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Programmatic Record of Decision, Volume 3 - Attachments 7 through 10

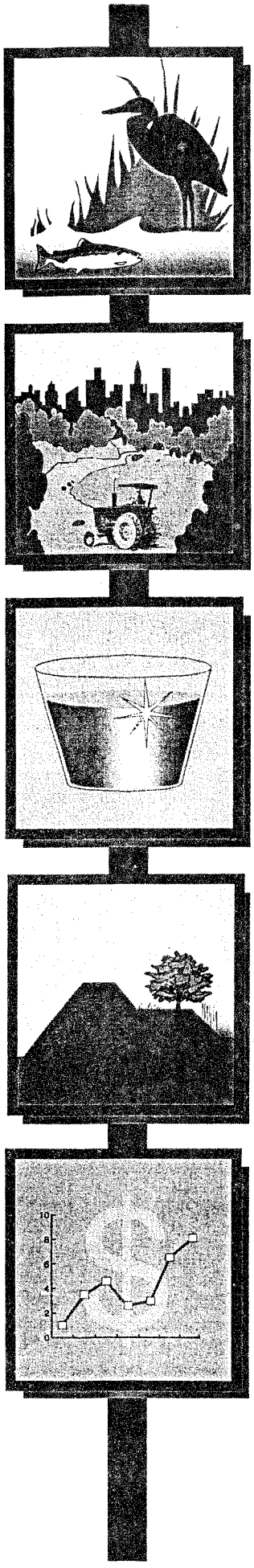
CalFed Bay-Delta Program

CALFED
BAY-DELTA
PROGRAM

Programmatic Record of Decision

Volume 3- Attachments 7 through 10

August 28, 2000



CALFED
BAY-DELTA
PROGRAM

Attachment 7
Natural Community Conservation Plan Determination

August 28, 2000

Natural Community Conservation Plan Approval

California Department of Fish and Game
Approval and Supporting Findings
for the
CALFED Bay Delta Program
Multiple Species Conservation Strategy

I. Introduction

A. The Natural Community Conservation Planning Act

The **Natural Community Conservation Planning Act** (NCCPA), California Fish & Game Code §2800, et seq.,[1] authorizes the preparation and implementation of large-scale natural resource conservation plans. A **natural communities conservation plan**, or NCCP, must identify and provide for "the regional or area wide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth." (§2805(a).) NCCPs are intended "to provide comprehensive management and conservation of multiple wildlife species" including, but not limited to, species listed pursuant to the **California Endangered Species Act**, §2050, et seq. (§2810.) (CESA).

The NCCPA promotes cooperation and coordination among public agencies, landowners, and other private interests in developing NCCPs. The **California Department of Fish and Game** (DFG) is authorized to prepare and implement NCCPs with a wide variety of private and public interests, including individuals, organizations, companies, and State and local government agencies. (§2810 and §711.2.) Natural community conservation planning may be undertaken by local, State, and Federal agencies independently or in cooperation with other individuals and entities (§2820.)

An NCCP must be approved by DFG before it is implemented (§2820.) To be approved, an NCCP must meet standards established by DFG. (§2820.) DFG is authorized to prepare non-regulatory guidelines to establish NCCP standards and to guide the development and implementation of NCCP Plans (§2825(a).) NCCPs are also subject to review under the California Environmental Quality Act, Public Resources Code §21000, et seq.

DFG may authorize the "taking" of any identified species, including endangered species and threatened species, whose conservation and management is provided for in a DFG approved NCCP Plan (§2835.) Under the Fish and Game Code, "Take" means "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." (§86.)

Because the NCCPA allows DFG to authorize incidental take of endangered species and threatened species, an NCCP may be used to comply with CESA.

B. The CALFED Bay-Delta Program

In 1994, the Governor's Water Policy Council of the State of California and the Federal Ecosystem Directorate entered into a Framework Agreement to establish a comprehensive program for coordination and communication with respect to environmental protection and water supply dependability in the San Francisco Bay/San Joaquin River Bay-Delta Estuary. This Framework Agreement served as the basis for the **CALFED Bay-Delta Program** (CALFED Program).

The CALFED Program is a cooperative effort of **eighteen State and Federal agencies with regulatory and management responsibilities in the Bay-Delta** (the "CALFED agencies") to develop a long-term plan to restore ecosystem health and improve water management for beneficial uses of the Bay-Delta system. The CALFED Program's objective is to identify comprehensive solutions to the problems of ecosystem quality, water supply reliability, water quality, and Delta levee and channel integrity.

The CALFED Program's mission 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 is also guided by solution principles adopted by CALFED agencies. According to these principles, a successful program solution must reduce conflicts in the system, be equitable, be affordable, be durable, be implementable, and have no significant redirected impacts.

The CALFED Program is described in greater detail below.

C. The Multi-Species Conservation Strategy

The **Multi-Species Conservation Strategy** (MSCS) has been submitted to DFG for approval as an NCCP for the CALFED Program. The MSCS is an approach that entities implementing CALFED actions may use to fulfill the requirements of the **Federal Endangered Species Act** (FESA), CESA, and the NCCPA.

Specifically, the MSCS:

- analyzes CALFED's effects on 244 "evaluated species" and 20 natural communities ("NCCP communities") — comprising 18 habitats and two ecologically based fish groups comprised of anadromous and estuarine fish species for FESA, CESA, and NCCPA purposes;

- identifies species goals ("recovery", "contribute to recovery", or "maintain") for each of the 244 evaluated species, as well as conservation measures to achieve the goals;

- identifies goals for each of the 20 NCCP communities, as well as conservation measures to achieve the goals; and

- provides for the preparation of **Action Specific Implementation Plans** (ASIPs), which will strengthen and simplify the CALFED Program's compliance with FESA, CESA, and NCCPA.

The MSCS contains two types of conservation measures:

- measures to avoid, minimize, and compensate for adverse effects to NCCP communities and evaluated species caused by individual program actions; and

- measures to enhance NCCP communities and evaluated species that are not directly linked to adverse effects from program actions.

The MSCS features a two-tiered approach to FESA, CESA, and NCCPA compliance that corresponds to CALFED's two-tiered approach to compliance with the **National Environmental Policy Act** (NEPA) and the **California Environmental Quality Act** (CEQA). The MSCS provides a program-level evaluation of the CALFED Program under FESA and NCCPA, just as the July 2000 **Final Programmatic Environmental Impact Statement/Environmental Impact Report for the CALFED Bay-Delta Program** (Final Programmatic EIS/EIR) provides a program-level evaluation under NEPA and CEQA. ASIPs are intended to complement the second-tier, project-level environmental review of program actions that is anticipated in the Final Programmatic EIS/EIR.

Because it is a comprehensive regulatory compliance strategy and is integrated with the Final Programmatic EIS/EIR, the MSCS helps assure that CALFED can complete actions in accordance with FESA, CESA, and NCCPA, and that the compliance process will be systematic, efficient, and predictable. Neither the MSCS, nor this NCCPA Program Approval, will give the CALFED Program general authority to take endangered or threatened species. However, the MSCS's compliance process enables program implementing entities to obtain authorizations under FESA and NCCPA that allow incidental take of Covered Species caused by specific program actions.

1. Conservation Goals approach

The MSCS assigns a goal to each MSCS evaluated species. The three alternative goals are recovery (R), contribute to recovery (r), and maintain (m).

- A goal of "recovery" was assigned to those species whose recovery is dependent on restoration of the Delta and Suisun Bay/Marsh ecosystems and for which the CALFED Program could reasonably be expected to undertake all or most of the actions necessary to recover the species. Recovery is achieved when the decline of a species is arrested or reversed, threats to the species are neutralized, and the species' long-term survival in nature is assured.

- The goal "contribute to recovery" was assigned to species for which program actions affect only a limited portion of the species' range and/or program actions have limited effects on the species. To achieve the goal of contributing to a species' recovery, the CALFED Program will undertake some of the actions under its control and within its scope that are necessary to recover the species. When a species has a recovery plan, the CALFED Program may implement both plan measures that are within the Problem Area and some measures that are outside the Problem Area. For species without a recovery plan, the CALFED Program will need to implement specific measure that will benefit the species.

- The goal "maintain" was assigned to species expected to be affected minimally by program actions. The MSCS requires that the CALFED Program avoid, minimize, and compensate for the adverse effects of its actions on species in this category. The avoidance, minimization, and compensation measures for these species may not contribute to their recovery, but will ensure that program actions will not degrade the species' status or contribute to the need to list the species. In addition, the CALFED Program is expected to take advantage of opportunities to improve conditions for these species where practicable.

The MSCS also describes goals for 20 NCCP communities, which include two fish groups. The goals for the two NCCP fish groups and most of the other 18 natural communities were developed within the **Ecosystem Restoration Program** (ERP) and the **Strategic Plan for Ecosystem Restoration** (Strategic Plan). Goals for NCCP communities not addressed by the ERP are predicated on the fisheries and aquatic ecosystems and vegetation and wildlife strategies in the Final Programmatic EIS/EIR.

2. Scope of the Multi-Species Conservation Strategy

The scope of the MSCS is defined by two factors:

- the geographic area encompassed by CALFED actions and;
- the habitats and species evaluated in the MSCS.

a) Geographic scope

As described in Chapter 1 of the Final Programmatic EIS/EIR, the geographic scope of the CALFED Program includes two distinct areas, the "**Problem Area**" and the "**Solution Area**". The Problem Area is defined as the legal Delta and Suisun Bay and Marsh. The Solution Area is much broader in extent than the Problem Area; it encompasses the Central Valley watershed, the upper Trinity River watershed, the southern California water system service area, San Pablo Bay, San Francisco Bay, portions of the Pacific Ocean out to the Farallon Islands, and a near-shore coastal zone that extends from about Morro Bay to the Oregon border.

The CALFED Program will affect a very large geographic area and the range of effects varies greatly. The MSCS addresses four distinct geographic subareas of the CALFED Program Problem and Solution Areas. These areas are the:

- **MSCS Focus Area.** This area includes the legally defined Delta, Suisun Bay and Marsh, the Sacramento and San Joaquin Rivers and their tributaries downstream of major dams, and the potential locations of reservoirs. This is the same as the focus study area of the ERP, with the addition of the potential reservoir sites under consideration as part of the CALFED Program.

- **Other Service Areas.** Other **State Water Project** (SWP) and **Central Valley Project** (CVP) service areas that are located outside of the MSCS Focus Area and the Watershed Program Area. Potential effects in these service areas cannot be determined until individual program actions or groups of actions are identified and defined.

- **Watershed Program Area.** This area encompasses the watersheds of the CALFED Program Solution Area, but the CALFED Program focuses on the watersheds of the San Joaquin and Sacramento Rivers, including those areas located above major dams and outside the Focus Area, and a portion of the upper Trinity River watershed. Restoration and management actions implemented through the Watershed Program can yield other benefits, such as water quality and other streamflow improvements and reductions in reservoir sedimentation. At this time, specific information is not available about possible CALFED Program Watershed actions and their potential effects on MSCS Evaluated Species (see explanation of Evaluated Species below).

- **Outer Bay Region.** This area encompasses near-shore coastal areas used by some of the evaluated species. This area is not analyzed in the MSCS because program actions do not extend into that area.

b) Evaluated Species and Covered Species

CALFED agencies have identified more than 400 species that use the Focus Area. This list was reduced to 244 Evaluated Species that either could be affected by program actions or are listed under FESA or CESA. The ERP describes targets and programmatic actions for many of the evaluated species. However, for purposes of FESA, CESA, and NCCPA compliance, USFWS, NMFS, and DFG, in consultation with CALFED, developed separate MSCS species goals that reflect applicable regulatory standards. The USFWS, NMFS and DFG also developed a list of MSCS "conservation measures." Most of the MSCS conservation measures were refinements of ERP actions that are now incorporated within the ERP. Some additional conservation measures were also incorporated within the ERP.

Based on the MSCS, the ERP, and other relevant parts of CALFED, DFG has identified a list of "Covered Species." DFG's list of Covered Species includes the Evaluated Species that DFG has determined will be adequately conserved by the MSCS in accordance with the NCCPA. Pursuant to the NCCPA, a species is adequately conserved by the MSCS if it includes conservation methods and procedures that are adequate to protect and perpetuate a the species within the Focus Area, taking into consideration the whole of the CALFED Program, including the direct and indirect effects of program actions.

Covered species include species for which take authorization could be issued for actions that follow the MSCS compliance process as described in Chapter 6 of the MSCS, as well as species for which take authorization cannot be issued. For example,

incidental take of extremely rare species will not be authorized. In addition, incidental take will not be authorized where prohibited by certain laws other than FESA or CESA, such as provisions of the California Fish and Game Code for "fully protected" species and "specified birds." (See, §3505, §3511, §4700, §5050, and §5515.)

3. Adaptive Management, Monitoring and Reporting

The CALFED Program addresses a broad range of species and habitat types throughout a large area, and encompass numerous large-scale, long-term actions. In preparing the MSCS and ERP, the CALFED Program has used the best available scientific information and collected input from a broad array of experts; however, it is likely that some proposed measures will fail to achieve their objectives. Other measures that achieve some success may, nonetheless, not provide the best solutions to the problems addressed.

The ROD establishes the CALFED Science Program, which will bring world-class science to all elements of the CALFED Program. The Science Program will be developed and directed by an interim lead scientist, who will also serve in the role of lead scientist during the initial years of CALFED Program implementation. Implementation of the Science Program includes implementation of the Comprehensive Monitoring, Assessment, and Research Program (CMARP), now under the direction of the interim lead scientist.

In recognition of the uncertainties inherent in any program of this magnitude, the CALFED Program includes provisions for applying an adaptive management process based on comprehensive monitoring and assessment of program implementation. This process ensures that the CALFED Program and the MSCS can be modified, as appropriate, to use consistently the best information regarding evaluated species and the most effective, practical means for achieving their goals. For the CALFED Program as a whole, the Science Program will help refine program actions based on monitoring results. The adaptive management components of the MSCS are described in Chapter 7 and Chapter 8 of the MSCS. These chapters describe how the CALFED Program will periodically evaluate the effectiveness of the conservation measures and modify these measures when necessary.

D. The Conservation Agreement

CALFED agencies that will approve, fund or implement program actions have entered into the "CALFED Bay-Delta Program Conservation Agreement regarding the Multi-Species Conservation Strategy" dated August 28, 2000 (the "Conservation Agreement"). The purpose of the Conservation Agreement is to define the CALFED agencies' commitments with respect to

the MSCS and the CALFED Program's compliance with FESA, CESA and the NCCPA. This NCCPA Program Approval is based in large part on the commitments of the CALFED agencies in the Conservation Agreement. The Conservation Agreement is incorporated herein by reference.

E. The Effect of this NCCPA Program Approval

This NCCPA Program Approval is DFG's determination that the MSCS satisfies the requirements of the NCCPA for a programmatic NCCP. DFG has determined that the MSCS identifies and provides for the regional or areawide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth. If implemented in accordance with the MSCS and the Conservation Agreement, the CALFED Program will achieve the goals of the MSCS and will comply with the NCCPA and CESA. This NCCPA Program Approval does not authorize incidental take of any species of fish, plant or wildlife, nor does it authorize any specific program action. Specific program actions have not been proposed or submitted to DFG for review under CESA or the NCCPA. However, once specific program actions have been developed, they may obtain incidental take authorization for Covered Species under a simplified regulatory compliance process established in the MSCS. In accordance with this process, DFG will evaluate each program action as a component of the MSCS, not as an isolated project, when determining whether the action complies with the NCCPA and CESA. If a proposed program action implements and adheres to the MSCS, it may be carried out in compliance with the NCCPA and CESA. Provided the CALFED Program continues to be implemented in accordance with the MSCS and the Conservation Agreement, program actions may use the MSCS to comply with the NCCPA and CESA.

F. Basis for NCCPA Program Approval

This NCCPA Program Approval is based on information, analyses, and conclusions contained in DFG files, and in the following documents

- MSCS, dated July 2000
- Conservation Agreement, dated August 28, 2000
- CALFED Bay-Delta Program Programmatic Record of Decision, dated August 28, 2000
- Final Programmatic EIS/EIR, dated July 2000
- Implementation Plan, dated July 2000
- Phase II Report, dated July 2000
- Ecosystem Restoration Program, Volume I and Volume II, dated July 2000
- Strategic Plan For Ecosystem Restoration, dated July 2000
- Ecosystem Restoration Program Maps, dated July 2000
- Levee System Integrity Program Plan, dated July 2000

- Water Quality Program Plan, dated July 2000
- Water Use Efficiency Program Plan, dated July 2000
- Water Transfer Program Plan, dated July 2000
- Watershed Program Plan, dated July 2000
- Comprehensive Monitoring, Assessment and Research Program Plan, dated July 2000
- Response to Comments, Vol. I, Impact Analysis, dated July 2000
- Response to Comments, Vol. II, Technical Appendices, dated July 2000
- Response To Comments, Vol.III, Comment Letters and Testimony, dated July 2000
- The National Marine Fisheries Service Biological Opinion for the Program, dated August, 2000
- The United States Fish & Wildlife Service Biological Opinion for the Program, dated August, 2000

II. The CALFED Bay-Delta Program

A. Description of the Proposed Action

The CALFED Program is a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The CALFED Program addresses issues in four general problem areas: ecosystem quality, water quality, water management, and levee system integrity. The following CALFED Program elements were developed to solve issues in the problem areas:

- Levee System Integrity Program
- Water Quality Program
- Ecosystem Restoration Program
- Water Use Efficiency Program
- Water Transfer Program
- Watershed Program
- Storage
- Conveyance
- Environmental Water Account
- Science Program
- Multi-Species Conservation Strategy
- Governance

Most CALFED Program elements are described in technical appendices to the Final Programmatic EIS/EIR. Storage and Conveyance are described separately. The EWA is an operational strategy intended to improve fish protection while not adversely affecting water supply.

All aspects of the CALFED Program are interrelated and interdependent. Ecosystem restoration is dependent upon supply and conservation. Supply is dependent upon water use efficiency and consistency in regulation. Water quality is dependent upon water use efficiency and consistency in regulations, improved conveyance, levee stability and healthy watersheds.

The CALFED Program includes a framework guiding implementation that addresses the scope, complexity, and duration of the CALFED Program, and the relative uncertainty regarding the CALFED Program's approach in resolving issues in the problem areas. Implementation is supported by an Implementation Plan that describes Stage 1 actions, CALFED Program integration, governance, and financing. In addition, a Science Program is included to carry out monitoring, assessment and research; and a MSCS will be followed to achieve compliance with the ESA. Implementation of the CALFED Program will be guided by an adaptive management approach with monitoring of performance to help modify (adapt) future actions and contribute to decision making. Also, the CALFED Program will be guided by the principle of balanced implementation of CALFED Program elements.

The term of this NCCPA Program Approval includes Phase III of the CALFED Program (30 years or more), provided the CALFED Program remains in compliance with this NCCPA Program Approval. DFG will evaluate the CALFED Program's consistency with this NCCPA Program Approval at numerous points in the future, including:

- During review of annual reports submitted by the CALFED Program.
- During subsequent, tiered informal and formal consultation on ASIPs.
- After 4 years of implementation when sufficient data is collected and analyzed to fully evaluate the effectiveness of the WMS, together with other conservation elements, in meeting the conservation objectives of the CALFED Program.
- At the conclusion of Stage 1 to assess the Program's compliance in achieving the conservation objectives established in the CALFED "Milestones."

If DFG determines that the CALFED Program is not in compliance with this NCCPA Program Approval, the CALFED Agencies will reinitiate this NCCPA Program Approval. In addition, refer to the suspension and withdrawal of NCCPA Program Approval statement for further reasons for reinitiation.

The following sections describe the CALFED Program and its elements in greater detail.

Levee System Integrity Program

The Levee System Integrity Program's goal is to improve levees and levee management in the legal Delta and will investigate the level of levee work in Suisun Marsh, which together define its

scope. All projects under the Levee System Integrity Program will be implemented to be fully consistent with other CALFED Program elements, including the ERP, Conveyance, and MSCS. Project-specific plans will incorporate appropriate elements of these other programs and strategies. Individual projects pursued under the Levee System Integrity Program, including each of the levee plans described below, will fully evaluate all alternatives during tiered environmental review and will fully analyze and address effects under NCCPA and/or CESA and section 7 or section 10 of the ESA. The Levee System Integrity Program is comprised of the following five elements in the Delta, and a plan for Suisun Marsh levees:

Delta Levee Base Level Protection Plan. The CALFED Program will provide funding to participating local agencies in the Delta to reconstruct certain Delta levees to a uniform, base-level standard. The tentative standard is the Public Law (PL) 84-99 Delta Specific Standard (PL 84-99). Constructing levees to the PL 84-99 criteria is a prerequisite for, but not a guarantee of, post-flood Federal disaster assistance. This plan will evaluate the estimated 520 miles of non-Federal levees in the Delta and recommend levee segments that should conform with the Delta Specific Standard criteria. In addition, a funding mechanism will be established to support the routine inspection and maintenance of levees in the Delta, and for emergency response.

Delta Levee Special Improvement Projects. These projects will target areas that will provide flood protection above base-level standards for some islands protecting public benefits such as water quality, the ecosystem, life and personal property, agricultural production, cultural resources, recreation, and local and Statewide infrastructure. The scope of the Delta Levee Special Improvement Projects encompasses the Delta and levees bordering the northern Suisun Bay from Van Sickle Island to Montezuma Slough. Maintenance of upgraded levees will occur in conformance with specific criteria, consistent with meeting ERP objectives.

Delta Levee Subsidence Control Plan. The goal of this plan is to minimize the risk to levee integrity from land subsidence, in coordination with other CALFED Program elements. Measures will be implemented to reduce, eliminate, or reverse subsidence within a "zone of influence" (approximately 0-500 ft) adjacent to affected levees. Subsidence control techniques include:

- Geotechnical engineering principles and practices in conjunction with proven construction methods.
- Modifying seepage control, dewatering efforts, excavations, and land management activities near levees to best manage levee integrity.
- Strategically locating and constructing stability and drainage berms.
- Restricting practices such as land leveling, ditching, and certain other ground surface modifications within the zone of influence.
- Promoting high ground water levels and vegetation growth, where appropriate, to limit subsidence due to oxidation.

Delta Levee Emergency Management and Response Plan. The goals of this plan are to enhance existing emergency management response capabilities in the Delta, and to develop a stable funding source for emergency response. Future planning will concentrate on improving funding, resources, and response by State and Federal agencies; integrating response by all levels of government; clarification of regulatory procedures; and improving dispute resolution procedures.

Delta Levee Risk Assessment and Risk Management Strategy. The goals of this strategy are to quantify the risks to Delta levees, evaluate the consequences, and develop an appropriate risk management strategy by the end of Stage 1.

Suisun Marsh Levee System Plan. The CALFED Program will evaluate whether to include the Suisun Marsh levee system in the Levee Integrity Plan, and, if included, what level of protection is appropriate. This plan will evaluate the appropriate level of protection for Suisun Marsh levees, evaluate the best method of protection, and implement the method during Stage 1. This plan may protect part of the levee system by rehabilitating and maintaining some levees to protect managed wetlands and develop new tidal wetlands. Implementation will incorporate ERP and MSCS actions, consistent with Service-approved recovery plans.

Proposed Levee System Integrity Program Stage 1 Actions

The CALFED Agencies will evaluate the following Levee System Integrity Program actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the Levee System Integrity Program.

- Initiate the Levee Program Coordination Group. Develop and implement an outreach, coordination, and partnering program with local landowners including individuals, cities, counties, reclamation districts, resource conservation districts, water authorities, irrigation districts, farm bureaus, other interest groups, and the general public to assure participation in planning, design, implementation, and management of levee projects (yr 1).
- Obtain short-term Federal and State funding authority as a bridge between the existing Delta Flood Protection Authority (AB 360) and long-term levee funding (yr 1-5).
- Obtain long-term Federal and State funding (yr 1-7).
- Conduct project level environmental documentation and obtain appropriate permits for each action/group of actions (yr 1-7).
- Implement demonstration projects for levee designs, construction techniques, sources of material, reuse of dredge material, and maintenance techniques that maximize ecosystem benefits while still protecting lands behind levees. Give priority to those levee projects which include both short (i.e., construction) and long-term (i.e., maintenance and design) ecosystem benefits, and provide increased information (yr 1-7).
- Adaptively coordinate Delta levee improvements with ecosystem improvements by

incorporating successful techniques for restoring, enhancing, or protecting ecosystem values developed by levee habitat demonstration projects or ecosystem restoration projects into levee projects. Continue to develop techniques as major levee projects are implemented (yr 1-7).

- Fund levee improvements up to PL 84-99 criteria in Stage 1; e.g., proportionally distribute available funds to entities making application for cost sharing of Delta levee improvements (yr 1-7).
- Further improve levees which have significant Statewide benefits in Stage 1; e.g., State-wide benefits to water quality and highways (yr 1-7).
- Coordinate Delta levee improvements with Stage 1 water conveyance, water quality improvements (yr 1-7).
- Enhance existing emergency response plans; e.g., establish a revolving fund, refine command and control protocol, stockpile flood fighting supplies, establish standardized contacts for flood fighting and recovery operations, and outline environmental considerations during emergencies (yr 1-7).
- Implement current Best Management Practices (BMPs) to correct subsidence effects on levees. Assist CALFED Program's Science Program activities to quantify the effect and extent of inner-island subsidence and its linkages to all CALFED Program objectives (yr 1-7).
- Develop BMPs for the reuse of dredge materials (yr 1).
- Institute a program for using Bay and Delta dredge material to repair Delta levees and restore Delta habitat (yr 1-7).
- Complete total risk assessment for Delta levees and develop and begin implementation of risk assessment options as appropriate to mitigate potential consequences (yr 1-7).
- Complete the evaluation of the best method for addressing the Suisun Marsh levee system (yr 1-2).

Water Quality Program

The CALFED Program's WQP will strive to create water quality conditions that fully support a healthy and diverse ecosystem and the multiplicity of human uses of water. The geographic scope of the WQP encompasses five regions: the legal Delta; the Bay Region which includes Suisun Bay and Marsh, San Pablo Bay, and the San Francisco Bay watershed; the Sacramento River Region, bounded by the ridge tops of the Sacramento River watershed or hydrologic region; the San Joaquin River Region which includes both the San Joaquin River and Tulare Lake hydrologic basins; and, SWP and CVP service areas outside the Central Valley.

The CALFED Program's Water Quality Technical Group has identified the following water quality parameters of concern to beneficial uses: mercury, selenium, trace metals (copper, cadmium, and zinc), pesticides (carbofuran, chlorodane, chloropyrifos, DDT, diazinon, PCBs, and

toxaphene), drinking water disinfection by-product precursors (bromide and total organic carbon), dissolved oxygen and oxygen reducing substances, ammonia, salinity (total dissolved solids), temperature, turbidity and sedimentation, pathogens, nutrients (nitrogen and phosphorus), pH (alkalinity), chloride, boron, sodium absorption ratio, and toxicity of unknown origin. These parameters provide the focal points for developing and implementing the CALFED Program's water quality actions. The July 2000 Water Quality Program Plan, a technical appendix to the CALFED Program's Final Programmatic EIS/EIR, provides a full description of the WQP. Individual projects pursued under the WQP will fully evaluate all alternatives during tiered environmental review and will fully analyze and address effects under NCCPA and/or CESA and section 7 or section 10 of the ESA.

Water Quality Program Plan

The Water Quality Program, largely through its agency-stakeholder Water Quality Technical Group, has developed programmatic actions to address water quality parameters of concern and beneficial use impairments. Water quality impairments or problems and associated programmatic actions to treat these problems are described in the WQP Plan. The WQP Plan is organized by the following sections: low dissolved oxygen and oxygen depleting substances, drinking water, mercury, pesticides, organochlorine pesticides, salinity, selenium, trace metals, turbidity and sedimentation, toxicity of unknown origin, and a section on implementation strategy. The environmental water quality components, including proposed actions, were transferred to and are now administered under the ERP. However, to maintain consistency between the Draft Programmatic EIS and Final Programmatic EIS, CALFED Agencies have left the environmental components in the WQP Plan.

Proposed Water Quality Program Stage 1 Actions

The CALFED Agencies will evaluate the following water quality actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the WQP Plan.

General Water Quality Actions

- Prepare project level environmental documentation and permitting as needed (yr 1-7).
- Coordinate with other CALFED Program elements to ensure that in-Delta actions maximize potential for Delta water quality improvements (yr 1-7).
- Continue to clarify use of and fine-tune water quality performance targets and goals (yr 1-7).

Environmental Water Quality Actions

Conduct the following mercury evaluation and abatement work:

Cache Creek:

- Risk appraisal and advisory for human health impacts of mercury (yr 1-5).
- Support development and implementation of Total Maximum Daily Load (TMDL) for mercury (yr 1-7).
- Determine bioaccumulation effects in creeks and the Delta (yr 1-4).
- Source, transport, inventory, mapping and speciation of mercury (yr 1-7).
- Information Management/Public Outreach (yr 5-7).
- Participate in Stage 1 remediation (drainage control) of mercury mines as appropriate (yr 3-5).
- Investigate sources of high levels of bioavailable mercury (yr 4-7).

Sacramento River:

- Investigate sources of high levels of bioavailable mercury; inventory, map, and refine other models (yr 3-7).
- Participate in remedial activities (yr 7).

Delta:

- Research methylization (part of bioaccumulation) process in Delta (yr 1-2).
- Determine sediment mercury concentration in areas that would be dredged during levee maintenance or conveyance work (yr 3-7).
- Determine potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms (yr 3-5).

Conduct the following pesticide work:

- Develop diazinon and chlorpyrifos hazard assessment criteria with the DFG and the Department of Pesticide Regulations (yr 1).
- Support development and implementation of a TMDL for diazinon (yr 1-7).
- Develop BMPs for dormant spray and household uses (yr 1-3).
- Study the ecological significance of pesticide discharges (yr-1-3).
- Support implementation of BMPs (yr 2-7).
- Monitor to determine effectiveness (yr 4-7).

Conduct the following trace metals work:

- Determine spatial and temporal extent of metal pollution (yr 3-7).
- Determine ecological significance and extent of copper contamination (yr 1-3).
- Review impacts of other metals such as cadmium, zinc, and chromium (yr 1).

- Participate in Brake Pad Partnership to reduce introduction of copper (yr 1-7).
- Partner with municipalities on evaluation and implementation of stormwater control facilities (yr 2-5).
- Participate in remediation of mine sites as part of local watershed restoration and Delta restoration (yr 2-7).

Conduct the following selenium work:

- Conduct selenium research to fill data gaps in order to refine regulatory goals of source control actions; determine bioavailability of selenium under several scenarios (yr 1-5).
- Evaluate and, if appropriate, implement real-time management of selenium discharges (yr 1-7).
- Expand and implement source control, treatment, and reuse programs (yr 1-7).
- Coordinate with other programs (yr 1-7); e.g., recommendations of San Joaquin Valley Drainage Implementation Program, and CVPIA for retirement of lands with drainage problems that are not subject to correction in other ways.

Conduct the following sediment reduction work/organochlorine pesticides:

- Participate in implementation of the United States Department of Agriculture (USDA) sediment reduction program (yr 1-7).
- Promote sediment reduction in construction areas and urban stormwater, and other specific sites (yr 1-7).
- Implement stream restoration and revegetation work (yr 4-7).
- Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions (yr 4-7).
- Coordinate with ERP on sediment needs (yr 1-3).

Conduct the following work addressing dissolved oxygen (DO) and oxygen depleting substances (including nutrients):

- Complete studies of causes for DO sag in San Joaquin River near Stockton (yr 1-2).
- Define and implement corrective measures for DO sag (yr 1-7).
- Encourage regulatory activity to reduce nutrients discharged by unpermitted dischargers (yr 1-7).
- Develop inter-substrate DO testing in conjunction with the ERP (yr 2-4).
- Study nutrient effects on beneficial uses (yr 4-7).
- Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations (yr 1-7).
- Support finalizing investigation of methods to reduce constituents that cause low DO for inclusion in TMDL recommendation by the Central Valley Regional Water Quality Control Board (yr 2).

- Support finalization of Basin Plan Amendment and TMDL for constituents that cause low DO in the San Joaquin River (yr 2).
- Support implementation of appropriate source and other controls as recommended in the TMDL (yr 3).
- Participate in identifying unknown toxicity and addressing as appropriate (yr 1-7).

Drinking Water Quality Actions

Actions specific to drinking water improvements:

- Work with Bay Area water suppliers as they develop a Bay Area Blending/ Exchange Project (yr 1-7).
- Address drainage problems in the San Joaquin Valley to improve downstream water quality (yr 1-7).
- Implement source controls in the Delta and its tributaries (yr 1-7).
- Support ongoing efforts of the Delta Drinking Water Quality Council (yr 1-7).
- Invest in treatment technology demonstrations (yr 1-7).
- Control runoff into the California Aqueduct and other similar conveyances (yr 1-7+).
- Address water quality problems at the North Bay Aqueduct (yr 1-7).
- Conduct comprehensive evaluations, pilot programs, and full scale actions to reduce Total Organic Carbon (TOC) contribution through control of algae, aquatic weeds, agricultural runoff, and watershed improvements (yr 1-7).
- Improve DO concentrations in the San Joaquin River near Stockton (yr 1-3).
- Study recirculation of export water to reduce salinity and improve DO in the San Joaquin River. If feasible, and consistent with ERP goals and objectives, implement a pilot program (yr 1-4).

