environment that would take place as a result of implementing various alternatives.

Compared to the No Action Alternative and existing conditions, the Preferred Program Alternative provides significant improvements in terms of its ecosystem quality, water quality, water supply reliability, and levee system integrity effects. Under the No Action Alternative, each of these four areas of critical concern would continue to deteriorate. In addition, the quality of both in-Delta and export water likely would decline under the No Action Alternative. This decline in water quality would adversely affect irrigated agriculture, ecosystem health, fisheries, and drinking water quality. With the continued decline of the ecosystem, interruptions of water deliveries also likely would occur because of constraints on export pumping to protect threatened and endangered species. Finally, under the No

Action Alternative, the Delta levees would continue to be vulnerable to failure because of limited maintenance in some locations and the lack of a comprehensive plan for effective emergency response. The No Action Alternative fails to meet the Program objectives and would result in significant adverse impacts on the health of fisheries, endangered species, species of special concern and their habitat, water quality, and other Bay-Delta resources .

The Secretary has fully considered the No Action Alternative discussed in the EIS/EIR. The Secretary finds that the No Action Alternative fails to meet the Program objectives and would result in adverse consequences for water supply reliability, the health of fisheries, endangered species, species of special concern and their habitat, water quality, and other Bay-Delta resources.

For these reasons, the Secretary rejects the No Action Alternative.

2. Comparison to Alternative 1

Under Alternative 1, Delta channels would be maintained essentially in their existing configuration. Several improvements would be made in the south Delta similar to those in the Preferred Program Alternative. The Preferred Program Alternative includes these actions but also includes north Delta channel modifications for improved water conveyance and flood control and a contingent action, the diversion facility on the Sacramento River. However, if the diversion facility is not constructed, the Preferred Program Alternative would perform most similarly to Alternative 1.

Alternative 1, lacking north Delta channel improvements, would not provide as much flood control and water conveyance benefit in the Delta. Alternative 1 also does not have the potential for water quality improvement provided by the Preferred Program Alternative. The water quality improvement strategy for the Preferred Program Alternative is to aggressively implement the common programs and south Delta improvements in the first stage of implementation, as proposed for Alternative 1. Under the Preferred Program Alternative, however, if these actions do not achieve the water quality objectives, the diversion facility on the Sacramento River could be implemented, pending resolution of fisheries concerns and demonstrated benefits for water quality. This contingent action would improve Delta outflow under the Preferred Program Alternative, and decrease salinity and bromide for in-Delta and export water quality over Alternative 1.

Alternative 1 would create slightly fewer construction- and facility-related impacts on visual resources, cultural resources, geology and soils, transportation, and air quality compared to the Preferred Program Alternative. Since Alternative 1 does not include the option for diversion facility on the Sacramento River, Alternative 1 would avoid the potential for associated impacts on fish populations. However, the diversion facility would only be constructed and operated if adverse

impacts on fish populations could be avoided. Consequently, the Preferred Program Alternative will not have greater adverse impacts on fish populations than Alternative 1.

Alternative 1 provides less operational flexibility than the Preferred Program Alternative and accordingly could create fewer benefits to water supply reliability and water quality. Alternative 1 is therefore less effective in meeting CALFED's primary objectives.

The Secretary has fully considered Alternative 1 discussed in the EIS/EIR. The Secretary finds that while Alternative 1 would meet the Program's goals and primary objectives to some extent, the water quality objective may not be achievable through Alternative 1. Alternative 1 provides less operational flexibility and is less effective in meeting the Program objectives for water quality and water supply reliability and in providing flood control as compared to the Preferred Program Alternative.

3. Comparison to Alternative 2

Alternative 2 would employ a modified through-Delta conveyance approach. Significant improvements to north Delta channels, including construction of setback levees and channel dredging, and construction of a 10,000 cfs diversion from the Sacramento River to the Mokelumne River and associated fish protection facilities, would accompany the south Delta improvements contemplated under Alternative 1 and the Preferred Program Alternative.

The diversion would send greater volume and better quality water from the Sacramento River into the north Delta and east Delta . The diverted water would improve net-Delta outflow which helps to isolate the south Delta pumps from salinity intrusion and reduces the entrainment of San Joaquin River fish. The quality of in-Delta and exported water quality and would improve as compared to the Preferred Program Alternative.

However, Alternative 2 could result in significant adverse impacts on fisheries from the 10,000 cfs diversion facility. Fish mortality would increase as a result of reduced flow on the Sacramento River downstream of the diversion and greater proportion of fish entering Georgianna Slough and the Mokelumne River. Fish mortality would also increase from entrainment at the diversion. There is substantial uncertainty whether a facility as large as 10,000 cfs could be operated and screened sufficiently to avoid or minimize significant adverse effects on fish populations.

While the Preferred Program Alternative incorporates many of the benefits of Alternative 2 derived from north Delta channel modifications, there is uncertainty and concern that objectives for export and in-Delta water quality can be achieved with the common program elements and these actions. If water quality objectives not be met, the Preferred Program Alternative includes a diversion facility on the Sacramento River as a contingent measure to improve export water quality. The facility

would have a capacity no greater than 4000 cfs which would substantially reduce impacts on fisheries, and would provide similar, but less pronounced, water quality improvement as Alternative 2. The diversion facility would only be constructed if it is determined that significant adverse impacts on fish populations can be avoided. Alternative 2 does not include this option. While Alternative 2 could meet the Program's goals and primary objectives to some extent, the water quality benefits of Alternative 2 are outweighed by greater technological uncertainty and adverse impacts on fisheries as compared to the Preferred Program Alternative. Accordingly, Alternative 2 is less effective in meeting the Program objectives.

The Secretary has fully considered Alternative 2 discussed in the EIS/EIR. The Secretary for Resources finds that while Alternative 2 would substantially meet the Program's goals and primary objectives, the ecosystem quality objective may not be achievable through Alternative 2. The greater technological uncertainty and adverse impacts on fisheries outweigh the water quality benefits of Alternative 2 as compared to the Preferred Program Alternative. Accordingly, Alternative 2 is less effective in meeting the Program objectives.

4. Comparison to Alternative 3

Alternative 3 would employ a dual-conveyance approach employing a combination of through-Delta improvements similar to the Preferred Program Alternative and an isolated diversion facility on the Sacramento River to take water by canal to the export facilities in the south Delta.

Initially, the dual-Delta conveyance approach with an isolated facility appeared to provide greater technical performance than the other alternatives. Some of the preliminary scientific and engineering evidence suggests that a dual-Delta conveyance configuration may improve export water quality and achieve fish recovery most effectively. Relative to the Preferred Program Alternative, Alternative 3 would improve export water quality and improve Delta flow patterns for fish migration, including reduced incidence of reverse flow and entrainment in the south Delta pumps.

However, other evidence indicates that such a conveyance configuration can cause significant in-Delta water quality problems. The diversion would substantially reduce the flow of the Sacramento River below the diversion and could aversely affect fish migration and survival. The isolated facility would have a capacity between 5,000 cfs and 10,000 cfs. Higher capacity diversion would pose problems similar to Alternative 2. Additionally, construction-related impacts, land conversion and impacts from operation of the isolated facility, such as seepage, would be substantially greater under the Preferred Program Alternative.

In addition, during scoping and public meetings, many stakeholders and agencies voiced numerous concerns, including the difficulty of in ensuring the appropriate operation of such a facility,

fear that an isolated facility will decrease the incentive to manage the Delta as a "common pool" in which export water supply is coupled with the preservation of the Delta, that decreased dependence on a on a through-Delta approach could undermine the commitment for balanced solutions involving maintaining Delta levees, improving in-Delta quality and pursuing ecosystem restoration.

For these reasons, Alternative 3 presents the most serious challenges in terms of cost, scientific uncertainty, assurances and implementation. While Alternative 3 may technically perform better for certain resource areas than the Preferred Program Alternative, it is not clear that the additional cost and risk associated with the isolated facility would be worth the benefits. Years of scientific evaluation would be necessary to determine whether an isolated facility would be needed to meet water quality, water supply reliability and fisheries objectives. At the earliest, evaluation, design and permitting the facility would take ten years. Lastly, the isolated facility is so contentious that stakeholder support for the Program would be significantly eroded. Such lack of support could threaten the viability of the entire Program.