Ecosystem Restoration Program

The Ecosystem Restoration Program (ERP) will improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta estuary and its watershed to support sustainable populations of diverse plant and animal species. All CALFED Program elements will contribute in varying degrees to this goal, with the ERP being the principal CALFED Program element designed to restore the ecological health of the Bay-Delta system. The ERP includes actions throughout the Bay-Delta watershed, focusing on the restoration of ecological processes and important habitats. The CALFED Program proposes to improve ecosystem quality for the Bay-Delta system in order to reduce conflicts among beneficial uses of California's water. Individual projects pursued under the ERP will fully evaluate all alternatives during tiered environmental review and will fully analyze and address effects under NCCPA and/or CESA and under section 7 or section 10 of the ESA.

The primary geographic focus area of the ERP is the Sacramento-San Joaquin Delta, Suisun and San Pablo Bay, the Sacramento River below Shasta Dam, the San Joaquin River below the confluence with the Merced River, and their major tributary watersheds directly connected to the Bay-Delta system below major dams and reservoirs. This primary geographic focus area is divided into 14 ecological management zones (discussed in Ecosystem Restoration Program Plan Volume II). The secondary geographic focus area is the upper watersheds surrounding the primary focus area and Central and South San Francisco Bay and their local watersheds.

Success of the CALFED Program hinges upon the full and successful funding and implementation of the ERP, MSCS, other existing and tiered biological opinions, as well as other environmental commitments. Although it is anticipated that some ERP actions will be refined or altered, based upon new information and adaptive management, the successful implementation of nearly all actions is necessary to achieve the species recovery goals identified in the ERP. The ERP is not designed as mitigation for projects to improve water supply reliability or to bolster the integrity of Delta levees. Instead, improving ecological processes and increasing the amount and quality of habitat are co-equal with other CALFED Program goals related to water supply reliability, water quality, and levee system integrity.

The ERP is comprised of a Strategic Plan and a two-volume restoration plan: Volume I which describes the ecosystem elements or attributes (ecological processes, habitats, species and species groups, and anthropogenic stressors) the program addresses; and, Volume II which presents the ecological management zones and proposed programmatic actions.

Ecosystem Restoration Program Strategic Plan and Goals

The ERP Strategic Plan contains the following goals and objectives:

- Goal 1: Achieve recovery of at-risk native species dependent on the Delta and Suisun Bay as the first step toward establishing large, self-sustaining populations of these species; support similar recovery of at-risk native species in San Francisco Bay and the watershed above the estuary; and minimize the need for future endangered species listings by reversing downward population trends of native species that are not listed.
- Goal 2: Rehabilitate natural processes in the Bay-Delta estuary and its watershed to fully support, with minimal ongoing human intervention, natural aquatic and associated terrestrial biotic communities and habitats, in ways that favor native members of those communities.
- Goal 3: Maintain and/or enhance populations of selected species for sustainable commercial and recreational harvest, consistent with the other ERP goals.
- Goal 4: Protect and/or restore functional habitat types in the Bay-Delta estuary and its watershed for ecological and public values such as supporting species and biotic communities, ecological processes, recreation, scientific research, and aesthetics.

- Goal 5: Prevent the establishment of additional non-native invasive species and reduce the negative ecological and economic impacts of established non-native species in the Bay-Delta estuary and its watershed.
- Goal 6: Improve and/or maintain water and sediment quality conditions that fully support healthy and diverse aquatic ecosystems in the Bay-Delta estuary and watershed; and eliminate, to the extent possible, toxic impacts to aquatic organisms, wildlife, and people.

There are several objectives under each goal. ERP goals and objectives are integrated with those of the CALFED Program's MSCS, WQP, and Nonnative Invasive Species Strategic Plan.

The ERP Strategic Plan also presents and describes:

- An ecosystem based management approach for restoring and managing the Bay-Delta ecosystem.
- An adaptive management process that is sufficiently flexible and iterative to respond to changing Bay-Delta conditions and to incorporate new information about ecosystem structure and function.
- The value and application of conceptual models in developing restoration actions and defining information needs, with examples of their development and use.
- Institutional and administrative considerations necessary to implement adaptive management, to ensure scientific credibility of the restoration program and to engage the public in the restoration program.
- Decision rules and criteria to help guide the selection and prioritization of restoration actions.
- Opportunities and constraints to be considered in developing a restoration program.

Ecosystem Restoration Program Plan

The Ecosystem Restoration Program Plan (ERPP) is composed of two volumes. Volume I presents the elements or components of the ERP. These "ecosystem elements" are organized into four categories: ecological processes (e.g., central valley stream flows, Bay-Delta hydrodynamics, bay-delta aquatic foodweb); habitats (e.g., tidal perennial aquatic, saline emergent wetland, riparian and riverine aquatic); species and species groups (species designated for recovery, species designated for contribute to recovery, species assemblages designated for enhance and/or conserve biotic communities, harvested species to be maintained and/or enhanced); and, stressors (e.g., water diversions, nonnative invasive species, contaminants, gravel mining). Consult ERPP Volume I for the complete list and description of ERP ecosystem elements (total of 106 elements).

ERPP Volume II identifies over 600 programmatic actions to be implemented throughout the Bay-Delta estuary and its watershed over the 30-year period of the CALFED Program. Volume

II also gives targets for the ecosystem elements (e.g., acres of tidal fresh emergent wetland to be restored). Volume II is organized by Ecological Management Zones. The primary ERP geographic focus area is divided into 14 Ecological Management Zones: Sacramento-San Joaquin Delta, Suisun Marsh/North San Francisco Bay, Sacramento River, North Sacramento Valley, Cottonwood Creek, Colusa Basin, Butte Basin, Feather River/Sutter Basin, American River Basin, Yolo Basin, Eastside Delta Tributaries, San Joaquin River, East San Joaquin, and West San Joaquin. Each zone is further divided into Ecological Management Units. Under each Ecological Management Zone are the ecosystem elements and associated proposed programmatic actions and restoration targets that the ERP will address in that zone. There is also a section in Volume II that gives ERP targets, MSCS species goal prescriptions, and MSCS conservation measures for species and species groups ecosystem elements.

Proposed Ecosystem Restoration Program Stage 1 Actions

CALFED Agencies will evaluate the following ERP actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the ERP:

- Develop and implement an outreach, coordination, and partnering program with local landowners and individuals, cities, counties, reclamation districts, the Delta Protection Commission, resource conservation districts, water authorities, irrigation districts, farm bureaus, other interest groups, and the general public to assure participation in planning design, implementation, and management of ecosystem restoration projects (yr 1-7).
- Conduct project level environmental documentation and permitting as needed for each bundle of Stage 1 actions (yr 1-7).
- Fully coordinate with other ongoing activities which address ecosystem restoration in the Bay-Delta system; e.g., CVPIA, Four Pumps Agreement, Non-native Invasive Species Task Force (yr 1-7).
- Implement habitat restoration in the Delta, Suisun Bay and Marsh, and Yolo Bypass to improve ecological function and facilitate recovery of endangered species consistent with the goals of the ERP Strategic Plan and MSCS. Habitat restoration efforts in Stage 1 will: restore 2,000 acres of tidal perennial aquatic habitat; restore 200 acres of deep open water nontidal perennial aquatic habitat; restore 300 acres of shallow open water nontidal perennial aquatic habitat; enhance and restore 50 miles of Delta slough habitat; enhance and restore 50 to 200 acres of midchannel islands; restore 8,000 to 12,000 acres of fresh emergent (tidal) wetlands; restore 4,000 acres of fresh emergent (non-tidal) wetlands; restore 25 miles of riparian and riverine aquatic habitat; restore 1,000 to 2,000 acres of perennial grassland; and establish 8,000 to 12,000 acres of wildlife-friendly agricultural habitat. These actions represent approximately one-fourth of the acreage identified in the ERP to be restored during the 30-year implementation period (yr 1-7).

- Implement large-scale restoration projects on select streams and rivers (e.g., Clear Creek, Deer Creek, and the Tuolumne River) that would include implementation of all long-term restoration measures in coordination with the watershed management common program and monitoring of subsequent ecosystem responses to learn information necessary for making decisions about implementing similar restorations in later stages (yr 1-7).
- Implement an EWA that acquires water for ecosystem and species recovery needs, substantially through voluntary purchases in the water transfer market in its first few years and developing additional assets over time (yr 1-7).
- Pursue full implementation of ERP upstream flow targets, over and above EWA assets and regulatory actions, through voluntary purchases of at least 100,000 acre-feet of water by the end of Stage 1. Evaluate how the ERP water acquisitions and EWA water acquisitions will be integrated most effectively (yr 1-7).
- Complete targeted research and scientific evaluations needed to resolve the high priority issues and the uncertainties identified in the ERP Strategic Plan (e.g., instream flow, non-native organisms, and Bay-Delta food web dynamics) to provide direction for implementing the adaptive management process and information necessary for making critical decisions in later stages (yr 1-7).
- Establish partnerships with universities for focused research (yr 1-7).
- Acquire floodplain easements, consistent with ecosystem and flood control needs along the Sacramento and San Joaquin Rivers (yr 4-7).
- Continue high priority actions that reduce direct mortality to fishes (yr 1-7):
  - Screen existing unscreened or poorly screened diversions in the Delta, on the Sacramento River, San Joaquin River, and tributary streams based on a systematic priority approach.
  - Remove select physical barriers to fish passage.
- Continue gravel management, e.g., isolate gravel pits on San Joaquin River tributaries and relocate gravel operations on Sacramento River tributaries. Most gravel work would be implemented in subsequent stages with designs and plans for ecosystem reclamation of gravel mining sites (yr 1-7).
- Develop and begin implementing a CALFED Program comprehensive non-native (exotic) invasive species prevention, control, and eradication plan including the following (yr 1-7):
  - Implement invasive plant management program in Cache Creek.
  - Develop ballast water management program.
  - Develop early-response invasive organism control programs.
  - Evaluate CALFED Program implementation actions and how those actions may benefit non-native species to the detriment of native species or the Bay-Delta ecosystem.
- Provide incremental improvements in ecosystem values throughout the Bay-Delta system in addition to habitat corridors described above, e.g., pursue actions that are opportunity-

based (willing sellers, funding, permitting), provide incremental improvements on private land through incentives, and develop partnerships with farmers on "environmentally friendly" agricultural practices (yr 1-7).

- Incorporate ecosystem improvements with levee associated subsidence reversal plans (yr 1-7).
- Evaluate the feasibility of harvest management to protect weaker fish stocks (yr 1-7).
- Implement projects on selected streams to provide additional upstream fishery habitat by removing or modifying barriers (yr 1-7).
- Assist in the preparation of detailed, ecosystem-based restoration and recovery plans for any priority species identified in the ERP Strategic Plan and the MSCS for which up-to-date plans are not available. Begin implementing appropriate additional restoration actions identified in these plans (yr 1-7).
- Identify and advance specific regional ERP goals (yr 1-7).

Additional draft ERP Stage 1 actions are presented by Ecological Management Zone in Appendix D of the ERP Strategic Plan.

Water Use Efficiency Program

The Water Use Efficiency Program (WUE) relies on a combination of technical assistance, incentives, and directed studies for the four WUE program elements: Agricultural Water Conservation, Urban Water Conservation, Water Recycling, and Managed Wetlands.

Technical assistance programs and directed studies will begin for all four elements. Incentive programs will be designed to award CALFED Program grant funding for projects that demonstrate potential to provide the CALFED Program water supply reliability, water quality, or ecosystem restoration benefits.

The WUE Program includes water conservation and water recycling actions to facilitate efficient use of water at the regional and local level. Individual projects pursued under the WUE will fully evaluate all alternatives during tiered environmental review and will fully analyze and address effects under NCCPA and/or CESA and section 7 or section 10 of the ESA. The programmatic water use efficiency actions include the following:

Water Conservation Related Actions

- Work with the California Urban Water Conservation Council and the Agricultural Water Management Council (AWMC) to identify appropriate urban and agricultural water conservation measures, set appropriate levels of effort, and, in the case of the urban effort,

identify a proper entity and process to certify or endorse water suppliers that are implementing cost-effective feasible measures.

- Expand State and Federal programs to provide sharply increased levels of planning, technical, and financing assistance and develop new ways of providing assistance in the most effective manner.
- Assist urban water suppliers comply with the Urban Water Management Planning Act.
- Assist water suppliers and water users to identify and implement water management measures that can yield multiple benefits, including improved water quality and reduced ecosystem impacts.
- Identify and implement practices to improve water management on managed wetlands.
- Gather better information on water use, identify opportunities to improve water use efficiency, and measure the effectiveness of conservation practices.
- Identify, in region-specific Strategic Plans for Agricultural Areas, quantifiable objectives to assure improvements in water management.

Water Recycling Actions

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

Proposed Water Use Efficiency Stage 1 Actions

CALFED Agencies will evaluate the following WUE actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the WUE Program.

- Expand existing State and Federal agricultural Water Conservation Programs to support on farm and district efforts. Expand State and Federal programs to provide technical and planning assistance to local agencies and districts in support of local and regional conservation and recycling programs (yr 1-7).
- Expand existing State and Federal conservation programs to support urban water purveyor efforts. Expand State and Federal programs to provide technical and planning assistance in support of conservation and recycling programs (yr 1-7).
- Utilize AB 3616 of the Agricultural Water Management Council to evaluate and endorse Agricultural Water Management Plans to implement cost-effective water management

practices by agricultural districts. Identify and secure ongoing funding sources for Agricultural Water Management Council and its members seeking to actively participate in the development, review, and implementation of these plans (yr 1-7).

- Develop Urban Water Management Plan Certification Process - Select an agency to act as certifying entity, obtain legislative authority, carry out public process to prepare regulations, and implement program (yr 1-3).
- Implement Urban BMPs Certification Process. Implement a process for certification of water suppliers' compliance with terms of the Urban Memorandum of Understanding (MOU) with respect to BMPs analysis and implementation for urban water conservation. Provide funding support for the California Urban Water Conservation Council (CUWCC) to carry out this function (yr 1-7).
- Prepare a program implementation plan, including a proposed organizational structure consistent with the overall CALFED Program governance structure, for a competitive grant/loan incentive program for WUE (yr 1). This will include:
  - Incentives in the agricultural sector that will consider several factors, including: (i) potential for reducing irrecoverable water losses; (ii) potential for attaining environmental and/or water quality benefits from WUE measures which result in reduced diversions; (iii) regional variation in water management options and opportunities; (iv) availability and cost of alternative water supplies; and (v) whether the recipient area experiences recurrent water shortages due to regulatory or hydrological restrictions. Many of these factors are included in the Quantifiable Objectives for Agricultural Water Use Efficiency, and as such, the Quantifiable Objectives will be an important component of the agricultural incentive criteria.
  - Incentives in the urban sector will assist in identifying and implementing urban water conservation measures that are supplemental to BMPs in the Urban MOU process and are cost effective from a Statewide perspective.
  - Incentives for water recycling in the urban and agricultural areas.
  - Annual reporting and evaluation mechanisms to gauge effectiveness of the program.
- Finalize and implement the methodology for Refuge Water Management which was described in the June 1998 "Interagency Coordinated Program for Wetland Water Use Plan, Central Valley, California" (yr 1-3).
- Research effort to establish appropriate reference conditions for evaluating program progress, and to identify improved methods for WUE (yr 1-7).
- Assess the need for additional water rights protections. Evaluate the need for additional State regulations or legislation providing protection for water right holders who have implemented WUE measures and subsequently transferred water to other beneficial uses (yr 1-4).
- Water Management. Develop State legislation that requires appropriate measurement of water use for all water users in California (yr 1-3).

- Create a Public Advisory Committee to advise State and Federal agencies on structure and implementation of assistance programs, and to coordinate State, Federal, regional and local efforts for maximum effectiveness of program expenditures (yr 1).

Water Transfer Program

The CALFED Program's Water Transfer Program (WTP) will encourage the development of a more effective water transfer market that facilitates water transfers and streamlines the approval process while protecting water rights, environmental conditions, and local economic interests. CALFED Agencies have legal and regulatory responsibility for review and approval of most water transfers and also have jurisdiction over many of the storage and conveyance facilities required to make water transfers work. These agencies are in a position to improve or facilitate the operations of the water market by adopting policies and implementing programs that will allow transfers to be completed efficiently while protecting the environment. The Strategic Plan for Implementation provides direction and prioritization for implementation of the CALFED Program's Water Transfer Program, and includes the following actions:

Interactive California Water Market Information Web Site

- Develop the On Tap on-line water market information source for California water transfers.

Environmental, Socio-economic, and Water Resource Protection

- Recommend establishment of a California Water Transfers Information Clearinghouse to ensure that decisions regarding proposed water transfers can be made with all parties in possession of complete and accurate information and to facilitate assessment of potential third party impacts.
- Require additional water transfer analysis regarding direct and indirect impacts. The DWR, Reclamation, and the State Water Resources Control Board (SWRCB) will require transfer proponents to provide analysis of the direct and indirect impacts of a proposed transfer, in addition to CEQA, ESA compliance or other environmental requirements.
- Develop improved tracking protocols to ensure that water transferred to an instream flow can be tracked and then delivered to the intended destination.
- Work with stakeholders and the State Legislature to assist local agencies in development of groundwater management programs to protect groundwater basins in water transfer source areas.

Technical, Operational, and Administrative Rules

- Work to streamline the current water transfer approval processes through development of new tools, clarification of existing policies, refinement of processes and addition of staff and resources.
- Work with stakeholder representatives to clarify and define what water is deemed transferrable under what conditions.
- Work with stakeholder representatives to resolve conflicts over carriage water criteria.
- Work with stakeholder representatives to develop criteria that protect other legal users of water from injury as a result of refill of a reservoir after the transfer of stored water.

Wheeling and Access to State/Federal Facilities

- Improve forecasting tools and more widely disclose potential pumping and conveyance capacity in project facilities, including limiting factors and inherent risks.
- Work with stakeholder representatives to consider modification of policies and procedures for transporting non-project water through existing project water conveyance facilities.
- Work with stakeholder representatives to develop cost criteria associated with transporting transferred water through State or Federal conveyance facilities.

Proposed Water Transfer Program Stage 1 Actions

CALFED Agencies will evaluate the following actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the Water Transfer Program.

- Develop an Interactive Water Transfer Information Web-site. CALFED Agencies will develop, implement, and maintain an interactive, publicly available web-site called On TAP (by the end of year 2000) (yr 1).
- Establish the California Water Transfers Information Clearinghouse to operate and maintain the On Tap web-site, collect and disseminate data and information relating to water transfers and potential transfer impacts, and perform research using historic data to understand water transfer impacts (by year 2001) (yr 1).
- Coordinate with CALFED Agencies to require water transfer applicants to provide additional impact assessment information (yr 1-4).
- Identify, arrange, fund, and carry out a specific number of targeted water transfers for in-stream environmental purposes as part of the ERP, with a goal of using these transfers to evaluate the effectiveness of and make any necessary improvements to the California Water Code Section 1707 procedures and tracking protocols (yr 1-3).

- Establish a groundwater assistance program to fund studies to gather groundwater data and to enable local entities to develop and implement local groundwater management/monitoring programs (yr 1-2).
- Develop a streamlined water transfer approval process including "pre-certification" of certain classes of transfers and expedited environmental review procedures (yr 1-6).
- Work with stakeholder representatives to clarify and define what water is deemed transferrable under what conditions (yr 1-3).
- Continue to work with stakeholder representatives to resolve conflicts over carriage water criteria (yr 1-3).
- Establish a refill criteria policy for reservoir storage based water transfers (yr 1).
- Begin forecast and disclosure processes of potential conveyance capacity in existing export facilities (Reclamation and DWR). This would be an on-going activity, occurring in conjunction with hydrologic forecasts (yr 1-7).
- Work with stakeholders to develop an agreed upon set of criteria and procedures governing the determination of transport system availability and costs, including the procedures to determine the fair reimbursement to the water conveyance facility operator (yr 1-3).

Watershed Program

The Watershed Program will use a comprehensive, integrated, basin-wide approach with a goal to improve conditions in the Bay-Delta system. This Watershed Program will emphasize local participation and provide financial and technical assistance for local watershed stewardship, and promote coordination and collaboration among watershed efforts.

The geographic scope of the Watershed Program encompasses the entire scope of the CALFED Program. The Watershed Program will support activities that provide benefits to the Delta, Suisun Bay, and Suisun Marsh.

The Watershed Program covers a broad geographic range and currently lacks project-specific measures for evaluation. Individual projects pursued under the Watershed Program will fully evaluate all alternatives during tiered environmental review and will fully analyze and address effects under NCCPA and/or CESA and section 7 or section 10 of the ESA. CALFED will ensure that appropriate measures to conserve special status species are included in all program actions.

There are five Watershed Program elements: coordination and assistance; adaptive management and monitoring; education and outreach; integration with other CALFED Program elements; and watershed processes and relationships. These elements, associated proposed programmatic actions, and an implementation strategy are described in the Watershed Program Plan.

The primary objectives of the Watershed Program are:

- Facilitate and improve coordination, collaboration, and assistance among government agencies, other organizations, and local watershed groups.
- Develop watershed monitoring and assessment protocols.
- Support education and outreach.
- Integrate the Watershed Program with other CALFED Program elements.
- Define the relationship between watershed processes and the goals and objectives of the CALFED Program.
- Implement a strategy that will ensure support and long term sustainability of local watershed activities.

Watershed activities will be supported that:

- are community based
- are collaborative and are consistent with the CALFED Program
- address multiple watershed issues
- are coordinated with and supported at multiple levels
- provide ongoing implementation
- include monitoring protocols
- increase learning and awareness.

Proposed Watershed Program Stage 1 Actions

The CALFED Program will evaluate the following Watershed Program actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the Watershed Program Plan.

- Fund and implement community based watershed restoration, maintenance, conservation, and monitoring activities that support the goals and objectives of the CALFED Program (yr 1-7).
- Assist local watershed groups and government agencies to address common issues, including roles and responsibilities, funding support, technical assistance, information exchange, and to ensure effective communication and implementation among government agencies and stakeholder groups (yr 1-7).
- Implement a funding process and provide watershed stewardship funds to build the capacity of locally controlled watershed groups that ensure participation of local landowner groups (yr 1-7).
- Improve the use and usefulness of existing or future watershed information management

functions to provide data and other information to people involved in watershed management (yr 3-7).

- Ensure the completion of project level environmental documentation and permitting; assist with documentation and permitting processes as appropriate (yr 1-7).
- Evaluate the benefits that accrue from watershed plans and projects designed to achieve CALFED Program goals and objectives (yr 3-7).
- Establish, fund, and maintain watershed restoration and maintenance assistance to aid local watershed groups and private landowners in project concept, design, and implementation (yr 1-7).
- Collaborate with other CALFED Program and non-CALFED Program elements on watershed related activities (yr 1-7).
- Provide appropriate information and assistance to stakeholders and the State Legislature to develop a Statewide umbrella Watershed Management Act (yr 1).

***Water Management Strategy* (WMS)**

The Water Management Strategy (WMS) describes a framework to coordinate and integrate the water management tools in the program, evaluate the success of implementation efforts, and select additional tools needed to achieve the CALFED Program's water reliability objectives. The CALFED Program has identified three primary goals for the WMS: increase the utility of available water supplies (making water suitable for more uses and reuses); improve access to existing or new water supplies in an economically efficient manner, for environmental, urban and agricultural beneficial uses; and, improve flexibility of managing water supply and demand in order to reduce conflicts between beneficial uses and decrease system vulnerability.

The tools that will be used to achieve the goals and objectives of the WMS include: the WUE Program (agricultural, urban, and wetland water conservation and water recycling); the Water Transfer Program; Conveyance, including South Delta Improvements; Storage; and, operational strategies, such as real-time diversion management and an EWA. In addition to these primary tools, the WMS will rely on additional CALFED Program tools to provide additional benefits. These include the Watershed Program, the Water Quality Program, and real-time monitoring through the Science Program.

Storage

The CALFED Program has initiated the Integrated Storage Investigation (ISI) to provide a comprehensive assessment of alternative surface and groundwater storage options and their utility to overall water management.

Decisions to implement new or expanded surface and groundwater storage will be predicated

upon completing site-specific feasibility studies and complying with all environmental review and permitting requirements. Individual storage projects pursued under the WMS will fully evaluate project-level alternatives that are consistent with the decision documents in selecting the least environmentally damaging practicable alternative at the time of the permit decision unless new information is submitted at the time of the Section 404 permit process indication that the programmatic level information is incorrect or incomplete in some material manner. The level of analysis is conditioned on the programs and related commitments of the CALFED Program, including those related to water use efficiency, water transfers, and the ERP, being implemented. Direct and indirect effects will be addressed under NCCPA and/or CESA and section 7 or section 10 of the ESA.

Site-specific studies of storage opportunities will be coordinated under the ISI. Specifically, the ISI will evaluate surface storage, groundwater storage, power facility re-operation, and removal of barriers to fish passage and, where appropriate, the potential for conjunctive operation of these different types of storage. These investigations will contribute to compliance with the requirements, within the Clean Water Act Section 404 Guidelines, to select the least environmentally damaging practicable alternative to improving storage.

The range of total new storage evaluated in Phase II was from zero up to about six Million acre- feet (MAF). Maximum Sacramento River off-stream or enlarged on-stream surface storage potential is estimated to be about three MAF of storage, while south of Delta off-aqueduct surface storage potential is estimated to be about two MAF of storage. Other types of surface storage considered in Phase II include San Joaquin River tributary storage and in-Delta storage. The CALFED Program will evaluate the feasibility of expanding two existing reservoirs and constructing a new off-stream reservoir with a total capacity of 950 thousand-acre-feet (TAF); and a major expansion of groundwater storage for an additional 500 TAF to one MAF. In addition, the CALFED Program will study two potential reservoir locations through partnerships with local agencies.

The CALFED Program will continue to evaluate surface and groundwater storage opportunities; initiate permitting; NEPA and CEQA documentation; and proceed with construction, only if all conditions are satisfied. In addition, the CALFED Program will continue to refine and periodically update the WMS. ISI studies will evaluate the utility of specific storage projects in providing water quality, water supply reliability, and ecosystem benefits. This information, together with information gained from implementation of other CALFED Program elements and updated information on California's changing water management needs, will be considered in an Evaluation Framework. This Evaluation Framework will include: 1) a comprehensive hierarchy of objectives for the CALFED Program; 2) well-defined measures of performance associated with the achievement of objectives; and 3) a basis for comparison of alternative long-term water management strategies. The Evaluation Framework will provide a

structure for periodically updating the WMS and determining appropriate levels of the future investment in various water management tools.

Proposed Stage 1 Storage Actions

The CALFED Program will evaluate the following Storage actions proposed for implementation during Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the Storage Program. Each will require project-specific consultation under NCCPA and/or CESA and section 7 of the ESA prior to authorization and construction.

Groundwater Banking and Conjunctive Use

The goal is to develop locally managed and controlled groundwater and conjunctive use projects with a total of 500 TAF to one MAF of additional storage. This effort includes developing partnerships with local agencies and landowners in both the north-of-Delta and south-of-Delta areas, and includes the potential construction of several south-of-Delta projects. Additional south-of-Delta and north-of-Delta projects, if feasible, could be constructed in later stages.

- Finalize agreements with new local project proponents for joint planning and development (yr 1).
- Begin feasibility studies (yr 1).
- Report on the performance of feasibility studies, implemented projects, and potential benefits and beneficiaries (yr 3).
- Implement early stages of the most promising projects (yr 1-5).
- Pursue implementation of additional projects (yr 1-7).
- Support legislation that supports groundwater management by local agencies at the sub-basin level.

Surface Storage

CALFED Agencies identified a list of twelve potential surface storage projects that are in varying stages of the environmental review or feasibility process. Actions taken in Stage 1 will focus on completing the necessary studies (technical work and environmental reviews) needed before implementing or proceeding with the six surface storage projects:

- In-Delta storage project (approximately 250 TAF). CALFED will evaluate leasing or purchasing the Delta Wetlands project, and will evaluate initiating a new project, in the event that Delta Wetlands proves cost prohibitive or infeasible (Planning: yr 1-2, Construction: yr 3-7).

- Evaluate expanding CVP storage in Shasta Lake by approximately 300 TAF by raising the Shasta Dam by three to six feet (Planning: yr 1-4, Construction yr 2004).
- Evaluate expanding Los Vaqueros Reservoir by up to 400 TAF with local partners as part of a Bay Area water quality and water supply reliability initiative. As an existing reservoir operated by the Contra Costa Water District (CCWD), the Los Vaqueros Reservoir is subject to a number of mandates, agreements, and requirements in existing biological opinions. CALFED intends to work with CCWD and interested stakeholders to assure that previous commitments, including local voter approval required for expansion, are maintained (yr 1-7).
- Evaluate off-stream storage at Sites Reservoir, with a project capacity of up to 1.9 MAF (yr 1-5).
- Evaluate additional storage options in the upper San Joaquin River watershed. Consider additional storage capacity of between 250-700 TAF (yr 1-6).
- Evaluate enlarging Millerton Lake at Friant Dam or a functionally equivalent storage program in the region. The CALFED Program will join local partners to evaluate this project in Stage 1 (yr 1-6).

Power Facilities Re-operation Evaluation

Evaluate the potential to re-operate some hydroelectric facilities to produce ecosystem benefits and water supply. The following ISI actions may be taken:

- Identify beneficiaries and negotiate cost sharing agreements (yr 1-7).
- Work with CALFED Agencies, the Public Utilities Commission, the SWRCB, the Federal Energy Regulatory Commission, and interested stakeholders to identify re-operation opportunities (yr 1-2).
- Develop environmental documentation on re-operation (yr 3-5).
- Perform feasibility studies and economic analyses (yr 3-5).
- Obtain permits, negotiate operating agreements, and seek site specific authorization including section 7 authorization. This may require design of facilities modifications to accommodate new operational priorities (yr 5-7).

Fish Migration Barrier Removal Evaluations

As part of the ERP some obstructions to fish passage, such as small dams, are being considered for modification or removal in order to restore anadromous fish access to critical spawning habitat. ISI actions also include the role of barrier removal. The following actions will be taken:

- Work with CALFED Agencies, the SWRCB, local water agencies, and interested

stakeholders to identify opportunities for modification or removal of obstructions such as small dams (yr 1-2).

- Develop environmental documentation (yr 3-5).
- Perform feasibility studies and economic analyses (yr 3-5).
- Obtain permits, negotiate agreements, and seek site specific authorization as required. This may require design on facilities modifications or removal actions. (yr 5-7).
- Identify beneficiaries and negotiate cost sharing agreements (yr 5-7).
- Begin construction (if needed) and begin new operations if conditions and linkages are satisfied (yr 6-7).

Conveyance

The CALFED Program will evaluate a through-Delta approach to conveyance based upon the existing Delta configuration with some modifications. The CALFED Program will evaluate the effectiveness of this conveyance approach, and add additional conveyance and/or other water management actions if necessary. The initial through-Delta conveyance will be continually monitored, analyzed, and improved to maximize the potential of the through-Delta approach to meet CALFED Program goals and objectives, consistent with the CALFED Program's Solution Principles. In the event of a finding that a through-Delta conveyance system is inadequate to achieve CALFED Program goals and objectives, additional actions may be implemented. The CALFED Program may also evaluate and pursue: 1) an isolated conveyance facility (a canal connecting the Sacramento River in the northern Delta to the SWP and CVP export facilities in the southern Delta); 2) source water blending or substitution; and/or 3) other actions through supplemental programmatic analysis.

As part of the Conveyance Program, the CALFED Program has incorporated the south Delta and north Delta regions to address conveyance improvements and related problems in Stage 1. Conveyance improvements for the South Delta set forth in the Final Programmatic EIR/EIS are identified as allowing SWP export capacity to increase from the current authorized levels with seasonal increases, as authorized in Corps Permit PN5820A. The proposed increases would allow up to 8,500 cfs pumping in 2003 and ultimately up to 10,300 cfs at the end of Stage 1. The EIR/EIS identifies a number of measures that will be part of the conveyance modifications including new fish screens, ecosystem restoration as part of the ERP, permanent operable barriers or their functional equivalent in selected South Delta channels, and other measures.

Improvements in export capabilities will be accompanied by associated operations which will maintain diversion capabilities for south Delta water users and provide for fish protection. CALFED implementing documents set forth a schedule for securing appropriate regulatory permits and completing a project-specific operations plan that addresses the potential impacts of increased pumping. This plan will need to reflect the nature and timing of the construction and operation of

new project facilities and implementation of ecosystem improvements, and a more specific project description following completion of additional planning and environmental studies.

Decisions to implement conveyance actions will be predicated upon completing site-specific feasibility studies and complying with all environmental review and permitting requirements. Individual conveyance projects pursued under the WMS will fully evaluate all alternatives during tiered environmental review and will fully analyze and address direct and indirect effects under NCCPA and/or CESA and section 7 or section 10 of the ESA. Operational rules and facilities needed for use of additional export capability will be determined during ESA consultation on the project-specific environmental documentation prepared for the various conveyance elements.

Proposed Conveyance Stage 1 Actions (South Delta)

The CALFED Program will evaluate the following Conveyance actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions in the Conveyance Program.

- Pursue construction and evaluation of a 500 cfs test facility at the Tracy Pumping Plant to develop best available fish screening and salvage technology for the intakes to the SWP and CVP export facilities (yr 1-7).
- Pursue authorization for construction of a new screened intake for Clifton Court Forebay for the full export capacity of the SWP (yr 1-7).
- Implement the Joint Point of Diversion for the SWP and CVP (yr 1-7).
- Evaluate and decide on whether to retain a separate CVP intake facility or to consolidate with the SWP facility. An intertie between Clifton Court Forebay and the Tracy Pumping Plant will be required if the export location is consolidated at Clifton Court Forebay and will be evaluated if exports continue at both locations. Also, evaluate and potentially implement an intertie between the projects downstream of the export pumps (yr 1-7).
- Evaluate increased SWP pumping by 500 cfs from July through September (yr 1-4).
- Facilitate interim SWP export flexibility up to 8,500 cfs, with appropriate environmental constraints including ESA requirements (yr 4).
- Obtain permits including ESA authorization to use full SWP capacity of 10,300 cfs, consistent with all applicable operational constraints, for water supply and environmental benefits (yr 7).
- For purposes of the project level environmental analysis for the South Delta Improvements, evaluate various operable barrier configuration alternatives or their functional equivalents. All barrier operations will be done in conjunction with water operations to avoid impacts to fish. Potential barriers include the installation of a permanent fish migration barrier at the Head of Old River, and the construction of three permanent flow control structures at Old River at Tracy, Middle River upstream of Victoria Canal, and at Grant Line Canal. The

Grant Line Canal barrier would be constructed and operated in accordance with conditions and directions specified by the Service, DFG, and NMFS. (yr 1-7).

- Monitor barrier effects on fish, stages, circulation, and water quality (yr 1-7).
- Evaluate the dredging of selected channel segments (yr 3-7).

Additional Actions Required During Stage 1 (South Delta)

- Implement south Delta ERP goals (yr 1-7).
- Consolidate, extend, and screen local agricultural diversions based on priority and initiate a screen maintenance program (yr 1-7).
- Develop a strategy to resolve regional water quality problems including actions to improve San Joaquin River DO conditions and the San Joaquin River drainage as describe in the CALFED Program's Water Quality Program. Evaluate the feasibility of re-circulation of water pumped from the Delta by the CVP and SWP. If feasible, and consistent with the CALFED Program's ecosystem restoration goals and objectives, implement a pilot program (yr 1-7).
- Continue implementation of the Vernalis Adaptive Management Plan. Include development of a long-term plan describing actions of the San Joaquin River Group Authority to improve water management practices (yr 1-7).

Proposed North Delta Stage 1 Actions

- Evaluate and implement improved operational procedures for the Delta Cross Channel to address fishery and water quality concerns (yr 1-4).
- Evaluate a screened through-Delta facility with a diversion capacity of up to 4,000 cfs on the Sacramento River. This evaluation would consider the effectiveness of water quality measures and how to operate the Delta Cross Channel in conjunction with this new diversion structure to improve drinking water quality, while maintaining fish recovery. If the environmental review demonstrates that this diversion facility is needed to improve water quality in the Delta and at the export facilities, and can be constructed and operated without adverse effects to anadromous and estuarine fish, construction may begin late in Stage 1 subject to NCCPA and/or CESA and section 7 authorization (yr 1-4).
- Evaluate opportunities to resolve local flood concerns and create tidal wetlands and riparian habitat by constructing new setback levees, improving existing levees, and dredging channels in the north Delta, especially the channels of the lower Mokelumne River system. Any proposed channel modifications would be consistent with the CALFED Program's current direction on Delta conveyance and ecosystem goals (yr 1-7).
- Facilitate regionwide coordination of all CALFED Program related projects in the north Delta region (yr 1-7).

Proposed Stage 1 Actions Throughout the Delta Region

- Evaluate how water supplies can best provide a level of public health protection equivalent to Delta source water quality of 50 parts per billion (ppb) bromide and three parts per million (ppm) TOC (yr 1-7). This will include an equivalent level of investigation and studies on all of the actions which could be used to achieve the CALFED Program's targets.
- Evaluate the CALFED Program's progress toward measurable water quality goals and ecosystem restoration objectives, with particular emphasis on fish recovery (yr 6-7).
- Conduct additional environmental review to determine if construction of an isolated conveyance facility component of a dual Delta conveyance (presently not an element of the CALFED Program's Preferred Program Alternative) is warranted. A decision to construct such a facility would require separate environmental review and alternatives analysis that has not been done as part of the CALFED Program's programmatic analysis (yr 1-7).

Additional Actions Required During Stage 1 (Throughout the Delta Region)

- Fully implement actions, consistent with the MSCS, that mitigate for the direct and indirect environmental affects of project features and actions (yr 1-7).
- Improve flood control through levee improvements, levee setbacks, channel dredging, and floodplain restoration to be fully consistent with regional ERP actions (yr 1-7).
- Screen agricultural intakes to assure ecosystem protection (yr 1-7).

Environmental Water Account

An essential goal of the CALFED Program is to provide increased water supply reliability to water users while at the same time assuring the availability of sufficient water to meet fish protection and restoration\recovery needs as one part of the overall ERP. As a means to achieve these objectives, the CALFED Program will provide commitments under NCCPA and/or CESA and ESA to SWP and CVP export facilities only for the first four years of Stage 1. These commitments are based on fully providing water from existing regulatory means, a fully implemented EWA, flows and habitat restoration provided through the ERP, and the ability to obtain additional assets should they be necessary.

The EWA is a new water source provided to: (1) augment instream flows and Delta outflows; and (2) reduce Delta exports from CVP/SWP export facilities during key periods of fish and aquatic ecosystem concerns. The CALFED Agencies will also continue to work with other diverters in the Delta watershed to resolve local fishery-diversion conflicts based on the site-specific needs and opportunities for each diversion. The CALFED Agencies have crafted the EWA so that it has no effect on the existing water rights of other water right holders in the watershed.

Overall Purpose, Framework and Administration

The EWA will be established, as part of the **EWA Operating Principles Agreement**, to provide water for the protection and recovery of fish in addition to water available through existing regulatory actions related to project operations. The EWA Operating Principles Agreement will be interpreted to be consistent with this project description. To the extent that the EWA Operating Principles Agreement provides greater specificity, the EWA Operating Principles Agreement will be the controlling document.

The EWA will be funded jointly by the State and Federal governments and will be authorized to acquire, bank, transfer and borrow water and arrange for its conveyance. EWA assets will be managed by the State and Federal fishery agencies (the Service, NMFS, and DFG) in coordination with project operators and stakeholders. Initial acquisition of assets for the EWA will be made by Federal and State agencies (Reclamation and DWR). Subsequently, it is anticipated that acquisitions may be made pursuant to a public process that may take advantage of other agencies or third parties to acquire assets.

Baseline Level of Protection

DWR and Interior will provide a baseline of environmental protection. The CALFED Agencies recognize that the SWRCB may adjust the CVP and SWP responsibilities for complying with the 1995 Delta Water Quality Control Plan (WQCP), as part of its on-going Bay-Delta Water Rights Hearings. The outcome of those hearings may affect the nature of this baseline. The CVP's and SWP's regulatory baseline, primarily for fish needs, identified as Tier 1 in the EWA discussion below, will include:

- **1993 Winter-run Salmon Biological Opinion (NMFS)**

- **1995 Delta Water Quality Control Plan (SWRCB)**
  At this time, DWR and Reclamation are responsible for meeting flow related objectives contained in this plan. The CALFED Agencies recognize that the SWRCB may adjust the responsibilities of these and other entities for complying with the 1995 Delta Water Quality Control Plan, as part of its ongoing Bay-Delta Water Rights hearings. Adjustment of responsibility to meet the Plan does not affect the baseline level of protection for purposes of the EWA.

  CALFED Agencies will develop a strategy to deal with the rare circumstances when the CVP obligation under the WQCP exceeds the 450 TAF annual cap for use of CVPIA Section 3406(b)(2) water. In conjunction with the Governor's Drought Contingency Plan, the Agencies will use their available resources to create an insurance policy to eliminate impacts to water users, while not adversely affecting other uses.

- **1995 Delta Smelt Biological Opinion (Service)**
  The export curtailment contained in the 1995 Delta Smelt Biological Opinion (item 2 on page 19), commonly referred to as the " 2 to 1 inflow/export ratio", will be met by the Section 3406(b)(2) of the CVPIA and EWA. This objective calls for the SWP and CVP to reduce combined exports, below what is allowed in the 1995 Water Quality Control Plan (the 1995 WQCP allows exports to be 100% of the base San Joaquin River flow at Vernalis during the April-May pulse period), during a 31-day period in April and May. Reclamation and the Department of Water Resources intend that the reduced export pumping during this period will not reduce allocations to SWP. The CVP reduction in pumping will be conducted pursuant to the accounting policy for Section 3406(b)(2) of the CVPIA and/or through reimbursement by the EWA. The SWP will be reimbursed by the EWA for its participation in reducing exports pursuant to the 2 to 1 inflow/export ratio.

  It should be noted that the CVP and SWP will be operated pursuant to the terms of the San Joaquin River Agreement. While the SJRA is in effect, the exports may be reduced beyond what is called for by the 2 to 1 inflow/export ratio and San Joaquin River flows may be augmented by water acquired from upstream sources during that same time period. Such an augmentation will not be included as part of the SWP share of Vernalis flow. While operating per the SJRA, the SWP will receive reimbursement from the EWA or pursuant to Section 3406(b)(2) for the difference between its 2 to 1 export and its export under the SJRA; and the additional CVP curtailment will be accounted for under the policy for Section 3406(b)(2) or reimbursed under the EWA.

- **Full Use of 800 TAF Supply of Water Pursuant to Section 3406(b)(2) of the CVPIA in Accordance with Interior's October 5, 1999 Decision, clarified as follows:**

  Water Resulting from Refill of Reservoirs ("Reset"): Water which is available under the (b)(2) Policy as a result of refill of reservoirs following upstream releases ("reset") will not be used in a manner which results in increased export reductions. Upstream releases of (b)(2) water pumped by the SWP and made availabie to the EWA will not be subject to the "reset" provision.

  Export Curtailments which Result in Increased Storage ("Offset"): Where a prescribed (b)(2) export curtailment result in a reduction in releases from upstream reservoirs and hence increased storage, the charge to the (b)(2) account will be offset to the extent that the increased storage will result in increased delivery (beyond forecast delivery at the time of the export curtailment) to south-of-Delta CVP contractors in the remainder of the water year. If such deliveries cannot be increased in that water year, such additional water stored in upstream reservoirs shall be available for other (b)(2) uses without charge. Where the delivery to export users in the remainder of the water year will

not be increased and end-of-year storage will be increased, there will be no offset to the charge to the (b)(2) account.

The Secretary of the Interior is expected to make a decision later this year on Trinity River flows, pursuant to the original Trinity authorization, the Trinity Restoration Act of 1984, and the CVPIA. The substance of the decision is unknown and therefore cannot be addressed at this time. It is separate and will not be affected by this decision.

Other Environmental Protections

The regulatory baseline above also assumes that other environmental protections contained in biological opinions, regulations or statutes remain in place. These protections include, without limitation, Level 2 refuge water supplies, as required by the CVPIA. The CVP will use its share of the benefits from joint point of diversion, to the extent available, to provide water required by its Level 2 refuge water supply mandates, but using such benefits will not create any limitation on the Level 2 supply available for refuges.

Operation Rules

The ground rules for operating the EWA are detailed in the EWA Operating Principles Agreement, executed by DWR, Reclamation, DFG, the Service, and NMFS. The ground rules are based on the principle that the EWA will provide flows allowing fish recovery while not resulting in uncompensated reductions in deliveries to south of Delta CVP/SWP contractors.

Asset Development

Immediate development of assets for the first year is critical to EWA success. Initial water purchases and lease of groundwater storage will be secured from willing sellers by the end of 2000. In addition to assets to be acquired annually, as shown in Table 1, an initial one-time acquisition of 200 TAF of south-of-Delta storage or its functional equivalent will be acquired from a variety of sources to assure the effectiveness of the EWA and provide assurances for SWP and CVP water supply/deliveries. This initial deposit will also provide collateral for the first year's borrowing. The related storage is intended to function as long-term storage for other EWA assets as they become available.

Borrowing agreements will allow the EWA to borrow water from the CVP and SWP for necessary actions during a water year as long as the water can be repaid without affecting the following year's allocations. To the extent practicable, borrowing from the SWP and CVP will be shared. The limitations on borrowing will be developed as part of the agreement. Source shifting agreements with south-of-Delta water providers for 100 TAF will be used to enhance the

effectiveness of the EWA, and to help provide assurance that SWP and CVP water deliveries will not be affected by EWA operations. To provide regulatory stability during the initial period of Stage 1, the CALFED Agencies will provide a commitment, subject to legal requirements, that for the first four years of Stage 1, there will be no reductions, beyond existing regulatory levels, in CVP or SWP Delta exports resulting from measures to protect fish under the ESA and CESA. This commitment will be based on the availability of three tiers of assets:

- **Tier 1** is baseline water, provided by existing regulation and operational flexibility. The regulatory baseline consists of the biological opinions on winter-run salmon and delta smelt, 1995 Delta Water Quality Control Plan, and 800 TAF of CVP yield pursuant to CVPIA Section 3406(b)(2).

- **Tier 2** consists of the assets in the EWA combined with the benefits of the ERP and is an insurance mechanism that will allow water to be provided for fish over and above Tier 1, when needed without reducing deliveries to water users. Tier 1 and Tier 2 are, in effect, a water budget for the environment and will be used to avoid the need for Tier 3 assets as described subsequently.

- **Tier 3** is based upon the commitment and ability of the CALFED Agencies to make additional water available should it be needed. It is unlikely that assets beyond those in Tier 1 and Tier 2 will be needed to meet ESA requirements. However, if further assets are needed in specific circumstances, Tier 3 will be provided. In considering the need for Tier 3 assets, the fishery agencies will consider the views of an independent science panel. Although the CALFED Agencies do not anticipate needing access to Tier 3 water assets, the CALFED Agencies will prepare an implementation strategy for Tier 3 by August 2001, establish a timely scientific panel process, and identifying tools and funding should implementation of Tier 3 prove necessary.

Table 1. List of EWA assets. Some assets may be replaced by functional equivalents, if determined to be appropriate by the EWA Managing Agencies (Service, DFG, NMFS)

Action Description	Water Available Annually(Average)
SWP Pumping of (b)(2)/ERP Upstream Releases[1]	40,000 acre-feet[2]
EWA Use of Joint Point[3]	75,000 acre-feet
Export/Inflow Ratio Flexibility	30,000 acre-feet
500 cfs SWP Pumping Increase	50,000 acre-feet
Purchases - South of Delta	150,000 acre-feet
Purchases - North of Delta[4]	35,000 acre-feet
TOTAL	380,000 acre-feet
Storage acquisition	200,000 acre-feet of storage, filled when acquired in Year 1
Source-shifting agreement	100,000 acre-feet at any time

[1]The EWA and the SWP will share equally the (b)(2) and ERP upstream releases pumped by the SWP after they have served their (b)(2) and ERP purposes.

[2]The amount of water derived from the first four actions will vary based on hydrologic conditions.

[3]The EWA will share access to joint point, with the CVP receiving 50% of the benefits.

[4]This is the amount of water targeted for the first year; higher amounts are anticipated in subsequent years.

CALFED Science Program

The CALFED Science Program includes implementing the Comprehensive Monitoring, Assessment, and Research Program (CMARP) as an integral aspect of the overall CALFED Program. The scope of the Science Program will encompass all elements of the CALFED Program: ecosystem restoration, water supply reliability, water use efficiency and conservation, water quality, and levees integrity. The purpose of the Science Program is to provide new information and scientific interpretations necessary to implement, monitor, and evaluate the success of the CALFED Program. The Science Program will build on the work of the Interagency Ecological Program and other scientific efforts in the CALFED Program area.

The CALFED Program is organized around the concept of adaptive management because there is incomplete knowledge of how the ecosystem functions, the effects of human stressors on ecosystem structure and function, and the ecological and other effects of individual CALFED Program actions. Monitoring key system functions (or indicators), completing focused research to obtain better understanding, and staging implementation based on information gained are all central to the adaptive management process.

A preliminary CMARP report is an appendix to the Final Programmatic EIS/EIR. This report identified objectives and functions of CMARP, developed a conceptual framework for CMARP, presented a preliminary monitoring and focus research program design, and recommended an institutional structure for CMARP. Some actions pursued under the Science Program will result in take, and therefore will require authorization under NCCPA and/or CESA and section 7 or section 10(a)(1)(B) of the ESA.

Functions of the CALFED Program's Science Program include:

- Developing and refining ecological conceptual models.
- Identifying monitoring and research needs to support implementation and the evaluation of the CALFED Program. This includes program performance measures and indicators; also a monitoring plan for the ERP is being developed.
- Data management, assessment, and reporting.
- Providing for and coordinating independent scientific/technical review of the technical aspects of the CALFED Program.

The institutional structure of the Science Program is not completely determined at this time. The ERP has established an Interim Science Board to provide the ERP with independent scientific guidance and review. The CALFED Program's Management Group has appointed a temporary Science Oversight Team to accomplish the following tasks for the Science Program:

- Develop science questions associated with Stage 1 management decisions.
- Develop functions and structure of the Science Program.
- Develop an initial list of program performance measures and indicators.
- Assess feasibility of a Bay-Delta science center.
- Develop coordination plans for science programs relevant to the CALFED Program.
- Clarify issues of implementing adaptive management under the CALFED Program.

Proposed Science Program Stage 1 Actions

The CALFED Program will evaluate the following Science Program actions proposed for implementation in Stage 1. These proposed Stage 1 actions are representative of the overall set of proposed actions for the Science Program.

- Periodic review and refinement of the monitoring, data assessment and research plan from a long term perspective (yr 1-7).
- Periodic review and refinement of the monitoring, data assessment and research plan from a short term perspective which would include all elements of the Phase III, Stage 1 Program (yr 1-7).
- Help management define triggers and time periods which determine the need for a change in program direction (yr 1-7).
- Continue to develop and refine conceptual models to be used in evaluating actions undertaken by the programs. In keeping with the adaptive management format, the models will be continually updated with information generated by program actions (yr 1-7).
- Evaluate the effectiveness of the adaptive management process on the program decision making process (yr 1-7).
- Review the progress toward achieving overall CALFED Program goals and objectives and whether individual programs are progressing at similar paces (yr 1-7).
- Complete monitoring identified by the Diversion Effects on Fisheries Team to provide feedback on actual diversion effects of south Delta pumps (yr 2-7).
- Design long-term, system wide, baseline monitoring with focused research to increase understanding of ecological processes and ways to reduce uncertainty; definition of needed studies is currently under development (yr 1-7).
- Provide available data on need to reduce bromides, total dissolved solids, total organic carbon, pesticides and heavy metals (yr 5).
- Provide available data on water quality in the south Delta and lower San Joaquin River (yr 1-7).
- Monitor and assess the impacts of water use efficiency measures on water demands and available supplies, and develop better information for water balances in the Bay-Delta system (yr 1-7).
- Prepare annual reports on status and progress, including such information as: performance of habitat restoration actions compared to expected results, summaries of any new information on the relative importance of various stressors, and any need for adjustments in actions or conceptual models (yr 1-7).
- Analyze status and need for adjustments of actions for later stages (yr 5-7).
- Monitor and report land use changes, such as agricultural land conversion, resulting from CALFED Program actions (yr 2-7).
- Hire an interim science leader and subsequently hire a chief scientist (yr 1-2).
- Appoint an Independent Science Board and an independent science panel for the EWA (yr 1-2).
- Coordinate existing monitoring and scientific research programs (yr 1-7).
- Refine the set of ecological, operational, and other predictive models that will be used in the evaluation process (yr 1-2).

- Establish and refine performance measures and indicators for each of the program areas (yr 1-7).

Multi-Species Conservation Strategy

The MSCS serves as a biological assessment for the CALFED Program and describes the CALFED Program strategy for achieving compliance with the ESA, CESA, and NCCPA during implementation of the CALFED Program. As a biological assessment, it summarizes the CALFED Program and analyzes its effects on 244 listed, proposed, and candidate species, and species of concern. As a "conservation strategy" it outlines conservation goals for species that will be effected by the Program, and identifies strategies for achieving those goals and NCCPA and/or CESA and ESA compliance.

Conservation Goals and Prescriptions

The MSCS identifies conservation goals for 244 species as well as species prescriptions and conservation measures to achieve these goals. The CALFED Program has established a goal to recover 19 species, contribute to the recovery of 25 species, and maintain 200 species. A goal of "recovery" was established for those species whose recovery is dependent on restoration of the Delta and Suisun Bay/Marsh systems. Recovery is achieved when the decline of a species is arrested or reversed, threats to the species are neutralized, and the species long-term survival in nature is assured. Recovery is equivalent, at minimum, to the requirements for de-listing a species under ESA and CESA. The goal "contribute to recovery" was assigned to species for which CALFED Program actions affect only a limited portion of the species' range and/or CALFED Program actions have limited effects on the species. To achieve the goal of contributing to a species' recovery, the CALFED Agencies are expected to undertake some of the actions under its control and within its scope that are necessary to recover the species. The goal "maintain" was assigned to species expected to be minimally affected by CALFED Program actions. For this category, the CALFED Agencies will avoid, minimize, and compensate for any adverse effects to the species commensurate with the level of effect on the species. Actions may not actually contribute to the recovery of the "maintain" species; however, at a minimum, they will be expected to not contribute to the need to list a species or degrade the status of a listed species. The CALFED Agencies will also, to the extent practicable, improve habitat conditions for these species.

Specific prescriptions were developed to achieve the conservation goals described above for each species. The prescriptions incorporate the measures identified in State and Federal recovery plans, where available, other relevant information, and professional judgement. Prescriptions include measures to enhance habitats and species and are not directly linked to the CALFED Program's adverse impacts.

As the CALFED Program proceeds during the next 30 years, it is anticipated that California's landscapes could change significantly and that new information will be available through research and monitoring. Consequently, species goals and prescriptions will likely change through time through adaptive management, and as new recovery plans are finalized or updated.

Framework for Federal Endangered Species Act Compliance

The program will be continuously monitored to ensure that it is implemented as intended and the elements necessary for regulatory commitments, i.e., conditions as described in the Conservation Agreement are implemented. In the event that information from monitoring or any other source indicates that any of the Program elements necessary for regulatory commitments are not being met or will not be met, notification will be provided, by the agency which developed the information, to the affected Agencies, as appropriate. Upon notification, the affected agencies will meet promptly to identify and assess measures which can be taken to remedy any noncompliance or anticipated noncompliance with the conditions, and will immediately implement measures. If the Service determines that a situation of noncompliance exists and the affected agencies are unable to remedy noncompliance within a reasonable time period that the Service prescribes, not to exceed 60 days, the regulatory commitments will be suspended or terminated. Upon a determination of noncompliance, formal consultation will be reinitiated and the Service will issue a new or amended biological opinion with conditions prescribing alternative regulatory requirements. If the compliance with the conditions set out above is subsequently achieved, the initial regulatory commitments may be revised and reflected through new or amended programmatic biological opinions. Nothing described here will affect the Service form exercising our regulatory authority.

There are several issues that have been subject to interpretation in the 1995 delta smelt opinion relating to OCAP. These issues will need to be resolved pursuant to any reinitiation of section 7 consultation concerning the joint operations of the CVP and SWP should the EWA not be fully implemented. These issues include but may not be limited to 1) the amount of allowable exports during the San Joaquin River pulse flow in April-May, either under the VAMP or the WQCP Vernalis flow requirements, 2) The amount or extent of actions that must be taken at the "yellow light" stage of incidental take to avoid or minimize the direct and indirect effects of project operations and to avoid reaching "red light", 3) articulating the environmental baseline for which all subsequent section 7 consultations for actions that may affect delta smelt and Sacramento splittail will be evaluated against, and 4) other actions that may be deemed necessary at the time of reinitiation to provide the regulatory protection for delta smelt and Sacramento splittail.

The MSCS describes program-level strategies to achieve compliance with ESA, including strategies to address the indirect effects of the CALFED Program, and strategies for completing tiered consultations. The CALFED Program's compliance strategies will, in part, be developed and implemented as part of future CALFED Program projects tiered from this programmatic biological opinion.

Entities implementing CALFED Program actions which may effect listed species will develop ASIPs. ASIPs will be developed for individual CALFED Program actions or groups of actions when enough detailed information is available about the actions to analyze fully their impacts on species and habitats, and develop appropriate measures to avoid, minimize, and compensate for impacts. Development of ASIPs will be coordinated with the wildlife agencies so that the particular set of measures necessary to be implemented to achieve FESA compliance will be incorporated as part of the proposed ASIP. The particular set of measures included will likely be unique to each ASIP. The MSCS describes programmatic avoidance, minimization, and compensation measures to be incorporated into ASIPs. However, most ASIPs will also include additional measures not described in the MSCS, and possibly a set of ERP actions. For example, a levee improvement project in the Delta may include a particular set of MSCS avoidance, minimization, and compensation measures, additional measures unique to the proposed project, and ERP actions to restore wildlife habitat adjacent to or on the improved levee. ASIPs will be reviewed for compliance with the NCCPA, CESA, and ESA through the section 7 consultation process, or through the section 10 habitat conservation planning process.

Service Area Effects

Implementation of the CALFED Program's Preferred Program Alternative related to water supply reliability will be determined largely in an incremental fashion through an adaptive management process. Because of this, it is not possible to accurately estimate the scope of potential service area effects on species and habitats. Project-level or site-specific impacts may not be known until Phase III of the CALFED Program (implementation). Therefore, the CALFED Program strategy for addressing indirect effects includes identifying a short-term strategy based on critical species needs for recovery and restoration, and a long-term strategy for dealing with impacts that cannot be predicted when the biological opinions are issued. These strategies attempt to address these effects at the project level and at the program level. Success of these strategies rely on implementing all of the elements described below :

- Providing technical assistance and other support to entities preparing Habitat Conservation Plans (HCPs) or conservation programs addressing effects of land use changes in the service.
- Evaluating each future water supply reliability program or project during planning and including appropriate measures to address indirect effects in the ASIPs. This may include implementing the applicable conservation measures already in the MSCS to conserve species relative to service area effects or developing new measures.
- Developing or contributing to conservation programs to address the critical needs of species in CALFED Program service areas not already covered by conservation plans.

Governance Plan

The interim governance structure will be in place from the time of the Programmatic ROD until a long-term permanent structure is adopted through State and Federal legislation. For interim governance, CALFED Agencies propose adoption of the current CALFED Program structure being used during the planning stage, but adapted for implementation. The interim governance structure, including identification of how decisions will be made, will be set forth in a new Implementation MOU which the agencies will develop and execute by the time of the ROD. The current structure is made up of the Policy Group reporting to the Governor of California and the Secretary of the Interior, public advisory groups, the CALFED Program Executive Director and staff, and State and Federal agencies and teams. This structure, with additions and modifications, will serve to bridge the gap until a permanent commission is established.

Interim Program Management Responsibilities

The Levee System Integrity Program management will remain with DWR, DFG, and other existing agencies. The CALFED Program will continue to manage the ERP, in coordination with the appropriate agencies. The State and Federal fishery agencies (DFG, Service, NMFS) will manage the EWA assets, in coordination with the ERP and water project operations (Reclamation and DWR). CALFED Program will be assigned program management for the Watershed Program. The CALFED Program and appropriate agencies (such as Reclamation, EPA, DHS, DWR, and SWRCB) will manage the Drinking Water Quality Program. For the Water Transfer Program, CALFED Program will provide program direction, oversight, and coordination among CALFED Program areas and among agencies with jurisdiction over water transfers and use of project facilities. Agencies with jurisdiction over water transfers would retain authority to implement any changes in their own policies or procedures. DWR, Reclamation, and CALFED Program will manage the Water Use Efficiency Program. DWR, Reclamation, and CALFED Program will manage the Storage Program Element. The CALFED Program will manage the Conveyance Program element. The CALFED Program will manage the Science Program.

Milestones

Milestones are a list of ERP, MSCS, and Water Quality Program actions the CALFED Program will fully implement in Stage 1 to address covered species. Milestones are a subset of the ERP actions the fish and wildlife agencies expect will be implemented in Stage 1, to achieve the CALFED Program's conservation goals. The complete list of milestones appears in Appendix A, Table A-4.

The CALFED Program's objectives for ecosystem restoration are to improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support

sustainable populations of diverse plants and animal species. The ERP, MSCS, and WQP are the principal CALFED Program elements designed to meet these objectives. Implementation of the ERP will be informed by the Science Program, which will conduct pertinent research, and monitor and evaluate the implementation of ERP, MSCS, and WQP actions. The ERP, MSCS, WQP, and the Science Program are directly relevant and important for FESA, CESA and NCCPA compliance. To ensure that the ERP, MSCS, and WQP are implemented in a manner and to an extent sufficient to sustain programmatic FESA, CESA and NCCPA compliance for all CALFED Program elements, the USFWS, NMFS and DFG (the Fish and Wildlife Agencies") have developed Milestones for ERP, MSCS, and WQP implementation. The Milestones include Science Program actions that are relevant for ERP, MSCS, and WQP implementation. The Fish and Wildlife Agencies have concluded that the Milestones, if achieved along with expected additional ERP actions, define an adequate manner and level of ERP, MSCS, and WQP implementation for Stage 1.

The ERP, MSCS, and WQP are the CALFED Program's blueprint for the restoration of the Bay-Delta. The MSCS is not a separate blueprint or supplemental restoration program and does not supplant the ERP. The measures and goals in the MSCS are consistent with the ERP's measures and goals. However, the MSCS is a conservation strategy and a regulatory compliance strategy for the entire CALFED Program. The MSCS addresses the potential adverse effects and beneficial effects of all program actions, including ERP actions and other program actions such as levee system integrity actions, water conveyance actions and storage actions. Based in large part on the ERP, the MSCS' premise is that the CALFED Program as a whole, including all program elements, will improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta. The ERP therefore serves two purposes: 1) to achieve program objectives for ecosystem restoration and species recovery, and 2) to enable actions from all CALFED Program elements to be completed in compliance with FESA, CESA and the NCCPA through implementation of ASIPs.

To serve both of these purposes, ERP implementation must be informed both by the best available scientific information and by information about the implementation of other CALFED Program actions. Information about the implementation of other program actions is necessary to ensure that they do not conflict or limit the success of the ERP. In addition, ERP restoration actions must be implemented concurrent, and at a commensurate level, with the implementation of other program actions to ensure that the CALFED Program as a whole continues to increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta. The Milestones are intended to establish, based on the best information currently available, a group of actions derived from the ERP, MSCS, and WQP that 1) establish an adequate level of implementation during Stage 1, 2) would not be inhibited by proposed Stage 1 actions in other CALFED Program elements, and 3) would enable proposed Stage 1 actions in other CALFED Program elements to be completed in compliance with FESA, CESA and the NCCPA through implementation of ASIPs.

The CALFED Program's development of annual, near-term, and long-term ERP implementation priorities and strategies will be based on the goals and objectives of the ERP Strategic Plan, the MSCS, FESA recovery plans, and implementation plans developed for specific ecological management zones, and will be informed by the Science Program. The Milestones represent the MSCS' goals and objectives with respect to the ERP. As with ERP implementation priorities and strategies generally, the Fish and Wildlife Agencies intend that the Science Program will provide information concerning the Milestones. Specifically, the Fish and Wildlife Agencies will seek review within the Science Program of 1) whether other CALFED Program elements conflict with implementation priorities and strategies so as to limit the success of the ERP, MSCS, and WQP, and 2) whether the implementation priorities and strategies will ensure that the CALFED Program as a whole continues to increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta. As the Science Program develops information about implementation, the USFWS, NMFS and DFG will revise the Milestones as necessary, consistent with the FESA and NCCPA and/or CESA.

The CALFED Program will develop annual ERP implementation plans using the ERP Strategic Plan for Ecosystem Restoration and the MSCS. Members of the Science Program, the Agency/Stakeholder Ecosystem Team (ASET) the CALFED Program will work cooperatively to develop annual ERP implementation plans and to define the long-term priorities for the ERP. The Fish and Wildlife Agencies will participate fully in the process for developing annual ERP implementation plans. The Fish and Wildlife Agencies' participation will include, but not be limited to, participation in the ASET. Through participation in the annual ERP implementation plan process, the Fish and Wildlife Agencies will help ensure 1) that each plan is based on the best available information regarding ecosystem restoration and the Bay-Delta system, 2) that each plan will achieve substantial progress toward meeting the Milestones, and 3) that the Science Program will provide information to achieve applicable Milestones. As new information becomes available and conceptual models are tested and refined as part of this process, the Fish and Wildlife Agencies anticipate that priorities reflected in the Milestones may change, and that new issues or questions may emerge. Through the annual ERP implementation process, Science Program members, the CALFED Program, and ASET members may propose revisions to the Milestones based on pertinent new information. If the Fish and Wildlife Agencies determine that the proposed revisions are warranted and are consistent with FESA and the NCCPA and/or CESA, the Fish and Wildlife Agencies will revise the Milestones accordingly.

The Fish and Wildlife Agencies will not approve revisions to the Milestones that would cause or allow an effect to Covered Species or critical habitat designated under FESA that was not considered in the programmatic regulatory determinations, or would otherwise require the re-initiation of consultation under 50 CFR §402.16. Consequently, the USFWS and NMFS expect that their approved revisions to Milestones can be incorporated in each agency's programmatic

biological opinions without re-initiating consultation under §7 of FESA. DFG will incorporate its approved revisions to the Milestones by amending the DFG Approval and Supporting Findings for the MSCS.

It will not be possible to gauge the progress of Milestone implementation for a few years, once Phase III begins. Consequently, over the first four years the Wildlife Agencies will base success of CALFED Program Implementation upon the criterion that the ERP is fully funded. However, the criterion for success at the end of Stage 1 will be implementation of the Stage 1 Milestones.