The Preferred Program Alternative has a high likelihood of success in a shorter time period. The Preferred Program Alternative also has lower risk, is less controversial, and would require less modification of the environment than Alternative 3. Should the Preferred Program Alternative not achieve a primary objective of the Program in the future, the Program includes a process for determining the conditions under which any future additional conveyance facilities or water management actions would be taken.

The Secretary has fully considered Alternative 3 discussed in the EIS/EIR. The Secretary rejects Alternative 3 as infeasible at this time due to social and technical considerations, based in large part due to the contentiousness and length of time associated with an isolated facility and the uncertainty that it will achieve the Program objectives any better than the Preferred Program Alternative.

5. Conclusion

For the foregoing reasons, the Secretary finds that Alternatives 3 is rejected as infeasible at this time. The Secretary finds that the Preferred Program Alternative is more effective in meeting the Program goals and objectives in the time frame needed for a viable solution and would result in fewer adverse impacts than Alternatives 1 and 2 as well as the No Action Alternative.

C. Benefits of the Preferred Program Alternative

The problems and potential solutions facing the Bay-Delta involve a complex set of interrelated biological, chemical, and physical systems. This complexity, coupled with the broad scope and number

of actions needed to implement the Program, the 30-year or more implementation period, the need to test hypotheses, and resource limitations make it necessary to implement the Program in stages. Consequently, the Preferred Program Alternative provides for implementation of the Program in a staged manner and establishes mechanisms to obtain the necessary additional information to guide the next stage of decision making.

The Preferred Program Alternative consists of a through-Delta conveyance approach, coupled with ecosystem restoration, water quality improvements, levee system improvements, increased water use efficiency, improved water transfer opportunities, watershed restoration, and additional surface waters and groundwater storage. The Preferred Program Alternative meets the Program's multiple purposes, reduces adverse environmental effects, and provides a system of research and monitoring to determine whether modifications or additional actions are needed. The Preferred Program Alternative provides multiple benefits, including:

- Modifying the timing and magnitude of flow to restore ecological processes and to improve conditions for fish, wildlife, and plants in the Bay-Delta system.
- Improving and increasing aquatic and terrestrial habitats.
- Modifying and eliminating fish passage barriers.
- Constructing fish screens that use the best available technology.
- Reducing the loads and impacts of bromide, total organic carbon, pathogens, nutrients, salinity, and turbidity.
- Reducing the impacts of pesticides.
- Reducing the impacts of trace metals, mercury, and selenium.
- Improving and maintaining the stability of the Delta and Suisun Marsh levee system.
- Enhancing flood protection for key Delta islands.
- Expanding and implementing agricultural and urban conservation incentive programs.
- Implementing better water management for managed wetlands.
- Facilitating water transfers while protecting from third parties from potentially significant adverse impacts.
- Supporting local watershed restoration, maintenance, and conservation activities.
- Developing appropriate groundwater and surface storage in conjunction with specified water conservation, recycling, and water transfer programs to provide water for the environment at times when it is needed most, and to improve water supply reliability.
- Modifying existing Delta conveyance systems for improved water supply reliability and water quality, improved ecosystem health, and reduced risk of supply disruption due to catastrophic breaching of Delta levees.

The Preferred Program Alternative is the most flexible and strategic approach to addressing Bay-Delta problems in that it incorporates the most effective and implementable components of Alternatives 1, 2 and 3. Elements that are undesirable for technological, environmental, economic or

social considerations have been excluded. The Program also minimizes irretrievable commitments of resources; certain facilities and operational changes will only be pursued if less expensive and lower conflict approaches fail to achieve the objectives. For instance, if water quality objectives are not met in the first seven years of implementation, the Preferred Program Alternative includes the option to construct a smaller version of the diversion facility on the Sacramento River described in Alternative 2. This facility would improve in-Delta and export water quality and Delta hydrodynamics compared to Alternative 1 and would be similar to the improvements from Alternative 2 while substantially reducing the fisheries impacts of Alternative 2. While Alternative 3 has the potential to perform technically better for water quality and fisheries, implementation of the isolated facility is currently infeasible and will not be carried forward in the Preferred Program Alternative.