The CALFED Program will submit an annual report to the Governor, the Secretary of the Interior, the State Legislature and the Congress that describes the status of implementation of all CALFED Program elements by December 15 of each calendar year. The report will document the status of all actions taken to meet CALFED Program objectives in Stage 1. Among the actions addressed in the report will be the completion of key projects and milestones identified in the ERP. Progress in achieving the ERP-MSCS Milestones will be included in the portion of the annual reports concerning the ERP.

Summary of Key Planned Actions

The following key actions are considered relevant to this biological opinion and part of the project description and, are therefore, requisite in conducting the effects analysis:

Program-wide

1. The conservation actions described in the Description of the Proposed Action will be implemented, including, but not limited to, the Ecosystem Restoration Program Plan, the Water Quality Program Plan, the Watershed Program Plan, and the Multi-Species Conservation Strategy and its strategy for addressing indirect, service area effects. These actions will be implemented consistent with the Science Program and adaptive management, as described in the **Description of the Proposed Action**.

2. CALFED Agencies will obtain funding sufficient to implement the conservation elements and strategies, as necessary, to implement this biological opinion.

3. The various CALFED Program elements, strategies, and projects will be implemented in concert with the ERP, MSCS, EWA, and WQP to achieve the multiple goals of the CALFED Program; and will be implemented such that the net effects to species and their habitats are positive and are consistent with recovery goals.

4. The CALFED Program will utilize comprehensive monitoring and adaptive management to assess projects and programs.

5. Projects and programs that are not in conformance with State and Federal recovery plans will be modified.

6. The CALFED Program will implement projects to achieve the milestones (Appendix A, Table A-4) established for the ERP, MSCS, and WQP.

7. Discharges into surface water bodies and waterways resulting from CALFED Program actions will comply with the standards set forth in the Description of the Proposed Action for the biological opinion on the Environmental Protection Agency's Promulgation of Numeric Criteria for Priority Toxic Pollutants for the State of California; California Toxics Rule (CTR) (Service File No. 1-1-98-F-21), in accordance with applicable implementation plans.

8. Entities implementing CALFED Program actions will comply with all applicable environmental laws.

9. Reclamation and DWR will consult on all new and modified water contracts within their discretion resulting from a CALFED Program action that may affect listed species, including changes from Agriculture to Agriculture/Municipal and Industrial uses.

Levee System Integrity Program

10. Levee integrity improvement elements will be consistent with ERP actions and MSCS conservation measures, so that levee integrity and ecosystem and species recovery advance simultaneously.

11. The Service, NMFS, and DFG will be involved in planning Levee System Integrity Program projects to ensure that ERP implementation is not impaired by levee program actions and adverse effects of levee actions are fully mitigated.

12. Development and implementation of CALFED Program plans for rehabilitating Suisun Marsh levees will be consistent with the goals of the ERP and MSCS, including State and Federal recovery plans.

13. Levee repair/improvements will be constructed using levee set-backs and soft-fixes (bio-technical solutions) to the extent practicable.

Water Quality Program

14. The CALFED Program will implement projects to achieve the milestones established for the WQP in Stage 1. In the event the milestones are not achieved during Stage 1, the CALFED agencies will reinitiate consultation with the wildlife agencies.

Ecosystem Restoration Program

15. The CALFED Program will implement projects to achieve the milestones established for the ERP in Stage 1. In the event the milestones are not achieved during Stage 1, the CALFED agencies will reinitiate consultation with the fish and wildlife agencies.

16. The ERP will be implemented in a manner that will achieve species prescriptions and recovery goals of covered species by year 30 of the CALFED Program. Stage 1 milestones establish the trajectory for achieving recovery goals for the first 7 years.

Water Use Efficiency Program

17. Development and implementation of the WUE will be consistent with the goals and objectives of the ERP and MSCS, including State and Federal recovery plans. Program actions will be planned in conjunction with the Service, NMFS, and DFG, in compliance with FESA, CESA, and NCCPA, as appropriate. Program development will be coordinated with other CALFED Programs (WQP, ERP, MSCS, and Science Program). Program actions will be funded so that it is assured that appropriate conservation measures for listed species will be included in program actions.

Water Transfers Program

18. No water transfers resulting from CALFED actions will occur if it would result in adverse effects on fish and wildlife until consultation under section 7 and NCCPA and/or CESA is completed. Reclamation and DWR will consult on all proposed 3rd party water transfers that may affect listed species and their native habitats. Additionally, the EWA will not be charged for curtailed 3rd party transfer opportunities.

19. EWA and Level 4 Refuge water supply transfers will have priority for conveyance over other transfer obligations.

20. In all instances in which a water transfer resulting from a CALFED action may affect listed species and their habitats, the fish and wildlife agencies will determine whether adverse impacts are likely to occur.

Watershed Program

21. Development and implementation of the Watershed Program will be consistent with the goals of the ERP and MSCS, including State and Federal recovery plans. Program actions will be planned in conjunction with the Service, NMFS, and DFG, in compliance with FESA, CESA, and NCCPA,

as appropriate. Program development will be coordinated with other CALFED Programs (WQP, ERP, MSCS, and Science Program). Program actions will be funded so that it is assured that appropriate conservation measures for listed species will be included in program actions.

Water Management Strategy

Specific key actions are provided for storage, conveyance, EWA, and other programs.

Storage

22. Storage sites will be selected through a screening process which includes applicable environmental requirements.

23. CALFED agencies will comply with section 7(d) of the ESA, which prohibits making any irreversible or irretrievable commitment of resources, for any potential new storage site or modified storage site prior to achieving project-specific compliance under section 7(a)(2) of the ESA. Additionally, CALFED agencies will acknowledge, research, analyze, and provide information on growth-inducing impacts to the Service on all storage projects as well as other indirect effects.

24. Tiered project specific analyses of potential storage improvements will identify and result in the selection of alternatives that are capable of being mitigated with appropriate mitigation sites and operational requirements; where the compensatory mitigation is highly likely to be successful; with the project specific compensatory mitigation implemented concurrent with, or in advance of, the adverse effects associated with construction and implementation of the project; where construction and operation of the project will not result in jeopardy to listed or proposed species or adverse modification of critical habitat; and where the project will not result in substantial degradation of the aquatic environment.

25. Any and all conveyance structures (e.g., canals, pipelines), recreation, roads, and similar developments associated with or proposed in conjunction with proposed expansions of existing storage facilities or proposed new storage facilities will be evaluated thoroughly for their impacts to Federal or State listed species and those species evaluated under the MSCS. If, through the informal or formal consultation process, it is determined by the Service, NMFS, and DFG (for State listed species) that project-related impacts would threaten the long-term viability of Federal or State listed species or those species evaluated under the MSCS, the proposed project(s) will be modified or dropped from consideration.

Conveyance

26. Consistent with the Service's regulatory authority, no water developed by any CALFED agency

from a CALFED Program element will be delivered or applied outside current contract service areas, if listed species may be affected, until either formal or informal consultation is complete. In some cases, deliveries in excess of the average historical delivery amounts to water districts may result in changes in land-use practices in the districts and trigger the need for informal consultation between the CALFED agencies and the Service. Once formal project-specific consultation has occurred that is in compliance with this opinion, it is assumed that changes in land-use practices, and impacts to listed and proposed species, in the district have been addressed.

27. In proceeding with the South Delta Improvement Program, CALFED agencies shall implement ecosystem restoration in the lower San Joaquin river and south Delta (generally, south of Empire Cut) in advance of or concurrent with impacts resulting from south Delta facility improvements.

28. In instances where landowners in the south Delta directly benefit from CALFED Program actions, CALFED Agencies will secure written agreements from the land owners to allow access for screening of agricultural and municipal diversions to protect fish consistent with the screening priorities established by the CALFED Program. If monitoring is necessary, access for monitoring will be allowed with reasonable notification. When the DFG, NMFS and Service, in consultation with the CALFED Agencies, determine that a diversion requires screening, the landowner will allow the diversion to be screened in accordance with the aforementioned agreement. If the CALFED Program is not substantially achieving screening program objectives, the CALFED Agencies will reinitiate informal or formal consultation.

29. When implementing EWA export reductions, the water cost associated with decreased exports will be charged against current facilities capabilities as constrained by current regulation. Any future increases in exports resulting from CALFED conveyance improvements will have operational rules developed through consultation with the fish and wildlife agencies to ensure consistency with EWA Operating Principles, and the goals of restoration and recovery for aquatic species.

30. In the interim prior to installation of permanent operable barriers, DWR will apply for and obtain permits to allow the continued operation of the temporary barriers.

31. Prior to increasing pumping above current authorized levels, operational rules for use of additional export capability will be determined through ESA and NCCPA and/or CESA consultation on the project-specific environmental documentation prepared for the various conveyance elements. To offset potential impacts and to provide for recovery of fishery populations, additional measures will be developed which would allow for protection of fish. These additional measures may include, but are not limited to: (a) screening, (b) new standards which limit the timing and magnitude of exports and water supply releases at key periods of fish concern, or (c) a combination of the two. ESA and NCCPA and/or CESA coverage for such actions would come from separate consultation for OCAP or in consultations tiered from this approval.

32. An isolated conveyance facility will be evaluated as an alternative in the event it is determined that a through-Delta system will not accomplish the CALFED Program's goals for restoration and recovery of listed species, or its WQP goals. The study will be developed through a peer-review process to ensure objective analysis.

EWA

33. All EWA fixed assets (i.e. purchases) are acquired each year.

34. The EWA Operational Principles Agreement is signed and fully implemented.

35. The project agencies shall request clarification with the Service, DFG and NMFS on any points that appear to be ambiguous related to fishery actions for the EWA.

36. If EWA assets are depleted and the Service, NMFS, and DFG determine Tier 3 is necessary, Tier 3 assets will be available to protect fish.

37. As new water storage and conveyance projects are being planned, potential fishery impacts will be assessed. To offset potential impacts and to provide for recovery of fishery populations, additional operational rules will be developed which would allow for protection of fish. These operational rules may include but not limited to (a) limits on the timing and magnitude of exports and water supply releases at key periods of fish concern, and (b) new sharing formulae to increase EWA assets, which would allow the EWA to offset impacts and implement restoration actions. ESA coverage for such actions would come from separate consultation for OCAP or in consultations tiered from this opinion, as appropriate.

Science Program

38. The Science Program will complete annual reports describing program progress and compliance of all CALFED program actions within this NCCPA Approval and biological opinions.

Multi-Species Conservation Strategy

39. CALFED agencies will consult with the DFG and the Service or request technical assistance, as appropriate, to determine whether any future CALFED Program actions (including water transfers and permanent assignments of water) may affect listed or proposed species before signing a ROD or a FONSI which is tiered from the Programmatic EIS.

40. The list of evaluated species will be reviewed and revised periodically by the Service, NMFS, and DFG to add and remove species, as appropriate, and to review the recovery objective (R, r, or m) for species for their appropriateness.

41. The Service will work closely with other CALFED agencies, water users and others, providing them with maps of listed species habitats within service areas. The Service will guide entities through the consultation process or provide technical assistance, as appropriate, to address project-specific effects.

42. Entities implementing CALFED Program actions will complete tiered, project-specific consultation with the Service, NMFS, and DFG, as appropriate, through completion of Action-Specific Implementation Plans, as described in the MSCS.

43. The CALFED agencies will closely coordinate with the Service, NMFS, and DFG during development and implementation of all Action-Specific Implementation Plans.

44. The strategy for addressing service-area effects described in the MSCS will be implemented prior to districts or areas receiving improved water supplies or reliability resulting from CALFED actions if the analysis has determined that there will be effects. The strategy may include tools such as: (1) assisting with or contributing to completion and implementation of HCPs that address service area effects, as described in section 10(a) of the FESA; (2) including measures to address indirect effects in ASIPs and completing project-specific section 7 consultations on the ASIPs; (3) contributing towards or developing and implementing a conservation program that addresses species critical needs; and implementing the applicable conservation measures, relative to service-area impacts, already in the MSCS.

45. The CALFED Program will monitor the baselines of the species addressed in this opinion. Monitoring (for the life of the CALFED Program's Preferred Program Alternative) will be implemented immediately to test and track the CALFED Program's objective that species' baseline are stable or increasing.

46. Any project-specific effects to listed species will be consulted upon following project-specific analysis and prior to the effect, and the CALFED agencies shall be adequately funded and staffed to complete tiered project-specific consultations from this opinion and track implementation of conservation actions.

III. Approval of MSCS and Supporting Findings

All NCCPs must contain certain substantive elements identified in the NCCP Act. And DFG must ensure that its approval of the MSCS is consistent with its responsibilities as a State agency under CESA. These findings explain and substantiate this NCCP Program Approval in accordance with CESA and the NCCPA. In addition, these findings present DFG's conclusions regarding the MSCS's consistency with DFG's non-regulatory, general process guidelines for NCCPs.

A. The NCCP Act

In addressing the scope and purpose of NCCP, the NCCP Act identifies the following essential NCCP elements:

1. An NCCP must regional or area-wide in scope (§2805(a).)

The geographic scope of CALFED includes two distinct areas, the "Problem Area" and the "Solution Area". The Problem Area is defined as the legal Delta and Suisun Bay and Marsh. The Solution Area is much broader in extent than the Problem Area; it encompasses the Central Valley watershed, the upper Trinity River watershed, the southern California water system service area, San Pablo Bay, San Francisco Bay, portions of the Pacific Ocean out to the Farallon Islands, and a near-shore coastal zone that extends from about Morro Bay to the Oregon border.

As described above, the **MSCS Focus Area** includes the legally defined Delta, Suisun Bay and Marsh, the Sacramento and San Joaquin Rivers and their tributaries downstream of major dams, and the potential locations of reservoirs. The MSCS clearly addresses the protection and conservation of wildlife on broad, geographic scale.

DFG hereby finds the MSCS addresses wildlife conservation on an regional or area-wide scale, as required by Fish and Game Code Section 2805(a).

2. An NCCP must protect and perpetuate natural wildlife diversity (§2805(a).)

The MSCS provides comprehensive management and conservation of multiple wildlife species including, but not limited to, those species listed pursuant to the CESA. The MSCS and ERP have been developed to conserve twenty (20) natural communities and the species that depend on them. The MSCS contains conservation measures to enhance NCCP communities and evaluated species. The majority of measures designed to enhance NCCP communities and evaluated species incorporate and refine existing, ERP and other CALFED actions. NCCP habitat conservation measures are primarily aimed at conserving the quality and quantity of natural habitats. These enhancement conservation measures add additional detail to CALFED programmatic actions that would help achieve species prescriptions and recovery goals (MSCS Attachment E, Tables E-1 to E-3). Conservation measures to avoid, minimize, and compensate for adverse effects to NCCP communities and evaluated species caused by individual program actions are also described in Attachment E. These measures would be incorporated early in site-specific project development and would be specific components of a project to offset any adverse effects.

The ERP is the principal program element designed to improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plants and animal species. The ERP contains over 600 programmatic actions throughout the Bay-Delta watershed aimed at the restoration of ecological processes; the protection, enhancement and restoration of functional habitats; the recovery and enhancement of species, species groups, and biotic communities; and the reduction of stressors (ERP, Volume II).

Comprehensive monitoring and assessment of program actions will provide the means to evaluate the CALFED Program's progress towards achieving ecosystem restoration goals and objectives and progress towards meeting prescriptions for NCCP communities and covered species. The CALFED Program will use the adaptive management process to monitor the Bay-Delta ecosystem, carry out management strategies, and conduct additional research. As the CALFED Program receives new information about the Bay-Delta ecosystem, CALFED will be able to determine whether its management prescriptions—including the MSCS conservation measures—are meeting its goals and objectives. CALFED will then have an opportunity to refine those management prescriptions as needed. Clearly, the CALFED Program will substantially protect and benefit species populations, habitats, and natural communities.

DFG hereby finds the MSCS substantially protects and perpetuates natural wildlife diversity, as required by Fish and Game Code Section 2805(a).

3. <u>An NCCP must allow compatible and appropriate development and growth (§2805(a).)</u>

CALFED and the MSCS have been developed against a backdrop of existing and ongoing Federal, State, and local efforts intended to conserve listed and other sensitive species within the MSCS Focus Area. CALFED will be consistent and synergistic with existing wildlife protection and recovery programs (MSCS Chapter 5). CALFED agencies that will implement CALFED actions have entered into a conservation agreement thereby agreeing to adhere to the MSCS when implementing CALFED actions. In addition, the MSCS provides the framework for making commitments to cooperating landowners that they will not be prevented from continuing their existing land uses because of the implementation of CALFED actions or MSCS conservation measures. Entities implementing CALFED actions will comply with FESA, CESA, and NCCPA through a simplified compliance process that tiers from the programmatic consultations. As described in Chapter 6 of the MSCS and in the Conservation Agreement, the MSCS accommodates compatible development and growth activities by creating a simplified permitting process.

DFG hereby finds that the MSCS allows compatible and appropriate development and growth, as required by Fish and Game Code Section 2805(a).

4. Must be consistent with planning agreements entered into for the purpose of preparing and implementing an NCCP (§2820)

Under Fish and Game Code Section 2810, DFG is authorized, but not required, to enter into planning agreements with any person for the purpose of preparing and implementing a natural community conservation plan to provide for comprehensive management and conservation of multiple wildlife species. A planning agreement identifies the scope of the plan to be prepared and the participating parties. Section 2820 of the Fish and Game Code states that NCCPs must be consistent with planning agreements as specified in Section 2810.

For the purposes of the MSCS, DFG has not entered into a planning agreement. However, the MSCS was prepared in accordance with the DFG's non-regulatory, general NCCP process guidelines (effective January 22, 1998) for planning agreements. Because DFG has not entered into a planning agreement for the MSCS, Fish and Game Code Sections 2810 and 2820 do not apply.

5. Provides for the conservation and management of species subject to take (§2835).

The MSCS provides for the conservation and management of all species for which the DFG may issue take authorization, as described in the ASIP process (MSCS Chapter 6). USFWS, NMFS, and DFG can authorize the incidental take of covered species under FESA, CESA and NCCPA based on the MSCS and ASIPs submitted by the proponents of specific CALFED actions.

USFWS and NMFS will evaluate each ASIP pursuant to Section 7 and/or Section 10(a) of FESA. The resulting action specific analysis for the evaluated species will be predicated on the programmatic biological opinions for CALFED. The action specific analysis will evaluate each ASIP to determine whether the ASIP, in conjunction with the MSCS, complies with Section 7 and/or Section 10(a) of FESA. If an ASIP meets Section 7 and/or Section 10(a) requirements, the incidental take of Federally covered species may be authorized.

DFG will evaluate each ASIP to determine whether the ASIP, in conjunction with the MSCS, meets the requirements of NCCPA. If an ASIP meets NCCPA requirements, DFG will provide to the proponent of the specific CALFED action(s) an NCCPA take authorization for State-covered species. If the CALFED action addressed in the ASIP may affect State-listed species that are not State-covered species, DFG will also determine whether the ASIP meets the requirements of Section 2081(b) of CESA and can authorize incidental take of such species accordingly.

Species that are extremely rare or limited in distribution may be included as State-covered

or Federally covered species. The MSCS specifies that mortality of such species that could be caused by CALFED actions must be avoided (see MSCS Table 4-5 for a list of these species). However, it is possible that some limited types of take (e.g., harassment) can be authorized to ensure that entities implementing CALFED actions are in compliance with FESA and CESA.

The take of other species must be avoided because of laws prohibiting DFG from authorizing the take of such species (California Fish and Game Code §3505, §3511, §4700, §5050, and §5515.) DFG has determined that implementation of the MSCS pursuant to the Conservation Agreement will not result in the death of individuals of the following species which are fully protected species or specified birds by the State of California: ring-tailed cat (*Bassariscus astutus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), California black rail (*Laterallus jamaicensis coturniculus*), California clapper rail (*Rallus longirostris obsoletus*), greater sandhill crane (*Grus canadensis tabida*), little willow flycatcher (*Empidonax traillii brewsteri*), white-tailed kite (*Elanus leucurus*), great egret (*Ardea albus*), snowy egret (*Egretta thula*), and osprey (*Pandion haliaetus*). This NCCP Approval is therefor not contrary to §3505, §3511, §4700, §5050, and §5515.

The DFG hereby finds that the MSCS provides for the conservation and management of all species that may be subject to take authorization as described in the ASIP process, as required by Fish and Game Code Section 2835.

B. NCCP Guidelines

NCCP Process Guidelines, adopted pursuant to §2835 of the Fish and Game Code for the general application of the NCCP Act, are designed to help planners provide for the regional protections of and perpetuation of biological diversity, meet NCCP regulatory requirements and to allow for flexibility in plan development. The NCCP Process Guidelines are nonregulatory and are not rigid, mandatory criteria for DFG approval. However, the MSCS substantially adheres to the Process Guidelines.

1. Scope. Natural communities, geographic area of plan and conservation goals for the plan area.

As described above, the MSCS Focus Area spans a broad geographic area which includes the legally defined Delta, Suisun Bay and Marsh, the Sacramento and San Joaquin Rivers and their tributaries downstream of major dams, and the potential locations of conveyance and water storage facilities (MSCS Section 1.8.1). The MSCS defines 20 NCCP communities (Sections 2.1-2.2), comprised of 18 habitats and two ecologically based fish groups, and defines goals and prescriptions for these communities (MSCS Table 3-2). The MSCS clearly addresses the protection and conservation of wildlife on broad, geographic scale.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to defining the natural communities, geographic area of the plan and conservation goals for the plan area.

2. <u>Covered Species</u>. Species to be conserved and managed within the plan area, subject to take authorization, and ecological needs of species addressed by plan.

The MSCS defines species goals and prescriptions for reaching these goals in Section 3.3 and Table 3-1 of the MSCS. The criteria used to select the species evaluated in the MSCS is described in Table 2-2. Species goals, State and Federal status, and potential effects of CALFED actions on evaluated species and FESA designated critical habitats are included in Table 2-2. The process for identifying a list of covered species from the list of evaluated species is described in Section 2.4 of the MSCS. The process for obtaining incidental take authorization for covered species, using the ASIP process, and modifications to the covered species list are described in Section 6.2 of the MSCS. Information on the ecological needs of evaluated species was gathered for the MSCS and includes historic and current status and distribution of species in the CALFED Program Solution Area; species life history and habitat requirements; reasons for decline of species and designated critical habitats and recovery plan requirements of listed species. The MSCS clearly describes a strategy for conserving, managing, and providing for the ecological requirements of species in the MSCS Focus Area and a process (ASIPs) for obtaining take authorization for program actions.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to defining the species to be conserved and managed within the plan area; identifying species that will be evaluated for coverage under NCCP and may be subject to take authorization under the ASIP process, and in describing the ecological needs of species addressed by plan.

3. <u>Anticipated activities</u>. Activities or categories of activities anticipated to be authorized by plan participants.

The Project Description contained in this NCCP Approval provides a description of anticipated program actions. Covered activities include actions addressed in the Final Programmatic EIS/EIR. The MSCS (Chapter 3) summarizes these activities and the Project Description herein identifies program activities and priorities important for the NCCP Approval.

The MSCS (Chapter 4) describes the methodology used to evaluate the impact of program actions on NCCP communities and evaluated species. Attachment B contains a list of proposed CALFED actions analyzed in the MSCS and Attachment D contains a summary of the potential beneficial and adverse CALFED effects to NCCP communities and conservation measures

incorporated into the CALFED Program to avoid , minimize, and compensate for adverse effects. DFG has considered all proposed CALFED actions, as described in the Final Programmatic EIS/EIR, that would benefit or harm the MSCS's NCCP communities and evaluated species, including all ERP actions, for purposes of determining whether CALFED complies with CESA and NCCPA.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to describing the activities or categories of activities anticipated to be authorized by plan participants.

4. <u>Principles of Conservation Biology.</u> Scientifically sound principles of conservation biology used to formulate the plan.

The ERP is the principal CALFED Program component designed to restore the ecological health of the Bay-Delta ecosystem. The approach of the ERP is to restore or mimic the ecological processes and to increase and improve aquatic and terrestrial habitats to support stable, self-sustaining populations of diverse and valuable species. The Strategic Plan describes:

- an Ecosystem-based management approach
- an adaptive management process
- the value and application of conceptual models
- decision rules and criteria for selecting and prioritizing restoration actions
- goals, objectives and rationale for ecosystem restoration
- critical issues that need to be addressed early in the restoration program
- opportunities for restoration
- guiding principles for implementing the ERP
- institutional and administrative considerations necessary to adaptive management

The MSCS and ERP address a broad range of species and habitat types throughout a large area, and encompass numerous large-scale, long-term actions. In preparing the MSCS and ERP, the CALFED Program has used the best available scientific information and collected input from a broad array of experts. During the development of the ERP, CALFED has convened panels of nationally-recognized, independent scientists to provide objective review and input to the ERP. Independent scientists and agency biologists were convened in technical workshops to provide recommendations for species goals and prescriptions and conservation measures for MSCS evaluated species. The ERP and MSCS have clearly been developed using sound scientific principles of conservation biology.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to describing scientifically sound principles of conservation biology used to formulate the plan.

5. Conservation Strategy. Conservation measures, compatible uses, schedule for implementation, and measurable goals.

Conservation measures- The MSCS contains conservation measures to avoid, minimize, and compensate for adverse effects on NCCP communities and evaluated species caused by individual CALFED actions; and measures to enhance NCCP communities and evaluated species that are not linked to the direct adverse effects of individual CALFED actions (MSCS Attachments D and E).

Compatible uses- The MSCS allows compatible uses by providing a simplified permitting process for both CALFED actions and non-CALFED actions (MSCS Chapter 6). Each implementing entity will include appropriate cooperating landowner protection measures and a plan for providing them in the ASIP prepared for the CALFED action to be implemented. Based on these measures, USFWS, NMFS, and DFG can authorize limited incidental take by cooperating landowners as necessary or appropriate to protect compatible existing uses of land and water that could be affected by the CALFED action or associated conservation measures.

Milestones or schedule for implementation- As described in the Project Description, to ensure that the ERP is implemented in a manner and to an extent sufficient to sustain programmatic FESA, CESA and NCCPA compliance for all CALFED Program elements, the USFWS, NMFS and DFG have developed milestones for ERP implementation (the "MSCS-ERP Milestones", Appendix A, Table A-4). The MSCS-ERP Milestones include Science Program actions that are relevant for ERP implementation. DFG, USFWS, and NMFS have concluded that the MSCS-ERP Milestones, if achieved substantially as specified in the Agencies' programmatic regulatory determinations, define an adequate manner and level of ERP implementation for Stage 1.

The MSCS-ERP Milestones are intended to establish, based on the best information currently available, a group of actions derived from the Ecosystem Restoration Program Plan that 1) establish an adequate level of ERP implementation during Stage 1, 2) would not be inhibited by proposed Stage 1 actions in other CALFED Program elements, and 3) would enable proposed Stage 1 actions in other CALFED Program elements to be completed in compliance with FESA, CESA and the NCCPA.

Measurable goals- The MSCS (Section 3.3; Table 3-1; Attachment E) describes species goals and prescriptions for reaching species goals for all evaluated species. Goals for NCCP communities and prescriptions for reaching NCCP goals are also described in the MSCS (Sections 3.3; Table 3-2). The MSCS-ERP milestones, described in the previous section, also provide measurable goals which will be used to assess progress in implementing the ERP.

The Strategic Plan contains strategic goals and objectives of the ERP that address 1) recovery of endangered and other at-risk species and native biotic communities; 2) rehabilitation of natural ecological processes; 3) maintenance and enhancement of selected commercial and recreational harvest species; 4) protection and restoration of functional habitats; 5) reduction of non-native species, and 6) improvements in water and sediment quality.

In summary, the MSCS clearly describes conservation measures and measurable goals for NCCP communities and species. The Strategic Plan articulates recovery of at-risk native species and the protection of functional habitats and native biotic communities as primary goals of the implementation strategy. The MSCS clearly describes a simplified permitting process (ASIP process) that allows for compatible development to occur. The ERP-MSCS Milestones establish an adequate level of ERP implementation during Stage 1 that will allow other CALFED Program elements to be completed in compliance with FESA, CESA and the NCCPA.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to describing conservation measures, compatible uses, schedule for implementation, and measurable goals.

6. <u>Monitoring.</u> Monitoring program to ensure compliance with implementation, biological performance, and achievement of management goals and objectives.

The MSCS (Chapter 7) describes the manner in which CALFED will measure progress towards meeting prescriptions for NCCP communities and MSCS evaluated species primarily by monitoring the distribution and abundance of habitat types over time. The CMARP Plan (July 2000) describes an initial concept and framework for a monitoring and research program to implement, assess, and improve the ERP through adaptive management. The plan includes monitoring of physical processes that may change in response to CALFED actions, such as river flow below dams that can affect fluvial geomorphological processes. The plan includes monitoring of habitats affected by those processes such as channel form and riparian vegetation. The plan also includes monitoring of those species dependent on those habitats. The final ERP monitoring program will be designed to fulfill the monitoring and assessment needs of the MSCS.

Monitoring serves not only to ensure compliance and gauge the effectiveness of CALFED actions, but also makes CALFED's choices under the adaptive management process more apparent, helps CALFED to redefine biological goals, and assesses the status of species and habitat conditions. To ensure proper implementation of the MSCS, CALFED must monitor its success in attaining its NCCP community and evaluated species prescriptions. CALFED also must monitor its compliance with MSCS measures that are required for FESA and CESA compliance and specified in any subsequent Section 7 consultation, Section 10(a)(1)(B) permit, or NCCPA and/or Section 2081 authorization.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to describing a monitoring program to ensure compliance with implementation, biological performance, and achievement of management goals and objectives.

7. <u>Adaptive Management.</u> Flexible, iterative approach to long-term management of natural communities, habitat types, and species within the plan area.

As described in the Introduction, the CALFED Program includes provisions for applying an adaptive management process, which is an overarching principle of the Science Program. The Strategic Plan describes, in detail, the adaptive management process that will be employed to implement the ERP (Strategic Plan, Chapter 3). The adaptive management components of the MSCS are described in Chapter 7 and Chapter 8 of the MSCS. The CALFED Program will periodically evaluate the effectiveness of the conservation measures for NCCP communities and evaluated species and modify these measures when necessary. The CALFED Program's strategic approach for implementation includes staged implementation and staged decision making (Implementation Plan, Chapter 1). Throughout the implementation period, monitoring will provide information about overall conditions in the Bay-Delta and on the status and trends of natural communities. Clearly, adaptive management is emphasized throughout the CALFED Program as the process by which program implementation will occur.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to describing a flexible, iterative approach to long-term management of natural communities, habitat types, and species within the plan area.

8. <u>Funding.</u> Funding sources to ensure conservation actions identified in the plan are implemented according to the schedule and goals set forth in the plan.

Funding to implement the MSCS and ERP will be part of the overall funding package for the CALFED Program (Phase II Report, Chapter 5). In Stage 1, the CALFED Program plans to invest over $1 billion in ERP projects, in accordance with the priorities established in the Strategic Plan, in addition to funds necessary for the Environmental Water Account (EWA). An additional $50 million will be required annually for the EWA for the first four years. It is anticipated that additional funding to support the EWA will be needed beyond the first four years. The level of assets required to support the continuation of the EWA beyond the first four years will be evaluated, as described in the ROD. The CALFED Program proposes to fund the ERP using a combination of State funding (including Proposition 204 funds), Federal funding, and user fees, with a minimum of $50 million a year to be provided by each source. By the end of Stage 1, the CALFED Program will reevaluate the level of dedicated annual funding from State, Federal, and user sources to achieve the ERP goals.

Clearly, there is a substantial commitment to fund program actions, as described in the Phase II report, Conservation Agreement and ROD.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to describing a funding source to implement the various provisions of the CALFED Program.

9. Assurances. Assurances that provide for the long-term reconciliation of new land development in the planning area and the conservation and protection of endangered species.

Based on CALFED's progress in achieving its ecosystem objectives, USFWS, NMFS, and DFG will provide appropriate commitments regarding CALFED action(s) directly to the agency or other entity carrying out the action. The commitments will be based on the ASIP developed for the CALFED action in the MSCS's simplified permitting process. To the extent permitted by law, they will limit new or different conservation measures that would require additional commitments of land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources, beyond what is required in the ASIP. The specific scope and duration of USFWS's, NMFS's, and DFG's commitments will vary depending on the scope and duration of each CALFED action's impacts on covered species and whether the impacts will recur or continue over an extended period of time.

In addition, the MSCS provides the framework for making commitments to cooperating landowners that they will not be prevented from continuing their existing land uses because of the implementation of CALFED actions or MSCS conservation measures. Many landowners may be concerned that if the populations of threatened and endangered species increase within the Focus Area, FESA and CESA will restrict the use of land or water in or near the species habitat. Cooperating landowner programs are intended to address this concern and to preserve compatible land uses within the Focus Area.

DFG hereby finds that the MSCS substantially adheres to the Process Guidelines with respect to describing how assurances will be provided for the long-term reconciliation of new land development in the planning area and the conservation and protection of endangered species.

C. CESA

CESA states,

"The Legislature further finds and declares that it is the policy of the state that state

agencies should not approve projects as proposed which would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy.

Furthermore, it is the policy of this state and the intent of the Legislature that reasonable and prudent alternatives shall be developed by the department, together with the project proponent and the state lead agency, consistent with conserving the species, while at the same time maintaining the project purpose to the greatest extent possible. (§2053)."

CESA also requires that all State agencies, boards, and commissions shall seek to conserve endangered species and threatened species and shall utilize their authority in furtherance of the purposes of CESA (§2055). DFG must ensure that its approval of the MSCS does not conflict with this responsibility.