If the Program purposes cannot be fully achieved with the actions proposed in the Preferred Program Alternative, additional actions—including an isolated conveyance facility—may need to be added in the future. Until additional information is available to determine whether water quality objectives and fish recovery goals can be met and which, if any, additional actions will be necessary to achieve the Program goals and objectives, the Preferred Program Alternative is the best alternative to achieve overall project purposes and provide significant beneficial improvements over the conditions anticipated under the No Action Alternative, while establishing a process for obtaining this additional information. Moreover, the way the alternatives are structured, going forward with the Preferred Program Alternative does not preclude the Program's ability to undertake additional conveyance actions, or other methods to achieve the primary objectives, in the future, subject to appropriate environmental review.

As described above, the Preferred Program Alternative adopts a set of programmatic actions designed to achieve the objectives for each of the resource areas while evaluating the effectiveness of those actions, and assessing whether modifications may be needed to meet Program goals and objectives. The Preferred Program Alternative is most effective in meeting Program goals and objectives and managing risk in a manner that has fewer adverse impacts than the other feasible alternatives.

The Secretary has adopted mitigation measures to avoid or minimize adverse environmental impacts described in Section VI of these Findings of Fact with respect to CEQA Guidelines Section 15091. The Secretary finds that all feasible mitigation measures are included in the Preferred Program Alternative and that it best meets the Program's multi-purpose objectives with the least environmental impact within a reasonable and feasible time frame. However, the Secretary finds that the Preferred Program Alternative could still result in significant and unavoidable impacts and accordingly a Statement of Overriding Considerations has been prepared.

STATEMENT OF OVERRIDING CONSIDERATIONS

A. General Findings

In approving the Preferred Program Alternative analyzed in the Final Programmatic EIS/EIR, the Secretary for Resources has adopted all feasible mitigation measures to avoid or reduce adverse environmental impacts as the Program is implemented. Although the Secretary for Resources believes that all of the unavoidable impacts will be substantially lessened by the mitigation measures incorporated into the Preferred Program Alternative, based on the programmatic level of analysis and existing information, it is not certain that all of these impacts can be avoided or reduced to a less than significant level. Therefore, for purposes of this programmatic document, these impacts are considered unavoidable.

The EIS/EIR and Section VI of the CEQA Findings of Fact identified the following unavoidable impacts:

Section 5.7, Transportation

- Impact 3: Relocating or permanently closing roads.

Section 6.1, Fisheries and Aquatic Ecosystems

- Impact 1: Increased non-native species abundance and distribution to levels detrimental to native species from reestablishment of aquatic areas.

Section 6.2, Vegetation and Wildlife

- Impact 4: Temporary and permanent fragmentation of riparian habitats and/or wildlife movement corridors.
- Impact 6: Loss of portions of rare natural communities and significant natural areas.

Section 7.1, Agricultural Land and Water Use

- Impact 1: Conversion of prime, state-wide important, and unique farmlands to project uses.
- Impact 2: Conflicts with local government plans and policies.
- Impact 3: Conflicts with adjacent land uses.

Section 7.7, Recreation

- Impact 4: Temporary or permanent changes in boating access and navigation.
- Impact 8: Displacement of fish and wildlife and loss of terrestrial and loss of on-stream recreation from new off-stream or expanded on-stream reservoirs.

Section 7.13, Visual Resources

- Impact 1: Long-term visual impacts of new facilities or modified existing facilities.
- Impact 5: Long-term visual impacts from construction activities extending more than 5 years.

The Secretary for Resources has carefully balanced the benefits of the Program. The Secretary for Resources finds that the Program achieves the four key objectives while at the same time balancing competing interests. In addition, the Secretary finds that the environmental, economic, legal, social, public health, planning, technological, and other benefits to be obtained by the Program outweigh the adverse environmental impacts of the Program.

In evaluating the CALFED Bay-Delta Program as a whole, the Secretary for Resources, acting pursuant to CEQA Guidelines Section 15093, finds that the remaining unavoidable and irreversible impacts of the Program are acceptable in light of the environmental, economic, legal, social, public health, planning, technological, and other considerations set forth herein because the benefits of the Program outweigh any significant and unavoidable or irreversible adverse environmental impacts. The Secretary for Resources accordingly makes this Statement of Overriding Considerations in support of these findings on the EIS/EIR. Moreover, the Secretary for Resources finds that where more than one reason exists for any finding, each reason independently supports these findings. The specific considerations which support approval of the Preferred Program Alternative are as follows.

B. Overriding Considerations

1. Need for A Solution for Problems in the Bay-Delta System

Even though environmental, urban, and agricultural interests agree on the importance of the Bay-Delta estuary for both fish and wildlife habitat and as a reliable source of water, few agree on how to manage and protect this valuable resource. In the past two decades, these disagreements have increasingly taken the form of protracted litigation and legislative battles; as a result, progress on virtually all water-related issues has become mired, approaching gridlock. Consequently, these "traditional" efforts to address the Bay-Delta problems have failed to reverse the steady decline of the Delta as fish and wildlife habitat and as a reliable source of water. It is in recognition of these failures that eighteen State and Federal agencies and numerous stakeholders have worked together over the last five years through the CALFED Program to develop a comprehensive plan to reduce these conflicts. Many people believe that CALFED represents the only viable possibility in the foreseeable future to create a lasting and comprehensive solution to Bay-Delta conflicts.

2. Benefits of a Comprehensive and Balanced Approach

CALFED's Preferred Program Alternative provides a unique opportunity to reduce conflicts and reverse the decline of Bay-Delta resources as compared to the No Action Alternative and all alternatives evaluated in the EIS/EIR. Through an investment in the Preferred Program Alternative's comprehensive and strategic efforts, the Program will realize substantial economic benefits, improved water supply reliability, ecological revitalization, improved fisheries populations, substantial water quality benefits, improved public health and safety, protection of property from flooding, achievement toward multiple societal goals, and other benefits.

The Program addresses problems in an integrated fashion. Program elements build upon one another to take advantage of opportunities to leverage funding, multi-benefit actions, and common stakes among different interest groups. Most actions that are taken to meet program objectives, if carefully developed and implemented, will make simultaneous improvements in two, three, or even four problem areas. A comprehensive CALFED solution will also be supported by governance and finance mechanisms that overcome problem-specific or resource-specific limitations of previous, more narrowly focused, approaches.

3. Specific Benefits from the CALFED Program

It is not surprising given the unprecedented geographic and temporal scope of this Program that significant, unavoidable impacts could occur even with the adoption of all feasible mitigation measures. The CALFED solution, described as the largest and most comprehensive program of its type in the world, is an effort of 30 or more years with actions targeting numerous resources across much of the State. Many of the unavoidable adverse environmental impacts of the Program would result from construction and operation of water storage and conveyance facilities. These unavoidable impacts, such as long-term visual impacts, road closure or relocation, and fragmentation of riparian corridors, tend to be localized to the area of the new facilities, and many of the impacts may be successfully avoided or minimized at some, but not all, potential locations. The balancing of the benefits and adverse impacts at any particular site need to be weighed when the project-specific environmental review for that project is considered. Most of the remaining significant unavoidable impacts would result from implementation of the Ecosystem Restoration Program. Although mitigation measures can substantially lessen the Ecosystem Restoration Program impacts on agricultural land, they are an inevitable consequence of achieving one of the essential objectives of the Program; ecosystem restoration in the Delta cannot be achieved without returning some agricultural lands within the Bay-Delta back to their natural state. Additionally, while restoration of habitat may increase the abundance of certain non-native species, information gained from the Program's adaptive management approach and the comprehensive non-native species research and control program will be used to minimize adverse impacts of non-native species.