DFG hereby finds that the MSCS , if properly implemented, will not jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species. DFG further finds that the MSCS will assist in the conservation of endangered species, threatened species and other species of concern.

III. DFG Approval

Based on the foregoing analysis and findings, DFG finds,

- that the MSCS meets all necessary requirements for a natural community conservation plan;
- that the MSCS prescribes a mitigation strategy under which each project covered by the MSCS will be required to provide mitigation or conservation that is proportional to the project's expected impacts to covered species; and
- that the mitigation strategy described in the MSCS evidences a clear nexus between mitigation required for projects covered by the MSCS and projects' expected impacts to covered species.

Based on these findings, pursuant to §2820, DFG hereby approves the MSCS for the CALFED Program.

IV. Scope and Duration of NCCPA Program Approval

A. Covered Species

1. Covered species list

The potential impacts to evaluated species and the rationale for including or excluding species as covered species under the NCCP is described in Table A-1 (Appendix A). Potential beneficial effects of proposed ERP actions was determined, based in part, on the ERP targets for habitat protection, enhancement, and restoration described in Table A-2 (Appendix A). The list of NCCP covered species is included in Table A-3 (Appendix A).

2. Additions of new species to the list of Covered Species

If a species that is not a covered species, but that is known to occur or has the potential to occur in the Focus Area, is proposed for listing pursuant to FESA or CESA, then USFWS, NMFS, and DFG will determine whether additional conservation measures beyond those described in the MSCS are necessary to comply with FESA and NCCPA. If additional measures are not necessary, the species will be added to the DFG covered species list, and take of such species may be authorized with other covered species pursuant to ASIPs approved by USFWS, NMFS, and DFG.

If additional measures are necessary, USFWS, NMFS, and DFG will work with CALFED and entities implementing CALFED actions to identify and implement the necessary measures. If USFWS, NMFS, and DFG determine that additional measures are necessary, they shall give preference where possible to measures that do not increase restrictions on the use of land or water. Once the additional measures are identified, they will be incorporated into the MSCS and the new species will be added to the DFG covered species lists. Take of the species may thereafter be authorized pursuant to ASIPs approved by USFWS, NMFS, and DFG.

If it is not practicable to revise the MSCS to allow for the addition of the species, USFWS, NMFS, and DFG, during review of the ASIPs, will determine the additional measures necessary to avoid, minimize, and compensate for impacts on the species. In such cases, in addition to determining whether the ASIP implements the MSCS with respect to the covered species, USFWS, NMFS, and DFG will determine whether the ASIP adequately addresses the impacts on the new species. If USFWS, NMFS, and DFG determine that additional measures are necessary, they shall give preference where possible to measures that do not require further restrictions on the use of land or water. The additional measures may be identified by USFWS, NMFS, and DFG at or after the time the species is proposed for listing.

B. Process for obtaining incidental take authorization

1. Action-Specific Implementation Plans

As described above, the MSCS provides for the conservation and management of all species for which the DFG may issue take authorization, as described in the ASIP process (MSCS Chapter 6). USFWS, NMFS, and DFG can authorize the incidental take of covered species under FESA, CESA and NCCPA based on the MSCS and ASIPs submitted by the proponents of specific CALFED actions. To fulfill the requirements of FESA Sections 7 and 10 and California Fish and Game Code Sections 2835 and 2081, as applicable, each ASIP must adhere to the following outline:

- a detailed project description of the CALFED action or group of actions to be implemented, including site-specific and operational information;
- a list of evaluated species and any other special-status species that occur in the action area;
- an analysis identifying the direct, indirect, and cumulative impacts on the evaluated species, other special-status species occurring in the action area (along with an analysis of impacts on any designated critical habitat) likely to result from the proposed CALFED action or group of actions, as well as actions related to and dependent on the proposed action;
- measures the implementing entity will undertake to avoid, minimize, and compensate for such impacts and, as appropriate, measures to enhance the condition of NCCP communities and evaluated species, along with a discussion of: 1) a plan to monitor the impacts and the implementation and effectiveness of these measures; 2) the funding that will be made available to undertake the measures, and 3) the procedures to address changed circumstances;
- measures the implementing entity will undertake to provide commitments to cooperating landowners, consistent with the discussion in Section 6.3.5 below;
- a discussion of alternative actions the applicant considered that would not result in take, and the reasons why such alternatives are not being utilized;
- additional measures USFWS, NMFS, and DFG may require as necessary or appropriate for compliance with FESA, CESA, and NCCPA; and
- a description of how and to what extent the action or group of actions addressed in the ASIP will help CALFED achieve the MSCS's goals for the affected species (i.e., how the ASIP implements the MSCS).

The ASIPs will be based in large part on the biological data, CALFED information, impacts analysis, and conservation measures in this MSCS. The ASIPs must be consistent with the species goals, prescriptions, and conservation measures in the MSCS for evaluated species affected by the proposed CALFED actions. Additional information and analysis will be required for many actions. Further, to fully comply with FESA, CESA, and NCCPA for a CALFED action, USFWS, NMFS, and DFG may require the ASIP to include additional measures for certain listed species or species proposed for listing if, for any reason, the species were not evaluated in this MSCS. The MSCS will assist an implementing entity in preparing an ASIP by offering programmatic information on the expected impacts of CALFED actions on species and habitats and programmatic conservation measures for those impacts.

The ASIPs will not address all regulatory and permitting needs for CALFED actions. Rather, nearly all CALFED actions will require environmental review and permitting under other State and Federal laws before they can be implemented.

C. Modification of NCCPA Program Approval

This NCCPA Program Approval may be modified or amended at the discretion of the Director of DFG.

D. Suspension and withdrawal of NCCPA Approval

This NCCPA Program Approval may be suspended or withdrawn, in whole or in part, upon determination by the Director of DFG that the MSCS no longer satisfies the requirements of the NCCPA, or that the CALFED Program has not been implemented in accordance with the MSCS, the Conservation Agreement or this NCCPA Program Approval.

E. Duration of NCCPA Approval

This NCCPA Program Approval shall remain effective for thirty years, unless suspended, withdrawn or extended by action of the Director of DFG.

Signed and dated:

Robert C. Hight

Robert C. Hight, Director
California Department of Fish and Game

6/28/00
Date

[1]All further references are to the California Fish and Game Code, unless otherwise indicated.

Appendix A

Table A-1. Species Evaluated for Coverage under the Natural Community Conservation Plan

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Mammals			
California wolverine[4] *Gulo gulo*	m	No	**Potential Impacts and Rationale:** The proposed Ecosystem Restoration Program (ERP) actions are not likely to provide a measurable benefit to the species. Raising Shasta Dam will increase reservoir water levels and could inundate marginal-quality habitat surrounding the Shasta Lake reservoir.
Giant kangaroo rat *Dipodomys ingens*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed within the species' range, the probability of adverse impacts on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface and groundwater storage and conveyance facilities within occupied habitat.
Greater western mastiff bat [Western mastiff bat] *Eumops perotis californicus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed within the species' range, the probability of adverse impacts on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface and groundwater storage and conveyance facilities near occupied roost sites.
Merced kangaroo rat *Dipodomys heermanni dixoni*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed within the species' range, the probability of adverse impacts on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface and groundwater storage and conveyance facilities within occupied habitat.
Nelson's antelope ground squirrel [San Joaquin antelope squirrel] *Ammospermophilus nelsoni*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed within the species' range, the probability of adverse impacts on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface and groundwater storage and conveyance facilities within occupied habitat.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Ringtail[4] *Bassariscus astutus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to approximately 11,800 acres of riparian habitat and enhance 17,000–25,000 acres of stream channel meander corridors throughout its current and historical range within the Multi-Species Conservation Strategy (MSCS) focus area. Ringtail populations and distribution would be expected to increase measurably over the life of the CALFED Bay-Delta Program (CALFED). A relatively small portion of the species' populations and range would likely be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats.
Riparian brush rabbit[5] *Sylvilagus bachmani riparius*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions designed to protect the existing Caswell Memorial State Park population and to establish four additional populations within the Delta and along the San Joaquin River. The species' populations and distribution are expected to increase measurably over the life of CALFED because of riparian and floodplain habitat restoration within the historical range of the species. The species' populations could be affected by ERP actions to improve occupied habitat and to protect and expand the existing population at Caswell State Park.
Salt-marsh harvest mouse[4] *Reithrodontomys raviventris*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore 7,500–12,000 acres and protect 6,200 acres of saline emergent wetlands throughout its current and historical range in the MSCS focus area and implement specific measures to assist in species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal saline emergent habitats.
San Joaquin kit fox *Vulpes macrotis mutica*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed within the species' range, the probability of adverse impacts on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface and groundwater storage and conveyance facilities within occupied habitat.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
San Joaquin Valley woodrat[5] [Riparian woodrat] *Neotoma fuscipes riparia*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions to protect the Caswell Memorial State Park population; restore 1,700–2,200 acres of riparian habitat within the species' historical range in the San Joaquin Valley; enhance 1,000 acres of stream channel meander corridor in the East San Joaquin Basin ecological management zone (EMZ); and implement specific measures to assist in achieving species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats.
San Pablo California vole [San Pablo vole] *Microtus californicus sanpabloensis*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore 7,500–12,000 acres and protect 6,200 acres of saline emergent wetlands and implement specific measures to assist in achieving species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal saline emergent habitats.
Suisun ornate shrew [Suisun shrew] *Sorex ornatus sinuosus*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore 7,500–12,000 acres and protect 6,200 acres of saline emergent wetlands and implement specific measures to achieve species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal saline emergent habitats.
Birds			
Aleutian Canada goose *Branta canadensis leucopareia*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would enhance over 205,000 acres of species foraging habitat (i.e., seasonal wetlands and agricultural lands) within or near traditional wintering areas in the Central Valley. No adverse impacts on the species' populations or habitat would be expected.
American peregrine falcon[4] *Falco peregrinus anatum*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 421,000 acres of species foraging habitat (i.e., permanent and seasonal wetlands) throughout its range in the MSCS focus area. No adverse impacts on the species' populations or habitat would be expected.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Bald eagle[4] *Haliaeetus leucocephalus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore or enhance riverine foraging habitat (e.g., restoration of up to at least 11,800 acres of riparian habitat and enhancement of 17,000–25,000 acres of stream channel meander corridors within the MSCS focus area). Construction of new reservoirs would increase the area of suitable foraging habitat and potentially create suitable nesting habitat area adjacent to new reservoirs. No adverse impacts on the species' populations or habitat would be expected.
Bank swallow *Riparia riparia*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to 25,000 acres of stream channel meander corridors within the species' current and historical range in the MSCS focus area and implement specific measures to assist in achieving species recovery. Enhancement of stream channel meander corridors is expected to create and sustain suitable nesting banks as a result of rehabilitating the erosion and deposition processes along rivers. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats (e.g., setting back levees if implemented near occupied nesting colonies).
Black-crowned night heron (rookery) *Nycticorax nycticorax*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to 11,800 acres of potentially suitable riparian nesting habitat and that would restore and enhance up to approximately 421,000 acres of species foraging habitat (e.g., permanent and seasonal wetlands). The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of potential riparian nesting habitat along the Sacramento and San Joaquin Rivers and their major tributaries within the species' range in the MSCS focus area could be affected. A small portion of suitable wetland habitat within the species' range in the MSCS focus area could also be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats near occupied rookeries.
Black tern *Chlidonias niger*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 421,000 acres of species foraging and nesting habitat (i.e., permanent and seasonal wetlands) within the MSCS focus area. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance wetland habitats near occupied colonies.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
California black rail[4] *Laterallus jamaicensis coturniculus*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit primarily from ERP actions that would restore and enhance up to approximately 84,000 acres of potential foraging and nesting habitat (i.e., tidal and nontidal permanent wetlands) within the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs and implement specific measures to assist in achieving species recovery. Reducing the adverse effects of boat wakes along channels that support nesting territories is also expected to increase nesting success. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with CALFED actions to restore or enhance occupied tidal and nontidal emergent habitats, improve levee stability, and improve conveyance through the Delta.
California brown pelican[4] *Pelecanus occidentalis californicus*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
California clapper rail[4] *Rallus longirostris obsoletus*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERF actions that would restore 7,500–12,000 acres and enhance 6,200 acres of saline emergent wetlands throughout its current and historical range in the MSCS focus area and implement specific measures to assist in achieving species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal saline emergent habitats.
California condor[4, 5] *Gymnogyps californianus*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
California gull *Larus californicus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 810,000 acres of potential species foraging habitat (i.e., permanent and seasonal wetlands, and agricultural lands) throughout its range in the MSCS focus area. Foraging and resting habitat would also be increased with construction of new storage reservoirs. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential impacts would most likely be associated with ERP habitat restoration and enhancement actions. The likelihood for adverse impacts could increase if the species were to establish nesting colonies within the MSCS focus area at or near where CALFED actions would be implemented.

Table A-1. Continued

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
California least tern[4] *Sterna antillarum browni*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions. There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with actions that could improve foodweb productivity in the Bay-Delta.
California yellow warbler [Yellow warbler] *Dendroica petechia brewsteri*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 11,800 acres of riparian habitat and enhance 17,000–25,000 acres of stream channel meander corridors within its current migration and historical nesting range in the MSCS focus area. A portion of restored riparian habitat will be designed specifically to provide suitable species nesting habitat. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. No adverse impacts on individuals would be expected. Potential adverse impacts could increase if the species were to reestablish nesting territories within the MSCS focus area at or near where CALFED actions would be implemented.
Cooper's hawk *Accipiter cooperi*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 11,800 acres of potentially suitable riparian nesting habitat and enhance 17,000–25,000 acres of stream channel meander corridors within the MSCS focus area. A substantial portion of species habitat along the Sacramento and San Joaquin Rivers and their major tributaries could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats near occupied nesting territories.
Double-crested cormorant (rookery) *Phalacrocorax auritus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to approximately 11,800 acres of potentially suitable riparian nesting habitat along stream channels and enhance 17,000–25,000 acres of stream channel meander corridors within the MSCS focus area. Foraging and resting habitat would also be increased with construction of new storage reservoirs. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats near occupied rookeries.
Golden eagle[4] *Aquila chrysaetos*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with actions to restore perennial grassland in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface and groundwater storage and conveyance facilities within occupied habitat.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Grasshopper sparrow *Ammodramus savannarum*	m	No	**Potential Impacts and Rationale:** There is potential for a relatively small and possibly unmeasurable species and species habitat benefit associated with enhancement of grasslands incidental to enhancement of existing seasonal wetlands in the American River Basin EMZ. No adverse impacts on the species' populations or habitat would be expected.
Great blue heron (rookery) *Ardea herodias*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to approximately 11,800 acres of potentially suitable riparian nesting habitat, that would restore and enhance up to approximately 421,000 acres of species foraging habitat (i.e., permanent and seasonal wetlands), and potential foraging habitat associated with enhancing 17,000–25,000 acres of stream channel meander corridors within the MSCS focus area. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs, and along and adjacent to the Sacramento and San Joaquin Rivers and their major tributaries, could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats near occupied rookeries.
Great egret (rookery) *Ardea albus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 845,000 acres of potential species nesting and foraging habitat (i.e., riparian, permanent and seasonal wetlands, and agricultural) within the MSCS focus area. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs, and along and adjacent to the Sacramento and San Joaquin Rivers and their major tributaries, could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats near occupied rookeries.
Greater sandhill crane[4] *Grus canadensis tabida*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore or enhance up to approximately 258,000 acres of suitable wintering habitat (i.e., seasonal wetland, perennial grassland, and agricultural) at and near traditional wintering areas located in the Sacramento-San Joaquin Delta, and Butte Basin EMZs and implement specific measures to assist in achieving species recovery. A substantial portion of traditional species wintering habitat within the Sacramento Valley and the Delta could be affected. Potential adverse impacts would most likely be associated with CALFED actions to restore or enhance riverine, floodplain, and wetland habitats, improve levee stability, and improve conveyance through the Delta in occupied habitat areas.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Least Bell's vireo *Vireo bellii pusillus*	r	Yes	**Potential Impacts and Rationale:** Species habitat is likely to benefit from ERP actions to restore 1,700–2,200 acres of riparian habitat within portions of the species' historical range in the San Joaquin Valley and enhance 1,000 acres of stream channel meander corridor in the East San Joaquin Basin EMZ and implement specific measures to assist in achieving species recovery. Restoration of this riparian habitat also contributes to recovery plan goals for this species. No adverse impacts on the species' populations or habitat would be expected.
Little willow flycatcher *Empidonax traillii brewsteri*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 11,800 acres of riparian habitat and enhance 17,000–25,000 acres of stream channel meander corridors within its current migration and historical nesting range in the MSCS focus area. A portion of restored riparian habitat will be designed specifically to provide suitable species nesting habitat. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. No direct or indirect take of individuals would be expected. Potential adverse impacts could increase if the species were to reestablish nesting territories within the MSCS focus area at or near where CALFED actions would be implemented.
Long-billed curlew *Numenius americanus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit primarily from increasing the area and quality of mudflat foraging habitat that would be associated with ERP actions to restore and enhance up to approximately 84,000 acres of tidal and nontidal permanent wetlands within the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. A substantial portion of species habitat in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal emergent habitats.
Long-eared owl *Asio otus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to approximately 11,800 acres of potentially suitable riparian nesting habitat and enhance potential foraging and nesting habitat associated with 17,000–25,000 acres of stream channel meander corridors within the MSCS focus area. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats near occupied nesting territories.
Mountain plover *Charadrius montanus*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with actions to enhance wildlife habitat values on agricultural lands in the Sacramento-San Joaquin Delta and Yolo Basin EMZs. A relatively small portion of species habitat within the species' range could be affected. Potential adverse effects would most likely be associated with ERP actions to enhance agricultural lands. No adverse impacts on individuals would be expected.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Northern harrier *Circus cyaneus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 810,000 acres of potential species nesting and foraging habitat (i.e., permanent and seasonal wetlands, and agricultural) in the MSCS focus area. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species foraging habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. A relatively small portion of species nesting habitat would likely be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance permanent and seasonal wetland habitats near occupied nesting territories.
Northern spotted owl *Strix occidentalis caurina*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Osprey *Pandion haliaetus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore or enhance riverine foraging habitat (e.g., restoration of up to approximately 11,800 acres of riparian habitat and enhancement of 17,000–25,000 acres of stream channel meander corridors within the MSCS focus area). Construction of new reservoirs would increase the area of suitable foraging habitat and potentially also create suitable nesting habitat area adjacent to new reservoirs. No adverse impacts on the species' populations or habitat would be expected.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore 7,500–12,000 acres and protect 6,200 acres of saline emergent wetlands throughout its current and historical range in the MSCS focus area and implement specific measures to assist in achieving species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal saline emergent habitats.
San Pablo song sparrow *Melospiza melodia samuelis*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore 7,500–12,000 acres and protect 6,200 acres of saline emergent wetlands throughout its current and historical range in the MSCS focus area and implement specific measures to achieve species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal saline emergent habitats.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Short-eared owl *Asio flammeus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 800,000 acres of potential species nesting and foraging habitat (i.e., permanent and seasonal wetlands, and agricultural) within the MSCS focus area. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance permanent and seasonal wetland habitats near occupied nesting territories.
Snowy egret (rookery) *Egretta thula*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 845,000 acres of potential species nesting and foraging habitat (i.e., riparian, permanent and seasonal wetlands, and agricultural) within the MSCS focus area. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs, and along and adjacent to the Sacramento and San Joaquin Rivers and their major tributaries, could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats near occupied rookeries.
Suisun song sparrow *Melospiza melodia maxillaris*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore 7,500–12,000 acres and protect 6,200 acres of saline emergent wetlands throughout its current and historical range in the MSCS focus area and implement specific measures to achieve species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the species' range in the MSCS focus area could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance occupied tidal and nontidal saline emergent habitats.
Swainson's hawk *Buteo swainsoni*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 765,000 acres of potential species nesting and foraging habitat (i.e., riparian, seasonal wetland, and agricultural) within the MSCS focus area and implement specific measures to assist in achieving species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat within the Delta and along and adjacent to the Sacramento and San Joaquin Rivers and their major tributaries could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats near occupied nesting territories.

Table A-1. Continued

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Tricolored blackbird *Agelaius tricolor*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 810,000 acres of potential species nesting and foraging habitat (i.e., permanent and seasonal wetlands, and agricultural) within the MSCS focus area. A substantial portion of species habitat within the Delta and along and adjacent to the Sacramento and San Joaquin Rivers and their major tributaries could be affected. Potential adverse impacts would most likely be associated with implementing ERP actions to restore or enhance riverine, floodplain, and wetland habitats near occupied nesting colonies.
Western burrowing owl [Burrowing owl] *Athene cunicularia hypugea*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with actions to restore perennial grassland in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with implementing ERP actions to restore or enhance perennial grasslands, and construction of new surface water and groundwater storage facilities and associated infrastructure near occupied nesting burrows.
Western least bittern *Ixobrychus exilis hesperis*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore and enhance up to approximately 421,000 acres of potential species nesting and foraging habitat (i.e., permanent and seasonal wetlands) within the species' historical range in the MSCS focus area. No adverse impacts on the species' populations or habitat would be expected.
Western snowy plover *Charadrius alexandrinus nivosus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit primarily from increasing the area and quality of mudflat foraging habitat that would be associated with ERP actions to restore and enhance up to approximately 84,000 acres of tidal and nontidal permanent wetlands within the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal and nontidal emergent habitats near occupied nesting areas.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to at least 11,800 acres of riparian habitat and enhance 17,000–25,000 acres of stream channel meander corridors within its current and historical nesting range in the MSCS focus area and implement specific measures to assist in achieving species recovery. A substantial portion of species habitat within the species' current and historical range in the Sacramento Valley could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats. The likelihood for impacts could increase if the species were to reestablish nesting territories within the MSCS focus area at or near where CALFED actions would be implemented.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
White-faced ibis *Plegadis chihi*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 810,000 acres of potential species nesting and foraging habitat (i.e., permanent and seasonal wetlands, and agricultural) within the species' current and historical range in the MSCS focus area. A substantial portion of species habitat within the range of the species in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance wetland habitats near occupied nesting colonies.
White-tailed kite[4] *Elanus leucurus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 765,000 acres of potential nesting and foraging habitat (i.e., riparian, seasonal wetland, and agricultural) within its current and historical range in the MSCS focus area. A substantial portion of species habitat along and adjacent to the Sacramento and San Joaquin Rivers and their major tributaries could be affected. Potential adverse impacts could most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats near occupied nesting territories.
Yellow-breasted chat *Icteria virens*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 11,800 acres of riparian habitat and enhance 17,000–25,000 acres of stream channel meander corridors within its current and historical nesting range in the MSCS focus area. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats near occupied nesting territories.
Reptiles			
Alameda whipsnake *Masticophis lateralis euryxanthus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with enlargement of Los Vaqueros Reservoir.
Blunt-nosed leopard lizard[4] *Gambelia silus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed within the species' range, the probability of adverse impacts on the species is low. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface and groundwater storage and conveyance facilities within occupied habitat.

Table A-1. Continued

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Giant garter snake *Thamnophis gigas*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 830,000 acres of potential species habitat (i.e., riparian, permanent and seasonal wetlands, and agricultural) throughout much of the species' range within the MSCS focus area and implement specific measures to achieve species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. A substantial portion of species habitat in the Sacramento-San Joaquin Delta and Eastside Delta Tributaries EMZs, and along and adjacent to the Sacramento River and its major tributaries, could be affected over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats and actions to improve conveyance through the Delta in occupied habitat areas.
San Joaquin whipsnake *Masticophis flagellum ruddocki*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed within the species' range, the probability of adverse impacts on the species is low. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely only be associated with reservoir enlargement and construction of surface storage reservoirs and conveyance facilities within occupied habitat.
Western pond turtle *Clemmys marmorata*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 11,800 acres of riparian habitat and enhance 17,000–25,000 acres of stream channel meander corridors, including areas within its current and historical range in the MSCS focus area. A relatively small portion of the species' habitat within its range could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats in occupied habitat areas.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Amphibians			
California red-legged frog *Rana aurora draytonii*	m	No	**Potential Impacts and Rationale:** With implementation of ERP actions to restore and enhance wetland and riparian habitats and stream channel corridors, there is potential for a substantial increase in habitat quantity and quality within historically occupied habitats. The potential for direct species benefits, however, is likely to be minor because most improved habitat areas would not be located near existing source populations and would likely support non-native predator populations. A relatively small portion of occupied species habitat within the species' range could be affected by most actions. A substantial portion of one major population could be affected if Los Vaqueros Reservoir were enlarged. Potential adverse impacts would most likely be associated with implementation of ERP actions near occupied habitat areas or enlargement of Los Vaqueros Reservoir.
California tiger salamander *Ambystoma californiense*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with actions to restore and enhance perennial grasslands and vernal pools in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface storage reservoirs and conveyance facilities within occupied habitat.
Foothill yellow-legged frog *Rana boylii*	m	No	**Potential Impacts and Rationale:** With implementation of ERP actions to restore and enhance riparian habitats and stream channel corridors, there is potential for a substantial increase in habitat quantity and quality within historically occupied habitats. The potential for direct species benefits, however, is likely to be minor because most improved habitat areas would not be located near existing source populations and would likely support non-native predator populations. A relatively small portion of occupied species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with implementation of ERP actions, reservoir enlargement, and construction of new surface storage facilities near occupied habitat areas.
Limestone salamander[4] *Hydromantes brunus*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Shasta salamander *Hydromantes shastae*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. A substantial portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with enlargement of the Shasta Lake reservoir.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Western spadefoot *Scaphiopus hammondii*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with actions to restore and enhance perennial grasslands and vernal pools in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs and enhance managed seasonal wetland habitats in the Delta, Sacramento River, and San Joaquin River Regions. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with implementation of ERP actions, construction of enlarged or new surface storage reservoirs, and conveyance facilities within occupied habitat.
Fishes			
Central California Coast steelhead Evolutionarily Significant Unit (ESU) *Oncorhynchus mykiss*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with actions to enhance riverine habitats along tributaries to San Pablo Bay. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with implementation of ERP actions to improve riverine habitat conditions in occupied rivers.
Central Valley fall-/late-fall-run chinook salmon ESU *Oncorhynchus tshawytscha*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; enhance 17,000–25,000 acres of stream channel meander corridors; restore up to 11,800 acres of riparian habitat adjacent to river channels; improve flows for the species; rehabilitate erosional and depositional processes and other ecological processes; restore connectivity with historical floodplains and overflow basins; and implement specific measures to achieve species recovery. Species would also likely benefit from ERP actions to reduce the adverse effects of stressors, such as screening diversions, reducing levels of illegal harvest, and improving management of hatchery stocks. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation would affect all life stages throughout most or all of the species' range. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal, riverine, and floodplain habitats, and construction and improvements to and operation of conveyance facilities.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Central Valley spring-run chinook salmon ESU [Spring-run chinook salmon] *Oncorhynchus tshawytscha*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; enhance 17,000–25,000 acres of stream channel meander corridors; restore up to 11,800 acres of riparian habitat adjacent to river channels; improve flows for the species; rehabilitate erosional and depositional processes and other ecological processes; restore connectivity with historical floodplains and overflow basins; and implement specific measures to achieve species recovery. Species would also likely benefit from ERP actions to reduce the adverse effects of stressors, such as screening diversions, reducing levels of illegal harvest, and improving management of hatchery stocks. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation would affect all life stages throughout most or all of the species' range. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal, riverine, and floodplain habitats, and construction and improvements to and operation of conveyance facilities.
Central Valley steelhead ESU *Oncorhynchus mykiss*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; enhance 17,000–25,000 acres of stream channel meander corridors; restore up to 11,800 acres of riparian habitat adjacent to river channels; improve flows for the species; rehabilitate erosional and depositional processes and other ecological processes; restore connectivity with historical floodplains and overflow basins; and implement specific measures to achieve species recovery. Species would also likely benefit from ERP actions to reduce the adverse effects of stressors, such as screening diversions, reducing levels of illegal harvest, and improving management of hatchery stocks. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation would affect all life stages throughout most or all of the species' range. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal, riverine, and floodplain habitats, and construction and improvements to and operation of conveyance facilities.
Delta smelt *Hypomesus transpacificus*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; improve flows for the species; reduce the adverse effects of stressors, such as screening diversions and improving management of flows for the species in the Delta; and implement specific measures to achieve species recovery. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation would affect all life stages throughout most or all of the species' range. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal habitats and improvements to and operation of conveyance facilities.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Green sturgeon *Acipenser medirostris*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; enhance 17,000–25,000 acres of stream channel meander corridors; restore up to 11,800 acres of riparian habitat adjacent to river channels; and implement specific measures to achieve species recovery. Species could also likely benefit from ERP actions to reduce the adverse effects of stressors, such as screening diversions and reducing levels of illegal harvest. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation could affect all life stages throughout most or all of the species' range in the MSCS focus area. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal, riverine, and floodplain habitats, and construction and improvements to and operation of conveyance facilities.
Hardhead *Mylopharodon conocephalus*	m	No	**Potential Impacts and Rationale:** There is potential for some relatively localized species and species habitat benefit associated with ERP actions to improve riverine habitat conditions. CALFED implementation could affect all life stages along occupied portions of the Sacramento and San Joaquin Rivers and their major tributaries within the MSCS focus area. Potential adverse impacts would most likely be associated with ERP actions to restore and enhance riverine and floodplain habitats.
Longfin smelt *Spirinchus thaleichthys*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; improve flows for the species; reduce the adverse effects of stressors, such as screening diversions and improving management of flows for the species in the Delta; and implement specific measures to achieve species recovery. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation would affect all life stages throughout most or all of the species' range. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal habitats and improvements to and operation of conveyance facilities.
McCloud River redband trout *Oncorhynchus mykiss* ssp. 2	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with enlarging the Shasta Lake reservoir.
Rough sculpin *Cottus asperrimus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with enlargement of the Shasta Lake reservoir.