As compared to the widespread benefits provided by the Program, the majority of these impacts tend to be minimal and localized. The Preferred Program Alternative provides significant improvements in terms of its ecosystem quality, water quality, water supply reliability, and levee system integrity effects compared to the No Action Alternative and existing conditions. Under the No Action Alternative, each of these four areas of critical concern would continue to deteriorate. Due to increasing water demands, there may be increasing pressure to divert more water from the system. At the same time, there will not likely be significant, positive action taken to improve ecosystem quality, with resultant adverse consequences for fisheries, other endangered species and species of concern, and their habitats. In addition, the quality of both in-Delta and export water likely could decline under the No Action Alternative. This decline in water quality would adversely affect irrigated agriculture, ecosystem health, fisheries, and drinking water quality. With the continued decline of the ecosystem, interruptions of water deliveries also likely would occur because of constraints on export pumping to protect threatened and endangered species. Finally, under the No Action Alternative, the Delta levees would continue to be vulnerable to failure because of limited maintenance in some locations and the lack of a comprehensive plan for effective emergency response.

Benefits to the Environment. Substantial environmental benefits would result from implementation of the Preferred Program Alternative. Although some Program elements could result in the loss or degradation of certain natural communities and wildlife habitat, these impacts tend to be minimal and localized relative to the significant, system-wide improvement in ecological health. The Secretary for Resources has balanced these considerations against the unavoidable environmental impacts identified in the EIS/EIR and has concluded that those impacts are outweighed by these environmental, economic, social, and other benefits.

The Ecosystem Restoration Program represents one of the most ambitious and comprehensive restoration projects ever undertaken in the United States. The Program addresses a wide range of aquatic, riparian, and upland habitats throughout the Bay-Delta ecosystem and numerous aquatic and terrestrial species that rely upon the Bay-Delta ecosystem for part or all of their life cycle. The ecosystem restoration element of CALFED is not only unprecedented in its scope but also its ecosystem-based, adaptive management approach described in the Strategic Plan for Ecosystem Restoration. Implementation of the Ecosystem Restoration Program will be guided by adaptive management principles. Under adaptive management, restoration actions are treated as "experiments" designed to test hypotheses about ecosystem function and to permit resource managers to learn from mistakes and adjust future actions accordingly. Additionally, the Program's strong commitment to scientific research and monitoring will better inform the design and implementation of actions, ensuring that ecosystem restoration addresses the highest priority concerns in the most efficient manner.

The fundamental approach of the Program, ecosystem-based management, is to restore or mimic natural ecological processes, such as improving streamflow variability and magnitude, reactivating sediment transport and channel-forming process, and setting back levees to open a portion of the

rivers' historic floodplains. By restoring ecological processes, the ecosystem will be able to create and maintain aquatic and terrestrial habitats and other, more subtle features of the natural system in order to support stable, self-sustaining populations of diverse and valuable species.

The Ecosystem Restoration Program was designed to achieve multiple goals and objectives. An ultimate goal is to recover the fish species listed under the Endangered Species Act that have forced cutbacks in water exports from the Bay-Delta. However, the Ecosystem Restoration Program goals include restoration of natural ecological processes, enhancing species populations for commercial and recreational harvest, restoration of habitat for public values like scientific research and aesthetics, controlling non-native species, and improving water quality.

As an integrated Program, each of the seven other Program elements contribute significantly to meeting CALFED's mission of restoring ecological health. Water quality improvement actions will address high-priority issues such as high salinity levels, low dissolved oxygen, and acid mine drainage. These measures will improve the suitability of Bay-Delta waters for sustaining aquatic organisms as well as for other beneficial uses of water, such as drinking water and irrigation. The suite of water management tools of the Program will also reduce the strain placed on the Bay-Delta ecosystem by ensuring that water management is done in the least environmentally harmful manner or even contributes to reaching an ecosystem objective, such as timing the releases of water from reservoirs to meet critical species needs. Additionally, new or expanded water storage can capture water during times of abundance and low fisheries impacts. This banked water can later be used during dry periods, either by releasing it to provide downstream water quality and habitat improvement or used in lieu of water pumping, thereby reducing conflicts with fisheries and other aquatic organisms.