Table A-1. Continued

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Sacramento perch *Archoplites interruptus*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore suitable aquatic habitats and reintroduce and establish new populations within the species' historical range. A relatively small portion of the population would be affected by ERP actions that reintroduce and establish new populations.
Sacramento River winter-run chinook salmon ESU [Winter-run chinook salmon] *Oncorhynchus tshawytsha*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; enhance 16,000–24,000 acres of stream channel meander corridors; restore up to approximately 5,800 acres of riparian habitat along river channels; improve flows for the species; rehabilitate erosional and depositional processes and other ecological processes; restore connectivity with historical floodplains and overflow basins; and implement specific measures to achieve species recovery. Species would also likely benefit from ERP actions to reduce the adverse effects of stressors, such as screening diversions, reducing levels of illegal harvest, and improving management of hatchery stocks. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation would affect all life stages throughout most or all of the species' range. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal, riverine, and floodplain habitats, and construction and improvements to and operation of conveyance facilities.
Sacramento splittail *Pogonichthys macrolepidotus*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore and enhance up to approximately 64,000 acres of tidal wetlands, shoals, and channel islands; enhance 17,000–25,000 acres of stream channel meander corridors; restore up to 11,800 acres of riparian habitat along river channels; improve flows for the species; rehabilitate erosional and depositional processes and other ecological processes; restore connectivity with historical floodplains and overflow basins; and implement specific measures to achieve species recovery. Species would also likely benefit from ERP actions to reduce the adverse effects of stressors, such as screening diversions. The species' population is expected to increase measurably over the life of CALFED. CALFED implementation would affect all life stages throughout most or all of the species' range. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance tidal, riverine, and floodplain habitats, and construction and improvements to and operation of conveyance facilities.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Tidewater goby *Eucyclogobius newberryi*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species and species habitat benefit associated with ERP actions to restore tidal wetlands in the Suisun Marsh/North San Francisco Bay EMZ and that would possibly improve the Bay-Delta aquatic foodweb. A relatively small portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with actions to restore tidal wetlands in occupied habitat areas.
Invertebrates			
California freshwater shrimp[5] *Syncaris pacifica*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Callippe silverspot[5] [Callippe silverspot butterfly] *Speyeria callippe callippe*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Conservancy fairy shrimp *Branchinecta conservatio*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small species' habitat benefits associated with ERP actions to restore and enhance up to 100 acres of vernal pool habitat and up to 1,000 acres of associated watershed in the Suisun Marsh/North San Francisco Bay EMZ. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with construction of new surface storage facilities and associated infrastructure.
Delta green ground beetle *Elaphrus viridis*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that reintroduce and establish three new populations and restore and enhance up to approximately 100 acres of suitable vernal pool habitat and 1,000 acres of associated watershed adjacent to the only known species population at the Jepson Prairie Preserve. A relatively small portion of the population would likely be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat.
Lange's metalmark[5] [Lange's metalmark butterfly] *Apodemia mormo langei*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would achieve species recovery plan goals, including restoration and enhancement of up to 100 acres of suitable inland dune scrub habitat within and adjacent to the only known species population. Individuals and habitat could be affected by ERP actions to improve occupied habitat and expand the existing population at Antioch Dunes.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Longhorn fairy shrimp *Branchinecta longiantenna*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small species habitat benefit associated with ERP actions to restore and enhance up to 100 acres of vernal pool habitat and up to 1,000 acres of associated watershed in the Suisun Marsh/North San Francisco Bay EMZ. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with construction of new surface storage facilities and associated infrastructure.
Mid-valley fairy shrimp *Branchinecta n.* sp. "mid-valley"	m	No	**Potential Impacts and Rationale:** There is potential for relatively small species habitat benefit associated with ERP actions to restore and enhance up to 100 acres of vernal pool habitat and up to 1,000 acres of associated watershed in the Suisun Marsh/North San Francisco Bay EMZ. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with construction of new surface storage facilities and associated infrastructure.
Monarch butterfly (roost) *Danaus plexippus*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species habitat benefit associated with ERP actions that could restore suitable roost habitat within the species' current or historical range. No direct or indirect impacts on individuals would be expected.
Shasta sideband *Monadenia troglodytes*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. A substantial portion of species habitat within the species' range could be affected. Potential adverse impacts would most likely be associated with enlargement of the Shasta Lake reservoir.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to at least 11,800 acres of riparian habitat; improve ecological processes that sustain suitable riparian habitat through enhancement of 17,000–25,000 acres of stream channel meander corridors; increase connectivity among populations; and implement specific measures to achieve species recovery. The species would also benefit from CALFED actions that improve vegetation management for the species on levees. The species' population is expected to increase measurably over the life of CALFED. A substantial portion of species habitat along the Sacramento and San Joaquin Rivers and their major tributaries could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore and enhance riverine and floodplain habitats.
Vernal pool fairy shrimp *Branchinecta lynchi*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small species habitat benefit associated with ERP actions to restore and enhance up to 100 acres of vernal pool habitat and up to 1,000 acres of associated watershed in the Suisun Marsh/North San Francisco Bay EMZ. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with construction of new surface storage facilities and associated infrastructure.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Vernal pool tadpole shrimp *Lepidurus packardi*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small species habitat benefit associated with ERP actions to restore and enhance up to 100 acres of vernal pool habitat and up to 1,000 acres of associated watershed in the Suisun Marsh/North San Francisco Bay EMZ. A relatively small portion of species habitat within the species' range in the MSCS focus area could be affected. Potential adverse impacts would most likely be associated with construction of new surface storage facilities and associated infrastructure.
Plants			
Henderson's bent grass[5] *Agrostis hendersonii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. The probability of adverse effects is low. Potential adverse impacts would likely be associated with construction at proposed storage facilities in Stanislaus and Tehama Counties.
Sharsmith's onion[5] *Allium sharsmithae*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Rawhide Hill onion *Allium tuolumnense*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Sonoma alopecurus[5] *Alopecurus aequalis* var. *sonomensis*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Large-flowered fiddleneck[5] *Amsinckia grandiflora*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Dimorphic snapdragon *Antirrhinum subcordatum*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Tehama, Glenn, and Colusa Counties.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Mt. Diablo manzanita *Arctostaphylos auriculata*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Baker's manzanita *Arctostaphylos bakeri* ssp. *bakeri*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Klamath manzanita[5] *Arctostaphylos klamathensis*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Contra Costa manzanita[5] *Arctostaphylos manzanita* ssp. *laevigata*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Ione manzanita[5] *Arctostaphylos myrtifolia*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Pallid manzanita *Arctostaphylos pallida*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Suisun Marsh aster *Aster lentus*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would expand the length of occupied habitat along sloughs and channels by 100 miles, protect at least 90% of currently occupied habitat areas, and enhance and restore approximately 64,000 acres of tidal wetlands in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. The species' populations and distribution are expected to increase substantially over the life of CALFED. A substantial portion of known occurrences of the species' populations and habitat could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat, and actions to improve levee stability and conveyance through the Delta.
Clara Hunt's milk-vetch[5] *Astragalus clarianus*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Big Bear Valley woollypod *Astragalus leucolobus*	m	No	**Potential Impacts and Rationale:**. The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. CALFED actions could affect occurrences in San Benito County. Potential adverse impacts would most likely be associated with construction of a new surface storage reservoir and associated facilities proposed for San Benito County.
Jepson's milk-vetch *Astragalus rattanii* var. *jepsonianus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Glenn County.
Ferris's milk-vetch[5] *Astragalus tener* var. *ferrisiae*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Alkali milk-vetch *Astragalus tener* var. *tener*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would protect extant populations in the MSCS focus area, enhance and restore up to 100 acres of vernal pools and 1,000 acres of associated watershed near the existing Jepson Prairie Preserve population, and establish new populations near extirpated populations. The species' populations and distribution are expected to increase substantially over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat, reservoir enlargement, and construction of new
Heartscale *Atriplex cordulata*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities.
Brittlescale *Atriplex depressa*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface storage reservoirs and associated facilities.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
San Joaquin spearscale [San Joaquin saltbush] *Atriplex joaquiniana*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities.
Lesser saltscale[5] *Atriplex minuscula*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Vernal Pool smallscale *Atriplex persistens*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Lost Hills crownscale *Atriplex vallicola*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities.
Sonoma sunshine[5] *Blennosperma bakeri*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Big tarplant *Blepharizonia plumosa* ssp. *plumosa*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Indian Valley brodiaea *Brodiaea coronaria* ssp. *rosea*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Tehama, Glenn, and Colusa Counties.
Chinese Camp brodiaea[5] *Brodiaea pallida*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Mt. Diablo fairy-lantern *Calochortus pulchellus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Tiburon Mariposa lily[5] *Calochortus tiburonensis*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Stebbins' morning-glory[5] *Calystegia stebbinsii*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
San Benito evening-primrose *Camissonia benitensis*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of a new surface storage reservoir and associated facilities proposed for San Benito County.
Sharsmith's harebell *Campanula sharsmithiae*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. A substantial portion of known species occurrences could be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
White sedge[5] *Carex albida*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Bristly sedge[5] *Carex comosa*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would that restore up to 19,600 acres of nontidal freshwater emergent wetland in the Sacramento-San Joaquin Delta EMZ and development and implementation of specific measures to assist in achieving species recovery. The species' populations and distribution are expected to increase measurably over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to enhance and restore wetland habitat in the Sacramento-San Joaquin Delta.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Tree-anemone[5] *Carpenteria californica*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Millerton Lake reservoir.
Tiburon Indian paintbrush[5] *Castilleja affinis* ssp. *neglecta*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Succulent owl's-clover *Castilleja campestris* ssp. *succulenta*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities.
Mason's ceanothus[5] *Ceanothus masonii*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Pine Hill ceanothus[5] *Ceanothus roderickii*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Hoover's spurge *Chamaesyce hooveri*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities.
Dwarf soaproot *Chlorogalum pomeridianum* var. *minus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Tehama, Glenn, and Colusa Counties.
Sonoma spineflower[5] *Chorizanthe valida*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Slough thistle *Cirsium crassicaule*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 6,800 acres of riparian and 19,600 acres of nontidal freshwater permanent emergent wetland habitat in the Sacramento-San Joaquin Delta, Eastside Delta Tributaries, and San Joaquin River EMZs. The species' populations and distribution would be expected to increase measurably over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to enhance habitat along the San Joaquin River.
Suisun thistle *Cirsium hydrophilum* var. *hydrophilum*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would protect and maintain extant populations, establish 10 new populations, increase the population size 10-fold, and enhance and restore up to 18,200 acres of saline emergent wetlands in the Suisun Marsh/North San Francisco Bay EMZ. The species' populations and distribution are expected to increase substantially over the life of CALFED. The only known occurrence on Grizzly Island potentially could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat.
Mariposa clarkia *Clarkia biloba* ssp. *australis*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Shasta clarkia[5] *Clarkia borealis* ssp. *arida*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrence, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of the Shasta Lake reservoir.
Beaked clarkia[5] *Clarkia rostrata*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrence, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Point Reyes bird's-beak *Cordylanthus maritimus* ssp. *palustris*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would that would maintain, enhance, and restore high marsh and high marsh-upland transition habitat in conjunction with restoration of up to 5,000 acres of saline emergent wetlands around San Pablo Bay near occupied habitat. The species' populations and distribution are expected to increase measurably over the life of CALFED. No adverse impacts on individuals would be expected.
Soft bird's-beak *Cordylanthus mollis* ssp. *mollis*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would maintain current distribution and existing populations, enhance and restore up to approximately 18,200 acres of saline emergent wetlands in the Suisun Marsh/North San Francisco Bay EMZ, and establish new populations in enhanced and restored habitats. The species' populations and distribution are expected to increase substantially over the life of CALFED. A substantial portion of known species occurrences could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat, and actions to improve levee stability and conveyance through the Delta.
Hispid bird's-beak *Cordylanthus mollis* ssp. *hispidus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would enhance and restore up to 100 acres of vernal pools and 1,000 acres of associated watershed near the Jepson Prairie Preserve. The species' populations and distribution are expected to increase measurably over the life of CALFED. No adverse impacts on individuals would be expected.
Mt. Diablo bird's-beak[5] *Cordylanthus nidularius*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Palmate-bracted bird's-beak[5] *Cordylanthus palmatus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with ERP actions to restore and enhance habitat.
Mt. Hamilton coreopsis *Coreopsis hamiltonii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Silky cryptantha *Cryptantha crinita*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 3,150 acres of riparian habitat in the Cottonwood Creek Basin EMZ and enhance 16,000–24,000 acres of stream channel meander corridor along the Sacramento River. The species' populations and distribution are expected to increase measurably over the life of CALFED. Known species occurrences along Cottonwood Creek and the Sacramento River could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine and floodplain habitats.
Baker's larkspur *Delphinium bakeri*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Hospital Canyon larkspur *Delphinium californicum* ssp. *interius*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir and construction of proposed new surface storage reservoirs in Stanislaus County.
Yellow larkspur *Delphinium luteum*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Recurved larkspur *Delphinium recurvatum*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface storage reservoirs and associated facilities.
Four-angled spikerush *Eleocharis quadrangulata*	m	No	**Potential Impacts and Rationale:** There is a potential for relatively small and possibly unmeasurable species habitat benefit associated with ERP actions to improve stream channel meander corridors and enhance seasonal wetlands in the Sacramento Valley. A portion of known species occurrences could be affected, particularly those located in the Sacramento River floodplain and the Butte Basin EMZ. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats in the Sacramento Valley.
Brandegee's eriastrum *Eriastrum brandegeae*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Tehama and Glenn Counties.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Hoover's eriastrum *Eriastrum hooveri*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for the San Joaquin River Region.
Ione buckwheat[5] *Eriogonum apricum* var. *apricum*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Irish Hill buckwheat[5] *Eriogonum apricum* var. *prostratum*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Ben Lomond buckwheat[5] *Eriogonum nudum* var. *decurrens*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Loch Lomond button-celery[5] *Eryngium constancei*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Delta coyote-thistle [Delta button-celery] *Eryngium racemosum*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would restore up to approximately 2,200 acres of riparian habitat in the San Joaquin River and West San Joaquin River Basin EMZs, protect and enhance up to 1,000 acres of stream channel meander corridor in East San Joaquin River Basin EMZ, increase populations and individuals by 25% over present numbers, increasing suitable habitat by at least 50%, and protecting at least 50% of existing populations and individuals. The species' populations and distribution are expected to increase substantially over the life of CALFED. A substantial portion of known species occurrences located along the San Joaquin River and its major tributaries could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and restore or enhance riverine and floodplain habitats.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Spiny-sepaled button-celery *Eryngium spinosepalum*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus and Madera Counties.
Contra Costa wallflower *Erysimum capitatum* ssp. *angustatum*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would protect the existing Antioch Dunes' population, enhance 50–100 acres of low quality Antioch Dunes habitat, and achieve USFWS recovery plan goals. The species' populations and distribution are expected to increase measurably over the life of CALFED. A relatively small portion of the population would likely be affected. Potential adverse impacts would be associated with ERP actions to enhance occupied habitat.
Diamond-petaled California poppy[5] *Eschscholzia rhombipetala*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with enlargement of Los Vaqueros Reservoir and construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Pine Hill flannelbush[5] *Fremontodendron decumbens*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Adobe-lily *Fritillaria pluriflora*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Glenn and Colusa Counties.
El Dorado bedstraw[5] *Galium californicum* ssp. *sierrae*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Boggs Lake hedge-hyssop *Gratiola heterosepala*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of an isolated facility and associated facilities.
Diablo helianthella *Helianthella castanea*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Hall's tarplant[5] *Hemizonia halliana*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. A portion of occurrences or historically recorded occurrence sites could be affected by proposed surface storage in San Benito County.
Congdon's tarplant *Hemizonia parryi* ssp. *congdonii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Brewer's western flax *Hesperolinon breweri*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Marin western flax *Hesperolinon congestum*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Drymaria-like western flax *Hesperolinon drymarioides*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Glenn and Colusa Counties.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Napa western flax *Hesperolinon serpentinum*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Glenn, Colusa, and Stanislaus Counties.
Tehama County western flax[5] *Hesperolinon tehamense*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Tehama and Glenn Counties.
Rose-mallow *Hibiscus lasiocarpus*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 65,000 acres of tidal and nontidal freshwater emergent wetland in the Sacramento-San Joaquin Delta EMZ and enhance up to approximately 24,000 acres of stream channel meander corridor along the Sacramento River. The species' populations and distribution would be expected to increase measurably over the life of CALFED. A substantial portion of known species occurrences could be affected. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance wetland and floodplain habitats, and actions to improve levee stability and conveyance through the Delta.
Santa Cruz tarplant *Holocarpha macradenia*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Parry's horkelia[5] *Horkelia parryi*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Carquinez goldenbush *Isocoma arguta*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions to restore and enhance up to 100 acres of vernal pools and 1,000 acres of associated watershed near the Jepson Prairie Preserve. The species' populations and distribution are expected to increase measurably over the life of CALFED. Occurrences in Solano County could be affected. Potential adverse impacts would most likely be associated with ERP actions to enhance and restore occupied habitat.
Northern California black walnut (native stands) *Juglans hindsii*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would protect existing stands and establish 5–10 additional self-sustaining populations. A portion of known native stands could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Ahart's dwarf rush[5] *Juncus leiospermus* var. *ahartii*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Contra Costa goldfields[5] *Lasthenia conjugens*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions to restore and enhance up to 100 acres of vernal pools and 1,000 acres of associated watershed near the Jepson Prairie Preserve. The species' populations and distribution are expected to increase measurably over the life of CALFED. No adverse impacts on individuals would be expected.
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would expand the length of occupied habitat along sloughs and channels by 100 miles, protect at least 90% of currently occupied habitat areas, and enhance and restore approximately 64,000 acres of tidal wetlands in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. The species' populations and distribution are expected to increase substantially over the life of CALFED. A substantial portion of known species occurrences could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat, and actions to improve levee stability and conveyance through the Delta.
Pale-yellow layia[5] *Layia heterotricha*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the construction of proposed surface storage reservoirs in San Benito County.
Legenere *Legenere limosa*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
San Joaquin woollythreads *Lembertia congdonii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with reservoir enlargement and construction of new surface storage reservoirs and associated facilities in the San Joaquin Valley.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Panoche pepper-grass *Lepidium jaredii* ssp. *album*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of surface storage reservoirs and associated facilities proposed for San Benito and Madera Counties.
Heckard's pepper-grass[5] *Lepidium latipes* var. *heckardii*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions to restore and enhance up to 100 acres of vernal pools and 1,000 acres of associated watershed near the Jepson Prairie Preserve. The species' populations and distribution are expected to increase measurably over the life of CALFED. A relatively small portion of occurrences would likely be affected. Potential adverse impacts would most likely be associated with ERP actions to enhance and restore occupied habitat.
Saw-toothed lewisia *Lewisia serrata*	m	No	**Potential Impacts and Rationale:** There is potential for relatively small and possibly unmeasurable species habitat benefit associated with actions to improve riparian habitat and stream channel meander corridors in the American River Basin and Feather River/Sutter Basin EMZs. No adverse impacts on individuals would be expected.
Pitkin Marsh lily[5] *Lilium pardalinum* ssp. *pitkinense*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Mason's lilaeopsis *Lilaeopsis masonii*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would expand the length of occupied habitat along sloughs and channels by 100 miles, protect at least 90% of currently occupied habitat areas, and enhance and restore approximately 63,000 acres of tidal wetlands in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. The species' populations and distribution are expected to increase substantially over the life of CALFED. A substantial portion of known species occurrences could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat; actions to improve levee stability and conveyance through the Delta; and with construction of proposed surface storage reservoirs in the Delta.
Bellinger's meadowfoam[5] *Limnanthes floccosa* ssp. *bellingeriana*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences and habitat, the potential for adverse effects is low. Potential adverse impacts would most likely be be associated with the proposed enlargement of the Shasta Lake reservoir.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Butte County meadowfoam[5] *Limnanthes floccosa* ssp. *californica*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Sebastopol meadowfoam[5] *Limnanthes vinculans*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Delta mudwort *Limosella subulata*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would expand the length of occupied habitat along sloughs and channels by 100 miles, protect at least 90% of currently occupied habitat areas, and enhance and restore approximately 64,000 acres of tidal wetlands in the Sacramento-San Joaquin Delta and Suisun Marsh/North San Francisco Bay EMZs. The species' populations and distribution are expected to increase substantially over the life of CALFED. A substantial portion of known species occurrences could be affected. Potential adverse impacts would most likely be associated with ERP actions to establish new populations and enhance occupied habitat; actions to improve levee stability and conveyance through the Delta; and construction of proposed surface storage reservoirs in the Delta.
Mt. Tedoc linanthus[5] *Linanthus nuttallii* ssp. *howellii*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Madera linanthus *Linanthus serrulatus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. A relatively small portion of known species occurrences could be affected. Potential adverse impacts would most likely be associated with enlargement of Millerton Lake reservoir in Madera County.
Congdon's lomatium *Lomatium congdonii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Red-flowered lotus[5] *Lotus rubriflorus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Shaggyhair lupine *Lupinus spectabilis*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Showy madia *Madia radiata*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir and construction of proposed new surface storage reservoirs in Stanislaus County.
Hall's bush mallow *Malacothamnus hallii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
San Antonio Hills monardella *Monardella antonina* ssp. *antonina*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for the San Joaquin River Region.
Few-flowered navarretia[5] *Navarretia leucocephala* ssp. *pauciflora*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Many-flowered navarretia[5] *Navarretia leucocephala* ssp. *plieantha*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Pincushion navarretia[5] *Navarretia myersii* ssp. *myersii*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Colusa grass *Neostapfia colusana*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions to restore and enhance up to 100 acres of vernal pools and 1,000 acres of associated watershed near the Jepson Prairie Preserve. The species' populations and distribution are expected to increase measurably over the life of CALFED. No adverse impacts on individuals would be expected.
Shasta snow-wreath[5] *Neviusia cliftonii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse effects would most likely be associated with the proposed enlargement of the Shasta Lake reservoir.
Antioch Dunes evening-primrose *Oenothera deltoides* ssp. *howellii*	R	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that would protect the existing Antioch Dunes' population, enhance 50–100 acres of low-quality Antioch Dunes habitat, and achieve USFWS recovery plan goals. The species' populations and distribution are expected to increase measurably over the life of CALFED. A relatively small portion of the population would likely be affected. Potential adverse impacts would most likely be associated with ERP actions to enhance occupied habitat.
San Joaquin Valley orcutt grass[5] *Orcuttia inaequalis*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Hairy orcutt grass[5] *Orcuttia pilosa*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Slender orcutt grass *Orcuttia tenuis*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities.
Sacramento orcutt grass[5] *Orcuttia viscida*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Ahart's paronychia *Paronychia ahartii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new surface or groundwater storage and associated facilities.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Thread-leaved beardtongue *Penstemon filiformis*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
White-rayed pentachaeta[5] *Pentachaeta bellidiflora*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Merced phacelia *Phacelia ciliata* var. *opaca*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Mt. Diablo phacelia[5] *Phacelia phacelioides*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus and San Benito Counties.
Calistoga popcorn-flower[5] *Plagiobothrys strictus*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
North Coast semaphore grass[5] *Pleuropogon hooverianus*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Napa blue grass[5] *Poa napensis*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Marin knotweed[5] *Polygonum marinense*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would that would maintain, enhance, and restore up to 5,000 acres of saline emergent wetlands around San Pablo Bay near occupied habitat. The species' populations and distribution are expected to increase measurably over the life of CALFED. No adverse impacts on individuals would be expected.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Eel-grass pondweed[5] *Potamogeton zosteriformis*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to 19,600 acres of nontidal freshwater emergent wetland in the Sacramento-San Joaquin Delta EMZ. The species' populations and distribution are expected to increase measurably over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to enhance and restore wetlands in the Sacramento-San Joaquin Delta.
Hartweg's golden sunburst *Pseudobahia bahiifolia*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with construction of new storage facilities proposed for Sutter, Stanislaus, and Madera Counties.
San Joaquin adobe sunburst *Pseudobahia peirsonii*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
California beaked-rush[5] *Rhynchospora californica*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Sanford's arrowhead *Sagittaria sanfordii*	m	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to benefit from ERP actions that would restore up to approximately 19,600 acres of nontidal freshwater permanent emergent wetland habitat in the Sacramento-San Joaquin Delta EMZ and enhance up to approximately 25,000 acres of stream channel meander corridor in the Sacramento River and San Joaquin River Regions. The species' populations and distribution are expected to increase measurably over the life of CALFED. A portion of known species occurrences could be affected, particularly those located in the Sacramento-San Joaquin Delta EMZ and within the floodplains of the Sacramento and San Joaquin Rivers and their major tributaries. Potential adverse impacts would most likely be associated with ERP actions to restore or enhance riverine, floodplain, and wetland habitats, and actions to improve levee stability and conveyance through the Delta.
Rock sanicle *Sanicula saxatilis*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Marsh skullcap *Scutellaria galericulata*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is assessed as moderate. Known species occurrences in the Sacramento-San Joaquin Delta EMZ could be affected. Known species occurrences elsewhere are unlikely to be affected by CALFED. Potential adverse impacts would most likely be associated with ERP actions to enhance and restore wetlands, and actions to improve levee stability and conveyance through the Delta.
Mad-dog skullcap[5] [Blue skullcap] *Scutellaria lateriflora*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Red Hills ragwort[5] *Senecio clevelandii* var. *heterophyllus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Layne's ragwort[5] *Senecio layneae*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Marin checkerbloom[5] *Sidalcea hickmanii* ssp. *viridis*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Marsh checkerbloom *Sidalcea oregana* ssp. *hydrophila*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Tehama, Glenn, and Colusa Counties.
Kenwood Marsh checkerbloom[5] *Sidalcea oregana* ssp. *valida*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
English peak greenbriar *Smilax jamesii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with the proposed enlargement of the Shasta Lake reservoir.
Most beautiful jewel-flower *Streptanthus albidus* ssp. *peramoenus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir, and the in-Delta storage project.
Mt. Hamilton jewel-flower[5] *Streptanthus callistus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Mt. Diablo jewel-flower *Streptanthus hispidus*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with the proposed enlargement of Los Vaqueros Reservoir.
Arburua Ranch jewel-flower *Streptanthus insignis* ssp. *lyonii*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.
Tiburon jewel-flower[5] *Streptanthus niger*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
California seablite[5] *Suaeda californica*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Showy Indian clover *Trifolium amoenum*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.

MSCS Evaluated Species[1]	MSCS Species Goal	NCCP Covered[2]	Potential Impacts and Rationale for Including or Excluding Species as Covered Species[3]
Greene's tuctoria[5] *Tuctoria greenei*	m	No	**Potential Impacts and Rationale:** The species' populations and habitat are unlikely to be affected by CALFED actions.
Crampton's tuctoria[5] *Tuctoria mucronata*	r	Yes	**Potential Impacts and Rationale:** The species' populations and habitat are likely to substantially benefit from ERP actions that reintroduce and establish three new populations and restore and enhance up to approximately 100 acres of suitable vernal pool habitat and 1,000 acres of associated watershed adjacent to the Jepson Prairie Preserve. The species' populations and distribution are expected to increase substantially over the life of CALFED. Potential adverse impacts would most likely be associated with ERP actions to expand the species' populations and improve occupied habitat.
California vervain[5] *Verbena californica*	m	No	**Potential Impacts and Rationale:** The proposed ERP actions are not likely to provide a measurable benefit to the species. Based on the number and types of actions proposed near known species occurrences, the probability of adverse effects on the species is low. No known species occurrences would likely be affected. Potential adverse impacts would most likely be associated with construction of new surface storage reservoirs and associated facilities proposed for Stanislaus County.

Notes:

[1] CDFG common name designations shown in brackets.

[2] Covered species determinations were made using the assumption that all proposed CALFED actions evaluated in the MSCS and MSCS conservation measures will be implemented and that all impacts on species will be fully mitigated. The potential for impacts on species was determined by comparing the known and potential distribution of each species to locations where CALFED actions could be implemented. CALFED was assumed to have beneficial effects on a species if CALFED actions would directly benefit the species (e.g., establishing new species' populations) or would improve or restore suitable species habitat in locations were the species is present or where the species could colonize the improved or restored habitat.

[3] All habitat and species protection, enhancement, and restoration quantities cited in this table are from Volume II of the Ecosystem Restoration Program Plan (CALFED 2000). Habitat enhancement and restoration quantities are summarized by CALFED region in Table A-2.

[4] This species is fully protected by the State of California. The California Department of Fish and Game (CDFG) is prohibited from issuing permits for incidental take of fully protected species.

[5] CALFED actions must avoid direct mortality of the species (see MSCS Table 4-5). Project modifications could be necessary to avoid direct mortality.

Acronyms

CALFED	CALFED Bay-Delta Program
CDFG	California Department of Fish and Game
EMZ	ERP ecological management zone
ERP	Ecosystem Restoration Program
MSCS	Multi-Species Conservation Strategy
NCCP	Natural Community Conservation Plan

Citation

CALFED Bay-Delta Program. 2000. Ecosystem Restoration Program Plan, Volume II – Ecological Management Zone Visions. July. Sacramento, CA.

Table A-2. Summary of Natural Community Conservation Plan Habitat Acres to be Protected, Enhanced, or Restored under the Ecosystem Restoration Program

NCCP Habitat or Habitat Feature	CALFED Region							
	Delta		Bay		Sacramento River		San Joaquin River	
	Protected or Enhanced	Restored	Protected or Enhanced	Restored	Protected or Enhanced	Restored	Protected or Enhanced	Restored
Tidal perennial aquatic	0	7,500[1]	0	1,500	0	0	0	0
Lacustrine	0	0	0	1,600	0	0	0	0
Saline emergent	0	0	6,200	7,500-12,000	0	0	0	0
Tidal freshwater emergent[2]	0	30,200-45,800	0	0	0	0	0	0
Nontidal freshwater permanent emergent	0	19,600[3]	0	0	0	0	0	0
Managed seasonal wetland[4]	4,000	28,000	58,000	1,000-1,500	73,325	0	172,800	0
Natural seasonal wetland[5]	0	0	600-1,000[6]	0	0	0	0	0
Valley foothill riparian and montane riparian[7]	0	1,284-1,922	0	200-300	16,000-24,000[8]	3,635	1,000[8]	5,432-5,932
Grassland[9]	0	4,000-6,000	0	5,000	0	0	0	0[10]
Inland dune scrub	50-100	0	0	0	0	0	0	0
Seasonally flooded agriculture and upland cropland[11]	40,000-75,000	0	0	0	298,643	0	15,290	0
Tidal and delta sloughs[12]	0	395-970	0	213-423	0	303-606	0	0

Notes:

[1] Includes 500 acres of Ecosystem Restoration Program (ERP) designated shoal habitat.

[2] Includes 200-800 acres of ERP designated channel island habitat.

[3] Includes 2,600 acres of ERP designated nontidal perennial aquatic habitat (i.e., Multi-Species Conservation Strategy [MSCS] designated lacustrine).

[4] Designated as seasonal wetlands in the ERP.

[5] Designated as vernal pools in the ERP.

[6] Includes 100 acres of ERP designated vernal pool habitat and 500-1,000 acres of adjacent buffer lands.

[7] Designated as riparian and riverine aquatic in the ERP. The ERP plan identifies miles of streamside riparian habitat to be restored. Acreages of restored habitat are estimates developed by CALFED from miles of restored habitat identified in the ERP plan.

[8] Designated as the ecological process stream channel meander in the ERP. The ERP plan identifies miles of stream channel meander corridors along channels to be protected and enhanced. Acreages of protected and enhanced stream channel meander corridors are estimates developed by CALFED from miles of stream channel meander corridors identified as being protected or enhanced in the ERP plan. It is assumed that protection and enhancement of stream channel meander corridors will result in protection and enhancement of existing riparian habitat and will restore the processes that will allow natural reestablishment of riparian habitat.

[9] Designated perennial grassland in the ERP.

[10] The ERP identifies restoration of an unspecified amount of grassland in association with enhancement of seasonal wetlands in the Sacramento River Region.

[11] Designated as agricultural lands in the ERP.

[12] This ERP designated habitat is assumed to result in restoration of MSCS tidal perennial aquatic, saline emergent, tidal freshwater emergent, and valley/foothill riparian habitats. The extent of each of the MSCS habitats that would be restored is not estimated.

Acronyms:

ERP = Ecosystem Restoration Program

MSCS = Multi-Species Conservation Strategy
NCCP = Natural Community Conservation Plan

Sources:

CALFED Bay-Delta Program. Ecosystem Restoration Program Plan, Volume II– Ecological Management Zone Visions. Technical Appendix, Final Programmatic Environmental Impact Statement/Environmental Impact Report, July 2000. Sacramento, CA.

Mills, Terry. CALFED Ecosystem Restoration Program coordinator. Unpublished memorandum.

Table A-3. CALFED NCCP Covered Species

Common Name and Scientific Name	Status[1]		MSCS Species Goal[2]
	State	Federal	
Mammals			
Ringtail *Bassariscus astutus*	–	–	m
Riparian brush rabbit *Sylvilagus bachmani riparius*	CE	E	r
Salt-marsh harvest mouse *Reithrodontomys raviventris*	CE	E	r
San Joaquin Valley woodrat [Riparian woodrat] *Neotoma fuscipes riparia*	–	E	r
San Pablo California vole [San Pablo vole] *Microtus californicus sanpabloensis*	–	–	r
Suisun ornate shrew [Suisun shrew] *Sorex ornatus sinuosus*	–	–	R
Birds			
Aleutian Canada goose *Branta canadensis leucopareia*	–	T	m
American peregrine falcon *Falco peregrinus anatum*	CE	–	m
Bald eagle *Haliaeetus leucocephalus*	CE	T	m
Bank swallow *Riparia riparia*	CT	–	r
Black-crowned night heron (rookery) *Nycticorax nycticorax*	–	–	m
Black tern *Chlidonias niger*	–	–	m
California black rail *Laterallus jamaicensis coturniculus*	CT	–	r
California clapper rail *Rallus longirostris obsoletus*	CE	E	r
California gull *Larus californicus*	–	–	m
California yellow warbler [Yellow warbler] *Dendroica petechia brewsteri*	–	–	r
Cooper's hawk *Accipiter cooperi*	–	–	m
Double-crested cormorant (rookery) *Phalacrocorax auritus*	–	–	m
Great blue heron (rookery) *Ardea herodias*	–	–	m

Table A-3. CALFED NCCP Covered Species

Common Name and Scientific Name	Status[1] State	Status[1] Federal	MSCS Species Goal[2]
Birds Continued			
Great egret (rookery) *Ardea albus*	–	–	m
Greater sandhill crane *Grus canadensis tabida*	CT	–	r
Least Bell's vireo *Vireo bellii pusillus*	CE	E	r
Little willow flycatcher *Empidonax traillii brewsteri*	CE	–	r
Long-billed curlew *Numenius americanus*	–	–	m
Long-eared owl *Asio otus*	–	–	m
Northern harrier *Circus cyaneus*	–	–	m
Osprey *Pandion haliaetus*	–	–	m
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	–	–	r
San Pablo song sparrow [Samuel's song sparrow] *Melospiza melodia samuelis*	–	–	R
Short-eared owl *Asio flammeus*	–	–	m
Snowy egret (rookery) *Egretta thula*	–	–	m
Suisun song sparrow *Melospiza melodia maxillaris*	–	–	R
Swainson's hawk *Buteo swainsoni*	CT	–	r
Tricolored blackbird *Agelaius tricolor*	–	–	m
Western least bittern *Ixobrychus exilis hesperis*	–	–	m
Western snowy plover *Charadrius alexandrinus nivosus*	–	T	m
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	CE	–	r
White-faced ibis *Plegadis chihi*	–	–	m

Table A-3. CALFED NCCP Covered Species

Common Name and Scientific Name	Status[1] State	Status[1] Federal	MSCS Species Goal[2]
Birds Continued			
White-tailed kite *Elanus leucurus*	–	–	m
Yellow-breasted chat *Icteria virens*	–	–	m
Reptiles			
Giant garter snake *Thamnophis gigas*	CT	T	r
Western pond turtle *Clemmys marmorata*	–	–	m
Fishes			
Central Valley fall-/late-fall-run chinook salmon evolutionarily significant unit (ESU) *Oncorhynchus tshawytscha*	–	C	R
Central Valley spring-run chinook salmon ESU [Spring-run chinook salmon] *Oncorhynchus tshawytscha*	CT	T	R
Central Valley steelhead ESU *Oncorhynchus mykiss*	–	T	R
Delta smelt *Hypomesus transpacificus*	CT	T	R
Green sturgeon *Acipenser medirostris*	–	–	R
Longfin smelt *Spirinchus thaleichthys*	–	–	R
Sacramento perch *Archoplites interruptus*	–	–	r
Sacramento splittail *Pogonichthys macrolepidotus*	–	T	R
Sacramento River winter-run chinook salmon ESU [Winter-run chinook salmon] *Oncorhynchus tshawytsha*	CE	E	R
Invertebrates			
Delta green ground beetle *Elaphrus viridis*	–	T	r
Lange's metalmark [Lange's metalmark butterfly] *Apodemis mormo langei*	–	E	R
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	–	T	R

Table A-3. CALFED NCCP Covered Species

Common Name and Scientific Name	Status[1] State	Status[1] Federal	MSCS Species Goal[2]
Plants			
Suisun Marsh aster *Aster lentus*	–	–	R
Alkali milk-vetch *Astragalus tener* var. *tener*	–	–	r
Bristly sedge *Carex comosa*	–	–	r
Slough thistle *Cirsium crassicaule*	–	–	m
Suisun thistle *Cirsium hydrophilum* var. *hydrophilum*	–	E	R
Point Reyes bird's-beak *Cordylanthus maritimus* ssp. *palustris*	–	–	r
Soft bird's-beak *Cordylanthus mollis* ssp. *mollis*	R	E	R
Hispid bird's-beak *Cordylanthus mollis* ssp. *hispidus*	–	–	m
Silky cryptantha *Cryptantha crinita*	–	–	m
Delta coyote-thistle [Delta button-celery] *Eryngium racemosum*	CE	–	r
Contra Costa wallflower *Erysimum capitatum* ssp. *angustatum*	CE	E	R
Rose-mallow *Hibiscus lasiocarpus*	–	–	m
Carquinez goldenbush *Isocoma arguta*	–	–	m
Northern California black walnut (native stands) *Juglans hindsii*	–	–	r
Contra Costa goldfields *Lasthenia conjugens*	–	E	m
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	–	–	r
Heckard's pepper-grass *Lepidium latipes* var. *heckardii*	–	–	m
Mason's lilaeopsis *Lilaeopsis masonii*	R	–	R

Table A-3. CALFED NCCP Covered Species

Common Name and Scientific Name	Status[1] State	Status[1] Federal	MSCS Species Goal[2]
Plants Continued			
Delta mudwort *Limosella subulata*			r
Colusa grass *Neostapfia colusana*	CE	T	m
Antioch Dunes evening-primrose *Oenothera deltoides* ssp. *howellii*	CE	E	R
Marin knotweed *Polygonum marinense*	–	–	m
Eel-grass pondweed *Potamogeton zosteriformis*	–	–	m
Sanford's arrowhead *Sagittaria sanfordii*	–	–	m
Crampton's tuctoria [Solano grass] *Tuctoria mucronata*	CE	E	r

Note: California Department of Fish and Game common name designations shown in brackets.

[1]Status:

Federal

E = Listed as endangered under the federal Endangered Species Act (FESA).
T = Listed as threatened under FESA.
C = Candidate for listing under FESA.

State

CE = Listed as endangered under the California Endangered Species Act (CESA).
CT = Listed as threatened under CESA.
R = Listed as rare under California Native Plant Protection Act.

California Native Plant Society (CNPS)

1B = CNPS List 1B.
2 = CNPS List 2.
3 = CNPS List 3.

[2] **MSCS Species Goals:**

R = Recovery. Recover species' populations within the MSCS focus area to levels that ensure the species' long-term survival in nature.
r = Contribute to recovery. Implement some of the actions deemed necessary to recover species' populations within the MSCS focus area.
m = Maintain. Ensure that any adverse effects on the species that could be associated with implementation of CALFED actions will be fully offset through implementation of actions beneficial to the species.

Table A-4. CALFED MSCS-ERP Milestones

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Delta and East Side Tributaries		
Ecological Processes		
Develop a methodology for evaluating delta flow and hydrodynamic patterns and begin implementation of an ecologically based plan to restore conditions in the rivers and sloughs of the Delta sufficient to support targets for the restoration of aquatic resources.	Bay-Delta Hydrodynamics	Central Valley chinook salmon and steelhead, green sturgeon, delta smelt, longfin smelt, and Sacramento splittail
Develop and implement temperature management programs within major tributaries in the Eastside Delta Tributaries EMZ. The goal of the programs should be achievement of the ERP temperature targets for salmon and steelhead. The programs shall include provisions to: a) develop accurate and reliable water temperature prediction models; b) evaluate the use of minimum carryover storage levels and other operational tools; c) evaluate the use of new facilities such as temperature control devices; and d) recommend operational and/or physical facilities as a long-term solution.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead
Provide a fall or early winter outflow that emulates the first "winter" rain through the Delta.	Central Valley Streamflow	all Central Valley salmonids
Complete a fluvial geomorphic assessment of coarse sediment supply needs and sources to maintain, improve, or supplement gravel recruitment and natural sediment transport processes linked to stream channel maintenance, erosion and deposition, maintenance of fish spawning areas, and the regeneration of riparian vegetation. Develop and implement a program to reduce erosion and maintain gravel recruitment on at least one tributary within the Eastside Delta Tributaries EMZ.	Coarse Sediment Supply	all races of chinook salmon, steelhead, splittail, delta smelt, green sturgeon, bank swallow, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, valley elderberry longhorn beetle, Norther California black walnut

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop floodplain management plans, including feasiblility studies to construct setback levees, to restore and improve opportunities for rivers to inundate their floodplain on a seasonal basis for at least one tributary within the Eastside Delta Tributary EMZ.	Natural Floodplain and Flood Processes	all Central Valley salmonids, Sacramento splittail, delta smelt, longfin smelt, western yellow-billed cuckoo, California yellow warbler, Least Bell's vireo, San Joaquin Valley woodrat, Valley elderberry long-horn beetle, Northern California black walnut
Habitats		
In the Sacramento-San Joaquin Delta EMZ, cooperatively enhance at least 15% of the ERP target for wildlife friendly agricultural practices.	Agricultural Lands	greater sandhill crane, giant garter snake, Swainson's hawk
Restore a minimum of 15 miles of slough habitat (widths less than 50 to 75 feet) in each of the North, East, South, Central and West Delta EMUs that allows for the colonization of delta mudwort and delta tule pea.	Delta Sloughs	all Central Valley salmonids, delta smelt, Sacramento splittail, Sacramento perch, giant garter snake,delta mudwort, delta tule pea
Restore a minimum of 500, 250, 1,000, and 2,500 acres of nontidal emergent wetland in the North, East, South, and Central and West Delta Ecological Management units respectively. Establish at least one population of bristly sedge in each EMU.	Fresh Emergent Wetland (nontidal)	giant garter snake, California black rail, bristly sedge
Restore a minimum of 500, 500, 4,000, and 5,000 acres of tidal emergent wetland in the North, East, South, and Central and West Delta Ecological Management units respectively.	Fresh Emergent Wetland (tidal)	all Central Valley salmonids, green sturgeon, longfin smelt, delta smelt, Sacramento splittail, California black rail, Mason's lilaeopsis, delta mudwort, delta tule pea
Conduct surveys to locate potential habitat restoration sites capable of supporting Antioch dunes evening primrose, Contra Costa wallflower, and Lange's metalmark butterfly. Enhance 50 acres of low to moderate quality Antioch inland dune scrub habitat to support these species. Annually monitor establishment success.	Inland Dune Scrub	Lange's metalmark butterfly, Antioch dunes evening primrose, Contra Costa wallflower

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Restore a minimum of 125 acres of channel islands and 125 acres of shoals in the Delta.	Midchannel Islands and Shoals	all Central Valley salmonids, Sacramento splittail, delta smelt, black rail
Develop and implement a program to establish, restore, and maintain riparian habitat to improve floodplain habitat, salmonid shaded riverine aquatic habitat, and instream cover along at least one tributary within the Eastside Delta Tributary EMZ	Riparian and Riverine Aquatic Habitats	Central Valley steelhead, fall/late fall-run chinook salmon, western yellow-billed cuckoo, Valley elderberry long-horn beetle, riparian brush rabbit, California yellow warbler, Least Bell's vireo, little willow flycatcher, delta coyote thistle
Implement 25 percent of the ERP target for diverse, self-sustaining riparian community for each EMU in the Sacramento-San Joaquin Delta EMZ.	Riparian and Riverine Aquatic Habitats	Central Valley fall/late fall-run chinook salmon, steelhead, western yellow-billed cuckoo, little willow flycatcher, California yellow warbler
Restore a minimum of 300 acres of self-sustaining or managed diverse natural riparian habitat along the Mokelumne River, Cosumnes River, and Calaveras River and protect existing riparian habitat.	Riparian and Riverine Aquatic Habitats	Central Valley fall/late fall-run chinook salmon, steelhead, western yellow-billed cuckoo, little willow flycatcher, California yellow warbler, Valley elderberry long-horn beetle
Enhance, protect and restore 1,000 to 1,500 acres of seasonal wetlands in the East Delta EMU for optimum greater sandhill crane habitat.	Seasonal Wetlands	greater sandhill crane, Swainson's hawk
Restore a minimum of 500, 250, 500, and 750 acres of tidal perennial aquatic habitat in the North, East, South, and Cental and West Delta Ecological Management units respectively.	Tidal Perennial Aquatic Habitat	all Central Valley salmonids, delta smelt, Sacramento splittail, longfin smelt, green sturgeon
Stressors Reduction		
Develop and implement a program to address inadequate instream flows for steelhead and chinook salmon on streams within Eastside Delta tributaries. Where appropriate provide adequate flows for Sacramento splittail and green sturgeon.	Dams and Other Structures	steelhead, fall/late fall-run chinook salmon, green sturgeon, Sacramento splittail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Provide unimpeded upstream and downstream passage for salmon and steelhead on Eastside Delta tributaries.	Dams and Other Structures	all Central Valley salmonids
Assist in the development and implementation of a black and clapper rail impact reduction program.	Disturbance	California black rail, California clapper rail
Develop and begin implementation of a program to reduce or eliminate the influx of non-native aquatic species in ship ballast water.	Invasive Aquatic Organisms	all covered fish species
Complete installation of fish passage facilities at Bellota Weir, Clements Dam, and Cherryland Dam on the Calaveras River and provide passage flows.	Dams and Other Structures	Central Valley fall/late fall-run chinook salmon and steelhead
Develop and begin implemention of a demonstration program to reduce invasive non-native plant abundance within at least one EMU in the Delta.	Invasive Aquatic Plants	Susiun Marsh aster, Mason's lilaeopsis, delta mudwort, delta tule pea
Implement a program to improve fish passage and reduce predation on juvenile salmonids below Woodbridge Dam on the lower Mokelumne River that includes the following elements: (1) improving the form and function of the stream channel; (2) rebuilding the Woodbridge Dam fish passage and diversion screening facilities to minimize losses of downstream migrating salmon and steelhead; and (3) improving the fish bypass discharge.	Predation and Competition	Central Valley fall/late fall-run chinook salmon, steelhead
Consolidate and screen 50 small agricultural diversions in the Delta, prioritized according to size, location, and season of operation.	Water Diversions	all R and r covered fish
Upgrade screens at Southern Energy's Contra Costa power plants with screens acceptable to the Fish and Wildlife Agencies.	Water Diversions	all R and r covered fish

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Actions to minimize or eliminate low dissolved oxygen conditions (DO sag) in lower San Joaquin River near Stockton (from Phase II Report): • Complete studies of causes for DO sag in San Joaquin River near Stockton. • Define and implement corrective measures for DO sag. • Finalization of investigation of methods to reduce constituents that cause low DO for inclusion in total maximun daily load (TMDL) recommendation by the Central Valley RWQCB. • Finalization of Basin Plan Amendment and TMDL for constituents that cause low DO in the San Joaquin River. • Implement appropriate source and other controls and other management practices, as recommended in the TMDL, to reduce anthropogenic oxygen depleting substances loadings and minimize or eliminate low DO conditions.	dissolved oxygen, oxygen depleting substances, nutrients, total organic carbon (TOC)	Salmonids, delta smelt, Sacramento splittail, longfin smelt, green sturgeon
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report)	oxygen depleting substances, nutrients, TOC, ammonia	Salmonids, Sacramento splittail
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	turbidity/ sedimentation	Salmonids
Conduct the necessary research to determine no adverse ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following mercury evaluation and abatement work in the Cache Creek watershed (from Phase II Report): • Support development and implementation of TMDL for mercury. • Determine bioaccumulation effects in creek and Delta. • Source, transport, inventory, mapping and speciation of mercury. • Participate in Stage 1 remediation (drainage control) of mercury mines as appropriate. • Determine sources of high levels of bioavailable mercury	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake
Conduct the following mercury evaluation and abatement work in the Delta (from Phase II Report): • Determine methylization (part of bioaccumulation) process in Delta. • Determine sediment mercury concentration in areas that would be dredged during levee maintenance or conveyance work. • Determine potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon. • Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.
Conduct the following selenium work: • Conduct selenium research to fill data gaps in order to refine regulatory goals of source control actions; determine bioavailability of selenium under several scenarios (from Phase II Report). • Evaluate and, if appropriate, implement real-time management of selenium discharges (from Phase II Report). • Expand and implement source control, treatment, and reuse programs (from Phase II Report). • Coordinate with other programs; e.g., recommendations of San Joaquin Valley Drainage Implementation Program, CVPIA for retirement of lands with drainage problems that are not subject to correction in other ways (from Phase II Report). • Support development and implementation of TMDL for selenium in the San Joaquin River watershed (focus on Grassland area).	selenium	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper. • Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon
Suisun Marsh and North San Francisco Bay		
Habitats		
Restore and maintain a minimum of three linear miles of riparian habitat along corridors of existing riparian scrub and shrub vegetation in each of the Ecological Management Units of the Suisun Marsh/North San Francisco Bay Ecological Management Zone.	Riparian and Riverine Aquatic Habitats	Sacramento splittail, all Central Valley salmonids, Valley elderberry long-horn beetle, riparian brush rabbit, California yellow warbler, Least Bell's vireo, little willow flycatcher

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
In the Suisun Marsh/North San Francisco Bay EMZ, restore a minimum of 7,000 acres of Saline Emergent Wetland by restoring tidal action in the Suisun Bay and Marsh Ecological Management Unit (including 200 acres of muted tidal marsh along the Contra Costa shoreline) and a cumulative total of 1,000 acres in the Napa River, Sonoma Creek, Petaluma River, and San Pablo Bay Ecological Management Units. Restore high marsh and high-marsh upland transition habitat in conjunction with restoration of saline emergent wetland. Develop cooperative programs to acquire, in fee-title or through a conservation easement, the land needed for tidal restoration, and complete the needed steps to restore the wetlands to tidal action. Begin aggressive program of control of non-native plant species that are threatening the known populations of Suisun thistle, Suisun Marsh aster, soft bird's beak, and Point Reyes bird's beak. - Bring into protection at least 25% of currently occupied, but unprotected Suisun Marsh aster habitat, spread throughout the North, East, South Delta and Napa River Ecological Units, and ensure appropriate management. -Expand suitable tidal slough habitat for Suisun Marsh aster by 25 linear miles. -Identify at least three protected and managed sites for introduction of at least three additional populations of Suisun thistle; increase overall population size at least threefold. -Establish at least one new population of soft bird's beak with high likelihood of success in restored habitat in each of the Suisun Bay and Marsh EMU, the Napa River EMU, and the Petaluma River EMU. -Establish at least one new Point Reyes bird's beak population in the Petaluma River and San Pablo Bay EMUs.	Saline Emergent Wetland	All Central Valley salmonids, delta smelt, longfin smelt, Sacramento splittail, Suisun song sparrow, San Pablo song sparrow, California Clapper rail, California black rail, Suisun thistle, soft bird's beak, Point Reyes bird's-beak, salt marsh harvest mouse, Suisun ornate shrew, San Pablo California vole, Suisun aster, salt marsh common yellow throat

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Restore suitable, occupied slough edge habitat for delta mudwort and delta tule pea by at least 5 miles in the Suisun Bay and Marsh EMU and by at least 10 miles in the Napa River EMUs. Bring at least 25% the currently existing but unprotected occurrences of delta mudwort and delta tule into protection through purchase or conservation agreement, and ensure appropriate management.	Saline Emergent Wetland	all Central Valley salmonids, delta smelt, Sacramento splittail, California black rail, Mason's lilaeopsis, delta mudwort, delta tule pea
In the Suisun Marsh/North San Francisco Bay Ecological Management Zone, restore and manage a minimum of 500 acres of seasonal wetland, and improve management of a minimum of 7,000 acres of existing, degraded seasonal wetland in a manner that provides suitable habitat for salt marsh harvest mouse, San Pablo California vole, and Suisun ornate shrew.	Seasonal Wetlands	salt marsh harvest mouse, San Pablo California vole, Suisun ornate shrew
Restore a minimum of 400 acres of tidal perennial aquatic habitat in the Suisun Marsh/North San Francisco Bay Ecological Management Zone.	Tidal Perennial Aquatic Habitat	all Central Valley salmonids, delta smelt, Sacramento splittail, longfin smelt

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop a cooperative program to acquire, manage and restore 100 acres of vernal pools and 500 to 1,000 acres of adjacent buffer areas in the Suisun Marsh/North San Francisco Bay EMZ. Protect all existing known occurrences of Crampton's tuctoria through conservation easement or purchase from willing sellers (including CNDDB Element Occurrence #2 and any new populations that are found). Identify at least two protected and managed sites for introduction of additional populations; begin introduction and monitor for success. Manage at least 250 acres of the ERP target for vernal pools near the Jepson Prairie preserve as suitable habitat for alkali milk vetch. Establish new populations on protected and appropriately managed lands. Bring 50% of currently unprotected, existing populations into protection through purchase or conservation agreement, and ensure appropriate management.	Vernal Pools	Delta green ground beetle, Crampton's tuctoria, Alkali milk- vetch
Stressors Reduction		
Develop a program to consolidate, screen, or eliminate 25% of the unscreened diversions in Suisun Marsh.	Water Diversions	all R and r covered fish
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report)	oxygen depleting substances, nutrients, TOC, ammonia	Salmonids, Sacramento splittail
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	turbidity/ sedimentation	Salmonids
Conduct the necessary research to determine no adverse ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon. • Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following selenium work: • Conduct selenium research to fill data gaps in order to refine regulatory goals of source control actions; determine bioavailability of selenium under several scenarios (from Phase II Report). • Evaluate and, if appropriate, implement real-time management of selenium discharges (from Phase II Report). • Expand and implement source control, treatment, and reuse programs (from Phase II Report). • Coordinate with other programs; e.g., recommendations of San Joaquin Valley Drainage Implementation Program, CVPIA for retirement of lands with drainage problems that are not subject to correction in other ways (from Phase II Report). • Support development and implementation of TMDL for selenium in the San Joaquin River watershed (focus on Grassland area).	selenium	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper. • Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Sacramento River Basin		
Ecological Processes		
Construct a network of channels totaling 20 miles within the Sutter and Yolo Bypasses that effectively drains flooded lands after floodflows stop entering the bypasses. The channels should be designed to allow juvenile anadromous and resident fish to move from rearing and migratory areas. Develop and begin implementation of a program in the Yolo Basin to restore channel-floodplain connectivity and floodplain processes. Design natural stream channel configurations and expand floodplain overflow areas in the lower Cache and Putah Creek floodplains, as well as in channels and sloughs of the upper Yolo Bypass to provide connections with the Delta in a manner consistent with flood control requirements. Diversions (water source) into the Yolo Basin should not result in direct or indirect adverse impacts to salmonids. Project design features would include sloughs and creek channels, setback levees, and wetlands, where feasible and consistent with flood protection.	Natural Floodplain and Flood Processes	Central Valley chinook salmon and steelhead, Sacramento splittail
Develop and implement temperature management programs within major tributaries in the Sacramento River Basin. The goal of the programs should be achievement of the ERP temperature targets for salmon and steelhead. The programs shall include provisions to: a) develop accurate and reliable water temperature prediction models; b) evaluate the use of minimum carryover storage levels and other operational tools; c) evaluate the use of new facilities such as temperature control devices; and d) recommend operational and/or physical facilities as a long-term solution.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop and implement a program to address the thermal impacts of irrigation return flows in the Sacramento River Basin. The goal of the program should be achieve Basin Plan objectives for water temperature. The program should include provisions to: a) identify locations of irrigation return flows with thermal impacts; b) develop measures to avoid or eliminate thermal impacts from irrigation return flows; and c) prioritize problem sites based on impacts to chinook salmon and steelhead. If feasible, proceed with implementation of some or all actions to address thermal impacts of irrigation return flows.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead
Design and begin implementation of an ecologically based streamflow regulation plan for Yuba River, Butte Creek, Big Chico Creek, Deer Creek, Mill Creek , Antelope Creek, Battle Creek, Cottonwood Creek, and Clear Creek.	Central Valley Streamflow	all Central Valley salmonids, green sturgeon, Sacramento splittail, western yellow-billed cuckoo, yellow warbler, Least Bell's vireo
Complete a fluvial geomorphic assessment of coarse sediment supply needs and sources to maintain, improve, or supplement gravel recruitment and natural sediment transport processes linked to stream channel maintenance, erosion and deposition, maintenance of fish spawning areas, and the regeneration of riparian vegetation. Develop and implement a program to reduce erosion and maintain gravel recruitment on at least one tributary within each EMZ in the Sacramento River Basin.	Coarse Sediment Supply	all races of chinook salmon, steelhead, splittail, delta smelt, green sturgeon, bank swallow, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, valley elderberry longhorn beetle, Norther California black walnut
Develop floodplain management plans, including feasiblility studies to construct setback levees, to restore and improve opportunities for rivers to inundate their floodplain on a seasonal basis for at least one tributary within each of the EMZs in the Sacramento River Basin. Among the areas to be included are the lower 10 miles of Clear Creek, Antelope Creek, and Deer Creek, and the lower reach of Cottonwood Creek.	Natural Floodplain and Flood Processes	all Central Valley salmonids, Sacramento splittail, delta smelt, longfin smelt, western yellow-billed cuckoo, California yellow warbler, Least Bell's vireo, San Joaquin Valley woodrat, Valley elderberry long-horn beetle, Northern California black walnut

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Protect 15,000 acres within the Inner River Zone areas between Red Bluff and Colusa reaches within identified the Sacramento River Conservation Area. Establish between 3 and 5 habitat preserves for bank swallows along the upper reaches of the Sacramento River capable of supporting 5000 bank swallow burrows between the towns of Colusa and Red Bluff.	Stream Meander	all Central Valley salmonids, steelhead, western yellow-billed cuckoo, Least Bell's vireo, Swainson's hawk, Valley elderberry longhorn beetle, bank swallow
Habitats		
In the American River Basin, Butte Basin, Colusa Basin, Feather River/Sutter Basin EMZs, cooperatively enhance at least 15 to 25% of the ERPP target for wildlife friendly agricultural practices.	Agricultural Lands	greater sandhill crane, giant garter snake, Swainson's hawk
Develop and implement a program to establish, restore, and maintain riparian habitat to improve floodplain habitat, salmonid shaded riverine aquatic habitat, and instream cover along at least one tributary within each of the following Ecological Management Zones: American River Basin, Butte Basin, Colusa Basin, Cottonwood Creek, Feather River/Sutter Basin, North Sacramento Valley, Sacramento River, and Yolo Basin. While restoring habitat conditions in the American River EMZ, maintain continuous corridors of suitable riparian habitat for valley elderberry longhorn beetle. Protect existing known occurrences of northern California black walnut native stands through conservation easement or purchase. Identify at least 3 protected and managed sites for introduction of additional populations of northern California black walnut; begin introduction and monitor for success. Population creation should be part of a broader effort to restore riparian areas which historically contained walnut.	Riparian and Riverine Aquatic Habitats	all Central Valley salmonids, western yellow-billed cuckoo, Valley elderberry long-horn beetle, California yellow warbler, Least Bell's vireo, little willow flycatcher

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
In the Cottonwood Creek EMZ, complete (1) long-term agreements with local landowners to establish, restore, and maintain riparian communities along 25 percent of the upper and 25 percent of the lower reaches of Cottonwood Creek, and (2) the development of a comprehensive watershed management plan that supports local land use decisions to protect existing riparian and restore lost riparian.	Riparian and Riverine Aquatic Habitats	all Central Valley salmonids, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, little willow flycatcher
Restore 2 miles of the 10 mile target of riparian habitat restoration along the lower reaches of each of the following tributaries: Battle, Clear, Deer, Mill, Butte, Big Chico, Antelope, Feather, Yuba, and Bear Rivers.	Riparian and Riverine Aquatic Habitats	all Central Valley salmonids, California yellow warbler, western yellow-billed cuckoo, little willow flycatcher, Least Bell's vireo, Valley elderberry long-horn beetle
Implement 25 percent of the ERP target for enhancing, protecting, and restoring seasonal wetlands in the following EMZs: American River Basin, Butte Basin, Colusa Basin, and Feather River/Sutter Basin.	Seasonal Wetlands	greater sandhill crane, Swainson's hawk, giant garter snake
Stressors Reduction		
Develop and implement a program to address inadequate instream flows for steelhead and chinook salmon on streams within Sacramento River Basin tributaries. Where appropriate provide adequate flows for Sacramento splittail and green sturgeon.	Dams and Other Structures	all Central Valley salmonids, green sturgeon, Sacramento splittail
Provide unimpeded upstream and downstream passage for salmon and steelhead on Sacramento River Basin tributaries.	Dams and Other Structures	all Central Valley salmonids, green sturgeon, Sacramento splittail
On Big Chico Creek, repair the Lindo Channel weir and fishway at the Lindo Channel box culvert at the Five Mile Diversion to improve upstream fish passage.	Dams and Other Structures	all Central Valley salmonids
Develop and implement a solution to improve passage of upstream migrant adult fish and downstream migrant juvenile fish Battle Creek.	Dams and Other Structures	all Central Valley salmonids, green sturgeon

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Evaluate the feasibility of constructing fish passage facilities at the Grays Bend-Old River-Freemont weir complex at the upper end of the Yolo Bypass.	Dams and Other Structures	all Central Valley salmonids
Develop a program to reduce or eliminate fish stranding in the Sacramento, Feather and Yuba rivers and the Colusa Basin drain and Sutter Bypass in the active stream channels, floodplains, shallow ponds and borrow areas. Develop protocols for ramping flow reductions. Conduct surveys of stranding under a range of flow conditions and recommend solutions.	Stranding	all Central Valley salmonids, green sturgeon, longfin smelt, Sacramento splittail
Install positive barrier fish screens on all diversions greater than 250 cfs in all EMZs and 25% of all smaller unscreened diversions in the Sacramento River Basin. Among those diversions to be screened are the DWR Pumping Plants and 50% of small diversion located on east side of Sutter Bypass, the Bella Vista diversion in the upper Sacramento River near Redding, East-West Diversion Weir, Weir 5, Weir 3, Guisti Weir and Weir 1 in the Sutter Bypass, White Mallard Dam, Morton Weir, Drivers Cut Outfall and Colusa Shooting/Tarke Weir Outfall and associated diversion screens in the Butte Sink..	Water Diversions	all R and r covered fish
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report)	oxygen depleting substances, nutrients, TOC, ammonia	Salmonids, Sacramento splittail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Actions to minimize or eliminate inter-substrate low dissolved oxygen conditions in salmonid spawning and rearing habitat, especially in the Mokelumne, Cosumnes, American, Merced, Tuolumne, and Stanislaus Rivers (from Phase II Report and Water Quality Program Plan): • Develop inter-substrate DO testing for salmonid spawning and rearing habitat. • Conduct comprehensive surveys to assess the extent and severity of inter-substrate low DO conditions. • Develop and begin implementing appropriate best management practices (BMPs), including reducing anthropogenic fine sediment loads, to minimize or eliminate inter-substrate low DO conditions.	dissolved oxygen, turbidity/ sedimentation	Salmonids
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	turbidity/ sedimentation	Salmonids
Conduct the necessary research to determine no adverse ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following mercury evaluation and abatement work in the Cache Creek watershed (from Phase II Report): • Support development and implementation of TMDL for mercury. • Determine bioaccumulation effects in creek and Delta. • Source, transport, inventory, mapping and speciation of mercury. • Participate in Stage 1 remediation (drainage control) of mercury mines as appropriate. • Determine sources of high levels of bioavailable mercury	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake
Conduct the following mercury evaluation and abatement work in the Sacramento River (from Phase II Report): • Determine, inventory, and sources of high levels of bioavailable mercury • Refine mercury models. • Participate in remedial activities.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon. • Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper. • Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon
San Joaquin River Basin		
Ecological Processes		
Develop and implement temperature management programs within major tributaries in the San Joaquin River Basin. The goal of the programs should be achievement of the ERP temperature targets for salmon and steelhead. The programs shall include provisions to: a) develop accurate and reliable water temperature prediction models; b) evaluate the use of minimum carryover storage levels and other operational tools; c) evaluate the use of new facilities such as temperature control devices; and d) recommend operational and/or physical facilities as a long-term solution.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop and implement a program to address the thermal impacts of irrigation return flows in the San Joaquin River Basin. The goal of the program should be achieve Basin Plan objectives for water temperature. The program should include provisions to: a) identify locations of irrigation return flows with thermal impacts; b) develop measures to avoid or eliminate thermal impacts from irrigation return flows; and c) prioritize problem sites based on impacts to chinook salmon and steelhead. If feasible, proceed with implementation of some or all actions to address thermal impacts of irrigation return flows.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead
Complete a fluvial geomorphic assessment of coarse sediment supply needs and sources to maintain, improve, or supplement gravel recruitment and natural sediment transport processes linked to stream channel maintenance, erosion and deposition, maintenance of fish spawning areas, and the regeneration of riparian vegetation. Develop and implement a program to reduce erosion and maintain gravel recruitment on at least one tributary within each EMZ within the San Joaquin River Basin. In the East San Joaquin Basin EMZ, complete fluvial geomorphic assessments on all tributaries.	Coarse Sediment Supply	all races of chinook salmon, steelhead, splittail, delta smelt, green sturgeon, bank swallow, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, valley elderberry longhorn beetle, Northern California black walnut
Develop floodplain management plans, including feasibility studies to construct setback levees, to restore and improve opportunities for rivers to inundate their floodplain on a seasonal basis for at least one tributary within each of the EMZs in the San Joaquin River Basin. Among the areas to be included are at least 10 miles of stream channel in the West San Joaquin EMZ.	Natural Floodplain and Flood Processes	all Central Valley salmonids, Sacramento splittail, delta smelt, longfin smelt, western yellow-billed cuckoo, California yellow warbler, Least Bell's vireo, San Joaquin Valley woodrat, Valley elderberry long-horn beetle, Northern California black walnut

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop a cooperative program to restore salmonid spawning and rearing habitat in the Tuolumne, Stanislaus, and Merced Rivers that includes the following elements: (1) reconstructing channels at selected sites by isolating or filling in inchannel gravel extraction areas; (2) increasing natural meander by removing riprap and relocating other structures that impair stream meander; and (3) restoring more natural channel configurations to reduce salmonid predator habitat and improve migration corridors.	Stream Meander (also Predation and Competition)	Central Valley fall/late fall-run chinook salmon, steelhead, western yellow-billed cuckoo, California yellow warbler, bank swallow
Restore and maintain a defined stream-meander zone and increase floodplain habitat on the San Joaquin River between Vernalis and the mouth of the Merced River.	Stream Meander	Sacramento splittail, Central Valley fall/late fall-run chinook salmon, steelhead, bank swallow
Establish a river meander corridor between the Chowchilla Bypass and Mendota Pool to expand the floodway corridor to convey increased anticipated floodflows and restore floodplain habitat.	Stream Meander	Sacramento splittail, Central Valley fall/late fall-run chinook salmon, steelhead, bank swallow
Habitats		
In the San Joaquin River and West San Joaquin Basin EMZs, cooperatively enhance at least 15 to 25% of the ERPP target for wildlife friendly agricultural practices	Agricultural Lands	Swainson's hawk, greater sandhill crane, giant garter snake
In the West San Joaquin Basin EMZ, restoring or create 100 acres of fresh emergent wetland habitat.	Fresh Emergent Wetland	giant garter snake
In the West San Joaquin Basin EMZ, restore or enhance 1,000 acres of perennial grassland associated with existing or proposed wildlife corridors, wetlands, or floodplain habitats.	Perennial Grasslands	Swainson's hawk, greater sandhill crane

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop and implement a program to establish, restore, and maintain riparian habitat to improve floodplain habitat, salmonid shaded riverine aquatic habitat and instream cover along at least one tributary within the East San Joaquin and San Joaquin River EMZs.	Riparian and Riverine Aquatic Habitats	Central Valley steelhead, fall/late fall-run chinook salmon, western yellow-billed cuckoo, Valley elderberry long-horn beetle, riparian brush rabbit, California yellow warbler, Least Bell's vireo, little willow flycatcher, delta coyote thistle
Implement 25 percent of the ERP target for diverse, self-sustaining riparian community for all EMZs in the San Joaquin River Basin. Bring at least three of the currently existing but unprotected delta coyote thistle occurrences into protection through purchase or conservation agreement, and ensure appropriate management. Increase suitable habitat for delta coyote thistle by at least 20% and the number of populations and individuals by at least 10% through habitat management and protection. Establish two new riparian brush rabbit habitat preserves within the historical range of the species. Protect and enhance a minimum of 150 contiguous acres of mature, shrub-rich riparian forest and associated highwater refugia on the San Joaquin River, between the Merced River confluence and Vernalis, and on each of the east-side tributaries (the Stanislaus, Tuolumne and Merced rivers) for habitat values and as potential riparian brush rabbit re-introduction sites.	Riparian and Riverine Aquatic Habitats	San Joaquin Valley woodrat, delta coyote thistle, western yellow-billed cuckoo, Valley elderberry long-horn beetle, riparian brush rabbit