Finally, the Environmental Water Account (EWA) is a cooperative management program whose purpose is to provide protection to the fish of the Bay-Delta estuary through environmentally beneficial changes in the Delta operations of the State Water Project and Federal Central Valley Project at no uncompensated water cost to the projects' water users. This approach to fish protection requires the acquisition of alternative sources of project water supply, called "EWA Assets," which will be used to augment stream flows, Delta outflows, to modify exports to provide fishery benefits and to replace the regular project water supply interrupted by the changes to project operations.

Benefits to Agriculture. Substantial water quality, water supply reliability, levee system integrity and other benefits to agriculture would result from implementation of the Preferred Program Alternative. The Secretary for Resources has balanced these considerations against the unavoidable environmental impacts identified in the EIS/EIR and has concluded that those impacts are outweighed by these economic, social, environmental, and other benefits.

The agricultural community and economy has changed significantly in California over the last few decades as a result of encroaching urbanization, protracted drought, listing of endangered species, political shifts, and other issues. Under No Action, urbanization will continue to convert agricultural

land to incompatible, non-agricultural uses. Although the CALFED Program itself would convert some agricultural land to meet the Program objectives, the Program offers many discernable benefits to agriculture through efforts that will improve water quality and increase water supply and reliability for irrigation, facilitate water transfers, protect Delta lands from floods, and strengthen the agricultural economy.

Specifically, ecosystem restoration actions will help to recover currently endangered and threatened species and maintain populations of non-listed species. Recovering listed species will ease current and prevent future regulatory restrictions on water diversions, thereby increasing the quantity and reliability of water available for irrigation. Rehabilitating Delta levees, a task too expensive for many individual farmers, will protect the long-term viability of Delta agriculture. Levee improvements will also reduce the risk of levee failure and corresponding saltwater intrusion. Delta levee rehabilitation, therefore, in conjunction with new or modified water storage and conveyance facilities would improve the quantity and quality of water taken from the Delta. The suite of water management tools will also improve the reliability of water supply, both in terms of its quality and quantity. Reducing uncertainty of water supply and quality will enable farmers and irrigation districts to plan for the future and invest their resources strategically. The EWA will help reduce conflicts between fish and Delta operations, therefore benefitting farmers dependent upon Delta exports.

While conversion of agricultural lands to urbanization due to developmental approvals by cities and counties will continue in the future, farmlands contracted under conservation easements will be productive, permanent components of the agricultural community, protected against development. The Ecosystem Restoration Program will encourage compatible agricultural uses by providing funding for wildlife-friendly agricultural practices on important lands used by wildlife for habitat. Moreover, measures such as buffers between properties and permitting certain agricultural practices on restored floodplains will ensure that ecosystem restoration projects are compatible with adjacent agricultural uses.

Because private lands will be acquired for habitat restoration on a willing seller basis only the agricultural community may benefit from economic efficiencies. Results of early restoration actions under the Category III restoration program show that agricultural lands which are marginal economically, especially flood-prone lands, have been acquired. The capital earned from land sales and reduced costs of managing marginal lands can be reinvested into the local economy through purchase of supplies and equipment including water use efficiency technologies.

Overall, the agricultural economy will be strengthened and more flexible. Water transfers, water use efficiency measures, and improvements in water supply reliability will provide much needed capital and economic efficiency to keep agriculture robust and sound.

Benefits to Urban Water Users. Substantial benefits to urban water users and municipalities would result from implementation of the Preferred Program Alternative. The Secretary for Resources has balanced these considerations against the unavoidable environmental impacts identified in the EIS/EIR and has concluded that those impacts are outweighed by these social, public health, economic, and other benefits.

One of the greatest problems facing urban water users is the unpredictability of the quality and quantity of their drinking water supplies. Annual variations in the availability of high quality water and the need for increasingly expensive treatment processes have made short- and long-term planning difficult. Urban water users and municipalities would benefit substantially from the Program's water quality and water supply reliability actions. The Program's water quality improvement strategy relies primarily on addressing constituents of concern at their source, thereby reducing the costs of treatment for municipalities. Public health will also be improved for the approximately 22 million Californians that use drinking water from the Bay-Delta.

Ecosystem restoration actions will help to recover endangered and threatened species, thereby easing current and preventing future regulatory restrictions on water diversions. The suite of water management tools will also improve the reliability of water supply, both in terms of its quality and quantity. Reducing uncertainty of water supply and quality will enable municipalities to plan for the future and invest their resources strategically. The EWA will help reduce conflicts between fish and Delta operations, therefore benefitting urban water users dependent upon Delta exports.

Economic Benefits. Substantial economic benefits would result from implementation of the Preferred Program Alternative. The Secretary for Resources has balanced these economic considerations against the unavoidable environmental impacts identified in the EIS/EIR and has concluded that those impacts are outweighed by the economic, social and other benefits.

In addition to the economic benefits described above for agriculture and urban water users, there are additional statewide economic benefits. The Program addresses the underlying causes of Bay-Delta problems, rather than the symptoms, in a holistic and multi-faceted approach. Thus, the Program's investment in restoring and managing the Bay-Delta will pay substantial dividends for taxpayers as well as urban and agricultural water users. By rehabilitating Delta levees, property and personal safety will be protected on Delta islands, and the additional costs to taxpayers from catastrophic flood will be reduced. Healthy ecosystem function provides additional benefits such as increased catches for commercial fisheries and economic and legal benefits associated with reduction of regulatory constraints on water diversions.

Social Benefits. Substantial evidence is included in the record of these proceedings demonstrating the social benefits and furtherance of social goals that would result from implementation

of the Preferred Program Alternative. The Secretary for Resources has balanced these social considerations against the unavoidable environmental impacts identified in the EIS/EIR and has concluded that those impacts are outweighed by these social and other benefits.

Compared to the widespread benefits provided by the Program, the adverse impacts from new or expanded reservoirs and conveyance facilities on visual resources, recreation, and transportation tend to be minimal and localized to the area of the new facilities. Although new or expanded surface water reservoirs could impact some existing forms of recreation, the reservoirs themselves and the Program as a whole will result in a substantial enhancement of recreation opportunities, including fishing, hunting, wildlife viewing, boating, and hiking. New facilities would result in permanent visual impacts. These impacts, however, are outweighed by visual improvement provided by habitat restoration.

A restored ecosystem will not only benefit species of concern, but will also help achieve societal goals. Restored habitats will provide for human uses and appreciation, such as enhanced recreation, aesthetics, scientific study, and other non-consumptive uses.

The Program represents a cost-effective and socially-optimal allocation of resources by reducing conflicts over Bay-Delta resources. Society as a whole will benefit from taking positive, affirmative measures to address these conflicts facing the entire State, rather than allowing the parties to return to entrenched litigation or inaction.

C. Conclusion

The Secretary for Resources believes that the important environmental, economic, legal and social benefits described above will be derived from implementation of the Program. These benefits, when weighed against the adverse impacts resulting from taking no action and as compared to the existing environment, override the significant unavoidable adverse impacts of the Program.

The Secretary for Resources has balanced these considerations against the various unavoidable environmental impacts of the Program and concludes that the benefits which will be derived from the implementation of the Program outweigh those impacts.

The Secretary for Resources therefore finds that these impacts are acceptable due to the overriding concerns described above and all of the environmental trade-offs involved in this course of action. The Secretary for Resources concludes that the proposed Preferred Program Alternative, with the mitigation measures and strategies adopted in Part VI of these CEQA Findings, should be approved.

CERTIFICATION OF THE SECRETARY
CALIFORNIA RESOURCES AGENCY

I, Mary D. Nichols, Secretary, California Resources Agency, approve the Preferred Program Alternative as described in the Final Programmatic EIS/EIR for the CALFED Bay-Delta Program, dated July 2000, and hereby certify the following:

1. The Final Programmatic EIS/EIR has been completed in compliance with the California Environmental Quality Act.

2. The Final Programmatic EIS/EIR reflects the Resources Agency's independent judgment and analysis.

3. I reviewed and considered the information in the Final Programmatic EIS/EIR before approving the Preferred Program Alternative for the CALFED Bay-Delta Program.

August 28, 2000
Date

Mary D. Nichols, Secretary
California Resources Agency

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