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Stressors Reduction		
Develop and implement a program to address inadequate instream flows for steelhead and chinook salmon on streams within San Joaquin River tributaries. Where appropriate provide adequate flows for Sacramento splittail and green sturgeon.	Dams and Other Structures	steelhead, fall/late fall-run chinook salmon, green sturgeon, Sacramento splittail
Provide unimpeded upstream and downstream passage for salmon and steelhead on San Joaquin River Basin tributaries.	Dams and Other Structures	steelhead, fall/late fall-run chinook salmon
Initiate a feasibility study of restoring steelhead migration into upper watershed areas (e.g., upstream of major low-elevation dams) in at least one San Joaquin River Basin EMZ Tributary.	Dams and Other Structures	steelhead
Install positive barrier fish screens on all diversions greater than 250 cfs in all EMZs and 25% of all smaller unscreened diversions in the San Joaquin River Basin. Among those diversions to be screened are the El Solyo, Patterson, and West Stanislaus irrigation district diversions.	Water Diversions	all R and r covered fish

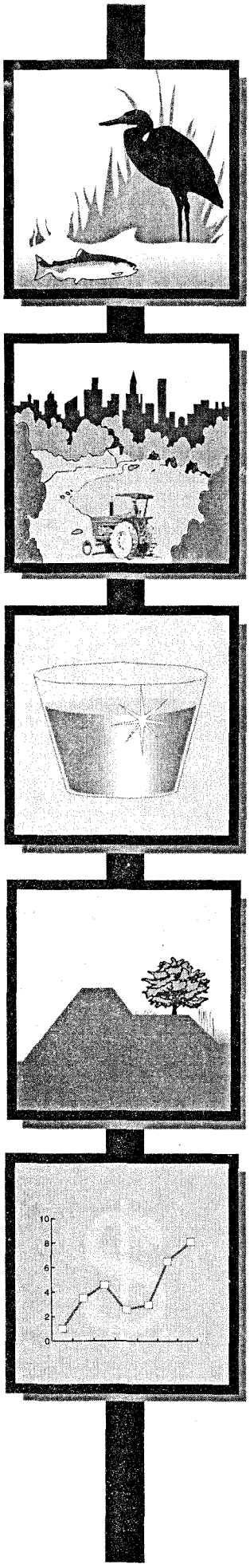
Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Actions to minimize or eliminate low dissolved oxygen conditions (DO sag) in lower San Joaquin River near Stockton (from Phase II Report): • Complete studies of causes for DO sag in San Joaquin River near Stockton. • Define and implement corrective measures for DO sag. • Finalization of investigation of methods to reduce constituents that cause low DO for inclusion in total maximun daily load (TMDL) recommendation by the Central Valley RWQCB. • Finalization of Basin Plan Amendment and TMDL for constituents that cause low DO in the San Joaquin River. • Implement appropriate source and other controls and other management practices, as recommended in the TMDL, to reduce anthropogenic oxygen depleting substances loadings and minimize or eliminate low DO conditions.	dissolved oxygen, oxygen depleting substances, nutrients, total organic carbon (TOC)	Salmonids, delta smelt, Sacramento splittail, longfin smelt, green sturgeon
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report)	oxygen depleting substances, nutrients, TOC, ammonia	Salmonids, Sacramento splittail
Actions to minimize or eliminate inter-substrate low dissolved oxygen conditions in salmonid spawning and rearing habitat, especially in the Mokelumne, Cosumnes, American, Merced, Tuolumne, and Stanislaus Rivers (from Phase II Report and Water Quality Program Plan): • Develop inter-substrate DO testing for salmonid spawning and rearing habitat. • Conduct comprehensive surveys to assess the extent and severity of inter-substrate low DO conditions. • Develop and begin implementing appropriate best management practices (BMPs), including reducing anthropogenic fine sediment loads, to minimize or eliminate inter-substrate low DO conditions.	dissolved oxygen, turbidity/ sedimentation	Salmonids

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Assess the ecological effects of low DO conditions in Suisun Marsh due to adding oxygen-depleted water from anthropogenic sources (from Water Quality Program Plan).	dissolved oxygen, oxygen depleting substances, nutrients, TOC	Delta smelt, Sacramento splittail, longfin smelt, salmonids, green sturgeon
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	turbidity/ sedimentation	Salmonids
Conduct the necessary research to determine no adverse ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon. • Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following selenium work: • Conduct selenium research to fill data gaps in order to refine regulatory goals of source control actions; determine bioavailability of selenium under several scenarios (from Phase II Report). • Evaluate and, if appropriate, implement real-time management of selenium discharges (from Phase II Report). • Expand and implement source control, treatment, and reuse programs (from Phase II Report). • Coordinate with other programs; e.g., recommendations of San Joaquin Valley Drainage Implementation Program, CVPIA for retirement of lands with drainage problems that are not subject to correction in other ways (from Phase II Report). • Support development and implementation of TMDL for selenium in the San Joaquin River watershed (focus on Grassland area).	selenium	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper. • Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon
Research Milestones		
Develop and implement a comprehensive monitoring, assessment and research program (CMARP) for terrestrial and aquatic habitats and species populations acceptable to the fish and wildlife agencies. Conduct rangewide surveys for all "R" and "r" covered plants and animals in the MSCS Focus Area.		
Develop and begin implementation of a study to determine appropriate conditions for the germination and establishment of riparian woody plants along the Sacramento River and San Joaquin River. Complete development of a cooperative program to plant vegetation on unvegetated riprapped banks consistent with flood control requirements.		

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct a study to investigate the effects of the road through Olcott Lake on vernal pool hydrology and impacts on vernal pool species.		
Conduct instream flow studies to determine the flows necessary to support all life stages of anadromous and estuarine fish species.		
Conduct an investigation of in-channel structures that focuses on the following issues: (1) habitat suitability for both predator and prey fishes; (2) predator-prey interactions; and (3) recommendations for reducing predation on juvenile salmonids.		
Conduct experimental introductions of Sacramento perch into nontidal perennial aquatic habitats		
Assess the impact of hatchery practices on naturally spawning populations of chinook salmon and steelhead and operate hatcheries in a manner consistent with safe genetic practices that will maintain genetic integrity of all Central Valley anadromous salmonid populations.		
Through the use of existing, expanded, and new programs, monitor adult anadromous salmonid returns to each watershed within the MSCS focus area. Monitoring techniques, data compilation and analysis, and reporting should be standardized among researchers and watersheds to the greatest extent possible.		



CALFED
BAY-DELTA
PROGRAM

Attachment 8
Clean Water Act Section 401
Memorandum of Understanding

August 28, 2000

MEMORANDUM OF UNDERSTANDING
ON CLEAN WATER ACT SECTION 401
FOR THE CALFED BAY-DELTA PROGRAM

RECITALS

These recitals provide background and context for the Memorandum of Understanding (401 MOU) that follows.

A. In 1994, the Governor's Water Policy Council of the State of California and the Federal Ecosystem Directorate entered into a Framework Agreement to establish a comprehensive program for coordination and communication with respect to environmental protection and water supply dependability in the Bay-Delta Estuary. This Framework Agreement served as the basis for the CALFED Bay-Delta Program.

B. The mission of the CALFED Bay-Delta Program is to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The CALFED Bay-Delta Program is also guided by solution principles adopted by CALFED agencies. According to the solution principles, a successful Bay-Delta solution must reduce conflicts in the system, be equitable, be affordable, be durable, be implementable, and have no significant redirected impacts.

C. To achieve its purposes, the CALFED Bay-Delta Program has developed eight broad programs as elements of the CALFED Preferred Program Alternative. These program elements are:

1. Ecosystem Restoration Program
2. Levee System Integrity Program
3. Storage
4. Conveyance
5. Water Use Efficiency Program
6. Water Quality Program
7. Water Transfer Program
8. Watershed Program

D. The CALFED Bay-Delta Program seeks to initiate implementation of its Preferred Program Alternative after execution of a Record of Decision and Certification pursuant to NEPA and CEQA. The 30-year implementation period following the Record of Decision and Certification is referred to as Phase III of the Program. The CALFED Bay-Delta Program has defined the first seven years after execution of a Record of Decision and Certification as Stage 1 of Phase III.

E. The CALFED Program includes activities that may result in a discharge into waters of the United States.

F. The Clean Water Act (Act) establishes a goal of restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters. Under Section 401 of the Act, applicants for Federal licenses or permits for activities that may result in a discharge into waters of the United States must first obtain a certification from the state in which the discharge would originate. The certification must verify that the discharge will comply with the applicable effluent limitations, State water quality standards and other appropriate requirements. A certification for the construction of a facility must also cover the operation of the facility. The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) issue water quality certifications pursuant to Section 401 of the Act, pursuant to Water Code section 13160, and pursuant to California Code of Regulations, title 23, sections 3830-3869. Applications for 401 certifications are filed in the manner set forth in California Code of Regulations, title 23, section 3855[1].

G. Section 401 certification is not required for the selection of the Preferred Program Alternative, but may be required prior to implementing individual components of the Preferred Program Alternative. An applicant must provide the materials specified in California Code of Regulations, title 23, section 3856 to the Executive Officer of a RWQCB or to the Executive Director of the SWRCB.

H. The SWRCB or the RWQCB, as provided in California Code of Regulations, title 23, sections 3855-3861, may issue certification or deny certification.

I. DEFINITIONS

Signatories are CALFED agencies that have executed this Understanding. Signatories include the U.S. Bureau of Reclamation, the State Water Resources Control Board , the Regional Water Quality Control Boards for the Central Valley Region and the San Francisco Bay Region, the California Department of Water Resources and the California Department of Fish and Game.

Stage 1 Actions are those CALFED Actions that have been designated by the CALFED Policy Group, or its successor, to begin implementation during the seven-year period immediately following execution of the Record of Decision and Certification of the Final Programmatic Environmental Impact Statement and Environmental Impact Report (EIS/EIR) for the CALFED Bay-Delta Program.

Phase II is the period of time during which the CALFED agencies developed a Preferred Program Alternative, conducted comprehensive environmental review, and developed a plan for implementing the Preferred Program Alternative. Phase II concludes with the filing of a Record of Decision and Certification of the Final Programmatic EIS/EIR.

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[1] For example, applications for 401 certification are typically filed with the RWQCB executive officer in whose region a discharge may occur, except that 401 applications are filed with the executive director of the SWRCB for projects that involve (1) multiple RWQCBs (2) application for water rights or other diversions of water for beneficial use or (3) requests to the Federal Energy Regulatory Commission for licenses or amendments to licenses.

Phase III refers to the period of time following the Record of Decision and Certification through the 30-year planning horizon used in developing the CALFED plan. Phase III will include site-specific environmental review and permitting.

II. UNDERSTANDING

A. The Signatories acknowledge that individual CALFED Program activities in Phase III must be consistent with Clean Water Act section 401.

B. The Signatories recognize the integrated nature of the CALFED Program and will evaluate individual activities in the context of the overall program.

C. The Signatories recognize that this Understanding makes no conclusions about the nature of, or extent of, control measures that may be required for individual activities that need Clean Water Act Section 401 certification.

D. The Signatories recognize that the CALFED agencies have completed and certified a Final Programmatic Environmental Impact Statement and Report (EIS/EIR) for the CALFED Bay-Delta Program.

E. The SWRCB and RWQCBs agree that 401 certifications for actions consistent with the Final Programmatic EIS/EIR will be based on whether the proposed discharge complies with applicable effluent limitations, State water quality standards and other appropriate water quality requirements.

F. The Signatories agree to consider a generalized permit certification process during Stage 1 of implementation, pursuant to California Code of Regulations, title 23, section 3861.

III. ADDITIONAL PROVISIONS

A. Applicability of this Understanding. This Understanding was developed in response to a unique circumstance, namely the CALFED Bay-Delta Program, and does not have broader applicability beyond the CALFED Program.

B. Limitations on this Understanding. This Understanding does not provide a determination of compliance for individual CALFED activities that may result in a discharge of a pollutant into waters of the United States.

C. Reservation of Authorities. This Understanding does not modify existing agency authorities by reducing, expanding or transferring any of the statutory or regulatory authorities and responsibilities of any of the Signatories.

D. Reservation of Agency Position. No Signatory to this Understanding waives any administrative claims, positions, or interpretations it may have with respect to the applicability or enforceability of any law or regulation.

E. Obligation of Funds, Commitment of Resources. Nothing in this Understanding shall be construed as obligating any of the Signatories to the expenditure of funds in excess of appropriations authorized by law or otherwise commit any of the Signatories to actions for which it lacks statutory authority.

F. Nature of Understanding. This Understanding is not intended to, and does not, create any other right or benefit, substantive or procedural, enforceable at law or equity by a party against the United States, the State of California, any agencies thereof, any officers or employees thereof, or any other person.

Having considered the contents of this document, its attachments and the documents supporting this decision, we hereby adopt this Clean Water Act, Section 401 Memorandum of Understanding. By signing this document together, we exercise our respective authorities over only those portions relevant to our authority.

Signed and dated:

United States of America

Lester A. Snow, Director, Mid-Pacific Region — Date
U.S. Bureau of Reclamation

State of California

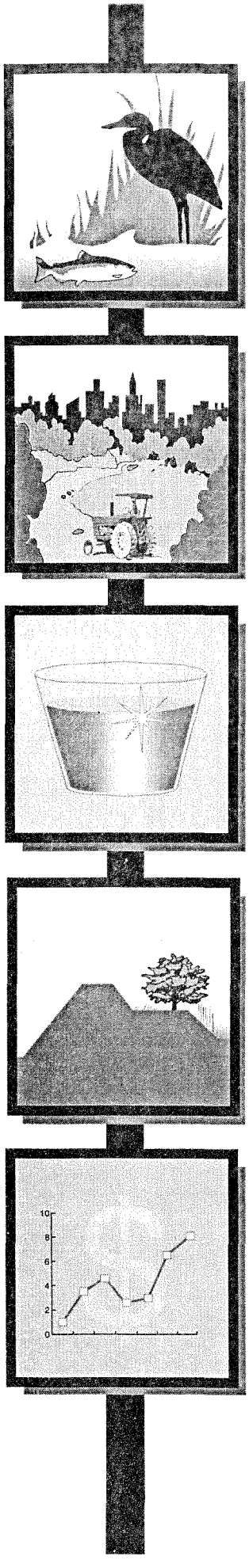
Ed Anton, Acting Executive Director — 8/28/00 Date
State Water Resources Control Board

Lawrence Kolb, Acting Executive Officer — 8/23/2000 Date
San Francisco Bay Regional Water Quality Control Board

Gary Carlton, Executive Officer — 24 Aug 2000 Date
Central Valley Regional Water Quality Control Board

Thomas M. Hannigan, Director — 8/28/2000 Date
California Department of Water Resources

Robert C. Hight, Director — 8/28/00 Date
California Department of Fish and Game



CALFED
BAY-DELTA
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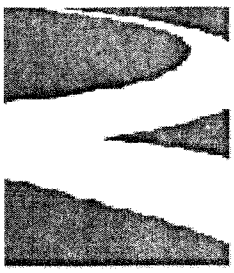
Attachment 9
Coastal Zone Management Act Programmatic Consistency Determination

August 28, 2000



CALFED
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COASTAL ZONE MANAGEMENT ACT PROGRAMMATIC CONSISTENCY DETERMINATION FOR THE CALFED BAY-DELTA PROGRAM

July 2000

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COASTAL ZONE MANAGEMENT ACT PROGRAMMATIC CONSISTENCY DETERMINATION FOR THE CALFED BAY-DELTA PROGRAM

1.0 BACKGROUND

The Coastal Zone Management Act of 1972 (CZMA) requires federal agencies to preserve, protect, and, where possible, restore and enhance the resources of the coastal zone (16 USC 1451 et seq.). Coastal states must develop coastal zone management programs to be reviewed and approved by the secretary of commerce through the National Oceanic and Atmospheric Administration (NOAA). Federal agencies are required to certify that any proposed activities within or affecting the coastal zone are consistent with the coastal state's program. The coastal state notifies the federal agencies of its concurrence with or objection to the certification. If the coastal state finds that the proposed activity is inconsistent with its program, the federal agencies must obtain an override from the Secretary of Commerce before action can commence.

California developed a coastal zone management program through the McAteer/Petris Act, the Suisun Marsh Preservation Act and the California Coastal Act of 1976 (Coastal Act) (Division 20, 30000 et seq. Cal. Pub. Res. Code). Local governments within the coastal zone are responsible for implementing the program. The San Francisco Bay Conservation and Development Commission (BCDC) oversees the San Francisco Bay segment of the coastal zone management program, in addition to administering the other two above-referenced laws, and has permit jurisdiction over projects at any location within 100 feet inland of the highest tidal action around San Francisco and Suisun Bays. It has jurisdiction over projects within specific waterways up to the legally defined Sacramento-San Joaquin Delta (east of Chipps Island) that empty into San Francisco Bay and within specific saltponds and managed wetlands. Additionally, BCDC has direct permit authority over all activities and land uses defined in the Suisun Marsh Preservation Act, specifically projects within the "primary management area", which includes all tidal waters and marshes, managed wetlands, and lowland grasslands. Any person or public agency proposing to deposit fill; extract materials; or change the use of water, land, or structures in or around San Francisco or Suisun Bays must obtain a development permit from BCDC or, if proposing to conduct such development in or around Suisun Marsh, a marsh development permit from BCDC.

The CALFED Bay-Delta Program (CALFED) Preferred Alternative includes programmatic actions (undertaken either directly or indirectly through approval by federal agencies) that would most likely involve depositing fill; extracting materials; or changing the use of water, land, or structures in or around San Francisco or Suisun Bays and therefore would require compliance with CZMA. Because these activities have the potential to affect the coastal zone, CALFED prepared this consistency determination to document the possible effects of the Preferred Alternative on coastal resources and the actions that CALFED will take to ensure that the Preferred Alternative is implemented in a manner consistent, to the maximum extent practicable, with the McAteer/Petris Act, the Suisun Marsh Preservation Act and CZMA. The potential

geographic overlap between CALFED's geographic scope and BCDC's coastal zone jurisdiction is depicted in Figure 1.

This federal consistency determination is based on a general evaluation of the proposed CALFED action at the programmatic level. Development and environmental review of the Preferred Alternative during Phase II requires compliance with CZMA even though no specific action will be implemented during this phase. CALFED implementing agencies will return to the Commission for individual permits/consistency determinations at the time site-specific projects are proposed.

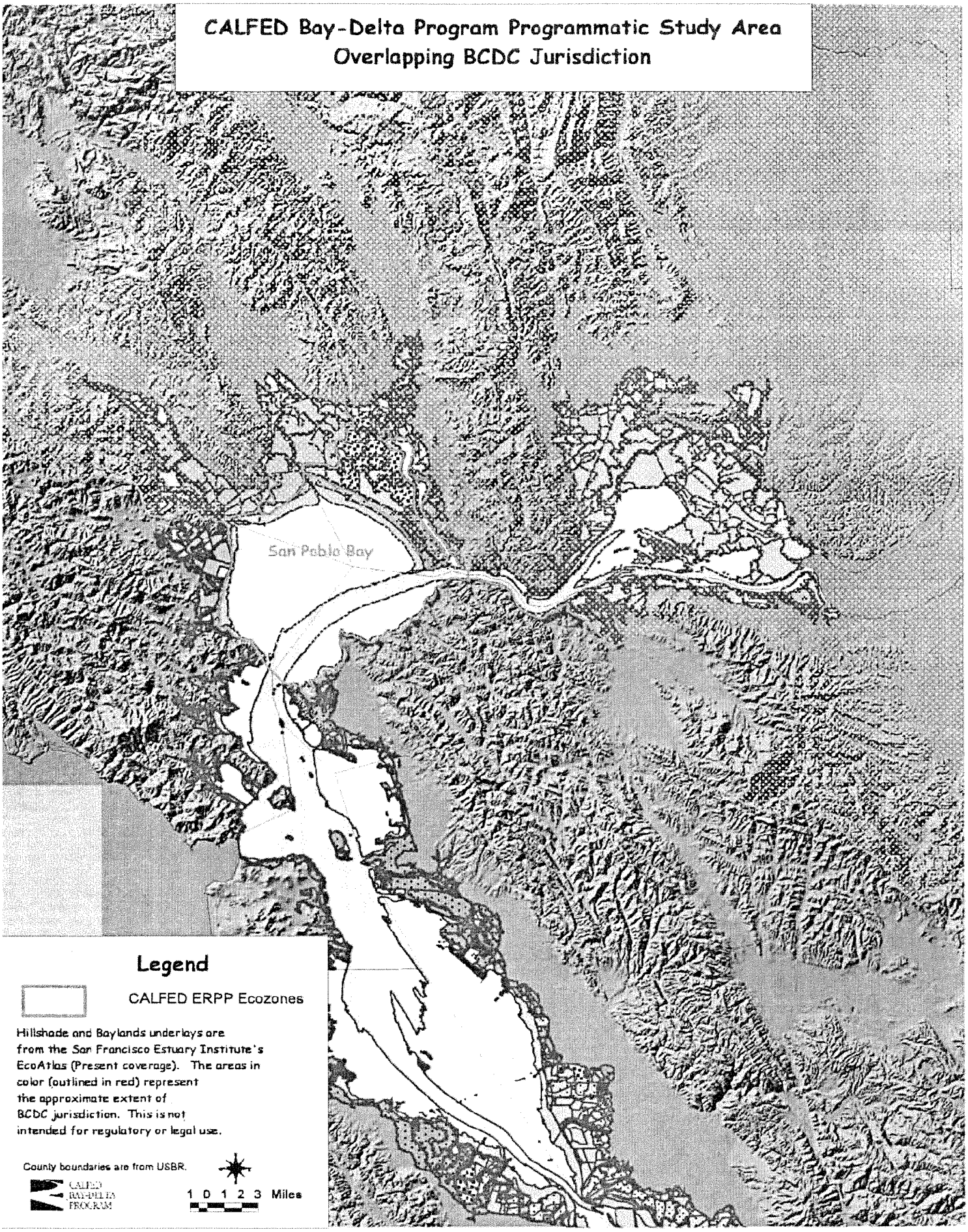
2.0 DESCRIPTION OF THE PROPOSED CALFED BAY-DELTA PROGRAM

CALFED is currently at the culmination of a years-long planning process that began with the signing of the Bay-Delta Accord in 1996. Since that time, 18 state and federal agencies have worked together to devise a plan for restoring the ecosystem of the fragile Bay-Delta, while meeting the water reliability and water quality needs of millions of the state's citizens. During this process, there has been close and ongoing consultation with all the stakeholders involved with the ecosystem and water use. This process has been long and difficult, but has resulted in the current Preferred Alternative, which most involved stakeholders and political leaders agree will go the furthest toward meeting the many differing goals of CALFED.

As described in the EIS/EIR and Program Plans, CALFED will be of tremendous benefit to the Bay and its ecosystem. Under CALFED, tens of thousands of acres of land will be improved for habitat or restored to their natural marsh conditions. CALFED actions will be aimed at improving conditions for many Bay species, especially anadromous fish and endangered species. High-quality fresh water will be available during times of the year when dealing with saltwater intrusion is most problematic. Overall flows to the Bay will be of better-quality water, with fewer pollutants and contaminants. If feasible, improved levees in the Suisun marsh will protect marsh habitats from the dangers of catastrophic levee failure, and resulting saltwater intrusion. Brackish marsh habitat will be protected and increased. By purchasing water for ecosystem needs, the Environmental Water Account will provide water for fish species when they need it most, without disrupting water needs of other users.

Against the many benefits to the Bay, the EIS/EIR acknowledges that there is a potential for adverse consequences. When outflows are at their highest, a small portion may be retained as storage. Currently, CALFED'S many experts and consultants are unable to document any adverse environmental impacts which would result from this detention, but part of the CALFED Program is to study the possible impacts of this action. Also, X2 may move a fraction of a kilometer to the east. Again, no adverse impact can be identified for this potential move, but CALFED has committed to study the issue. Before any individual projects are built, these questions would need to be answered, and impacts, if any, would need to be mitigated. Any project proposed within the jurisdiction of BCDC would need to return to the Commission for a consistency determination before that particular action or project could go forward.

CALFED Bay-Delta Program Programmatic Study Area
Overlapping BCDC Jurisdiction



Legend

CALFED ERPP Ecozones

Hillshade and Baylands underlays are from the San Francisco Estuary Institute's EcoAtlas (Present coverage). The areas in color (outlined in red) represent the approximate extent of BCDC jurisdiction. This is not intended for regulatory or legal use.

County boundaries are from USBR.

CALFED BAY-DELTA PROGRAM

1 0 1 2 3 Miles

Viewed together, as CALFED must be, the many beneficial aspects of the Program to the Bay appear to outweigh the few potential negative aspects.

CALFED is a three-phase effort to develop a long-term solution to problems affecting the San Francisco Bay/Sacramento-San Joaquin Delta estuary (Bay-Delta) in northern California. CALFED identified four categories of problems: ecosystem quality, water quality, water supply reliability, and levee system vulnerability. These categories are addressed through the CALFED Ecosystem Restoration Program, Water Quality Program, Water Use Efficiency Program, Water Transfer Program, Levee System Integrity Program, Watershed Program, Water Storage and Delta Conveyance.

During Phase I, CALFED identified the problems it would attempt to solve, developed a mission statement and several guiding principles, and designed three alternative solutions (including 17 variations). Phase II consisted of an effort to narrow the range of alternatives, a broad-based environmental review of four remaining alternative solutions and identification of one Preferred Alternative. This programmatic federal consistency determination is based on the outcome of Phase II.

Four Phase II alternatives were analyzed in the Programmatic Environmental Impact Statement/Environmental Impact Report (EIS/EIR). Each of the alternatives includes common elements related to ecosystem restoration, water quality, water use efficiency, watershed, water transfers and levee system integrity. Programmatic actions related to water storage and Delta conveyance vary between the alternatives. The alternatives are described in detail in the Programmatic EIS/EIR Section 2, "Alternative Descriptions".

Phase III, which will involve project-level environmental reviews and approvals and implementation of the Preferred Alternative, will be executed in stages over 30 years or more. Stage I of the Program represents actions for the first 7 years. Proposed project-level actions under Phase III may require subsequent federal consistency determinations, as discussed in Section 5.0, "Next Steps". Phase III projects will be tiered from and be consistent with the Programmatic EIS/EIR, and will refer to the mitigation strategies and findings included in that document.

2.1 CALFED Ecosystem Restoration Program

CALFED's proposed Ecosystem Restoration Program (ERP) focuses at a programmatic level primarily on the Bay-Delta, the Sacramento River, the San Joaquin River, and their tributary watersheds directly connected to the Bay-Delta system below major dams and reservoirs. Secondarily, the ERP solution scope addresses San Francisco Bay, San Pablo Bay, Suisun Bay and the upper watersheds above the major dams.

The ERP focuses on restoring ecological processes associated with streamflow, stream channels, watersheds, and floodplains. The ERP implementation strategy relies heavily on adaptive management, a technique that involves identifying indicators of ecosystem health, comprehensively monitoring these indicators, improving understanding of the system through focused research, and implementing actions in

phases to incorporate new knowledge. The ERP includes the following broad ranges of programmatic restoration actions:

- 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.
- Maintaining brackish tidal wetlands in Suisun Marsh.
- Reconnecting Bay-Delta tributaries with their floodplains through constructing setback levees, acquiring flood easements, and constructing and expanding flood bypasses.
- 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 removing dams, constructing fish ladders, and constructing fish screens that use the best available technology.

In addition to this range of actions, the Environmental Water Account (EWA), part of CALFED's Water Management Strategy, is designed to improve fisheries protection and recovery while providing improvements in water quality and water supply reliability. The EWA will rely on more flexible management of water based on real-time needs of the fishery resources. The EWA functions primarily by changing the timing of some flow releases from storage and the timing of water exports from the south Delta pumping plants to coincide with periods of greater or lesser vulnerability of various fish to Delta conditions. The EWA will be established to provide water for protection and recovery of fish beyond water available through existing regulatory actions related to project operations.

2.2 Water Quality Program

The Program is committed to achieving continuous improvement in the quality of the waters of the Bay-Delta system with the goals of minimizing ecological, drinking water, and other water quality problems and of maintaining this quality once achieved. 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. The Water Quality Program includes the following actions:

- **Drinking water parameters.** Reducing the loads and impacts of bromide, total organic carbon (TOC), pathogens, nutrients, salinity, and turbidity through a combination of measures - including source reduction, alternative sources of water, treatment, storage, and, if necessary, conveyance improvements such as a screened diversion facility (up to 4,000 cfs) on the Sacramento River.

- **Pesticides.** Reducing the impacts of pesticides through (1) development and implementation of best management practices (BMP's) for both urban and agricultural uses; and (2) support of pesticide studies for regulatory agencies, while providing education about and assistance with implementation of control strategies for the regulated pesticide users.

- **Organochlorine pesticides.** Reducing the load of organochlorine pesticides in the system by reducing runoff and erosion from agricultural lands through BMP's.

- **Trace metals.** Reducing the impacts of trace metals, such as copper, cadmium, and zinc, in upper watershed areas near abandoned mine sites. Reducing the impacts of copper through urban stormwater programs and agricultural BMP's.

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

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

- **Salinity.** Reducing salt sources in urban and industrial wastewater to protect drinking and agricultural water supplies; facilitating development of successful water recycling, source water blending, and groundwater storage programs. Salinity in the Delta would be controlled by limiting salt loadings from its tributaries through managing sea-water intrusion by such means as: (1) using storage capability to maintain Delta outflow and to adjust the timing of outflow, (2) managing exports, and (3) making modifications to the Delta and Bay.

- **Turbidity and sedimentation.** Reducing the turbidity and sedimentation that adversely affect several areas in the Bay-Delta and its tributaries.

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

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

2.3 WATER USE EFFICIENCY PROGRAM

The CALFED Water Use Efficiency Program reflects California's public policy that places strong emphasis on the efficient use of developed water supplies. The Water Use Efficiency Program includes policies covering five main areas: efficient use of agricultural water, urban water conservation, efficient use of environmental diversions (identification of BMPs for refuge water management and development of a planning process for managing water use at refuge and wetland areas), and water recycling. This will rely on local entities to implement water use efficiency actions to achieve objectives related to water quantity, quality, flow and timing. CALFED will develop an incentive grant program to invest in local projects that are not locally cost-effective. For most of these projects, some local benefits will accrue. When this is the case, CALFED will insist on a local cost share commensurate with the local benefits.

2.4 WATER TRANSFER PROGRAM

The Water Transfer Program will encourage the development of a more effective water market that facilitates water transfers and streamlines the approval process while protecting water rights, environmental conditions, and local economic interests. A more effective transfer market can improve water availability for all users, 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.

2.5 LEVEE SYSTEM INTEGRITY PROGRAM

Improvements to Delta levees and channels are included in the Levee System Integrity Program to reduce the risk of failure caused by floods, earthquakes, and general deterioration of Delta flood control facilities. This program provides for uniform funding and guidance to increase the level of protection throughout the Delta and focuses on five approaches to improve the integrity of the Delta levee system:

- Delta Levee Base Level Protection Plan. Improving and maintaining Delta levee system stability to meet the Corps' Public Law (PL) 84-99 standard.

- Delta Levee Special Improvement Projects. Enhancing flood protection for key islands that provide state-wide benefits to the ecosystem, water supply, water quality, economy, and infrastructure.

- Delta Levee Subsidence Control Plan. Implementing current best management practices (BMPs) to correct subsidence adjacent to levees and coordinating research to quantify the effects and extent of inner-island subsidence.

- Delta Levee Emergency Management and Response Plan. Implementing actions that will build on existing state, federal, and local agency emergency management programs.

- Delta Levee Risk Assessment. Performing a risk assessment to quantify the major risks to Delta resources from floods, seepage, subsidence, and earthquakes; evaluating the consequences; and developing recommendations to manage the risk.

CALFED has also added the Suisun Marsh to its Levee Program to achieve its primary objectives in Ecosystem Restoration and Water Quality.

Ensuring the integrity of the exterior levees in the Suisun Marsh is critical to sustaining seasonal wetland values provided by the Marsh's managed wetlands. Improved levees would ensure that conversion to tidal wetlands will not be due to levee failure, but instead, will be planned with consideration of landowner support, ERP targets, regional wetland goals, and endangered species recovery plans.

CALFED's modeling research clearly indicates there is significant risk of water quality impacts in the Delta if Suisun Marsh levees are not maintained.

2.6 WATERSHED PROGRAM

CALFED's Watershed Program is designed to restore ecological health and improve water management of the Bay delta system by working with local communities at a watershed level. The Program will use a comprehensive, integrated basin-wide approach to help improve conditions in the Bay-Delta system, emphasizing local participation and government cooperation at all levels. The Watershed Program will focus on land and water management actions that will benefit water quality and improve water reliability in the Bay-Delta system. The Program will provide financial and technical assistance to local watershed groups to help assess, plan and conduct watershed management activities, including restoration projects, basin and project scale monitoring and conservation education.

2.7 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.

CALFED initially evaluated twelve potential surface storage sites in Phase II. These potential sites have been narrowed to sites which will be evaluated in Phase III, and if found feasible, could begin construction. Potential storage projects include:

- An in-Delta storage facility of approximately 250 TAF.
- Expansion of CVP storage in Shasta Lake by approximately 300 TAF.
- Expansion of Los Vaqueros Reservoir by up to 400 TAF with local partners as part of a Bay Area water quality and water supply initiative.
- Develop locally-managed and controlled groundwater and conjunctive use projects with a total of 500 TAF to 1 MAF additional storage capacity.

An additional two storage sites will be evaluated in Stage I, with feasibility studies undertaken, and if found feasible, environmental review completed:

- Sites Reservoir in Colusa County, with a potential storage of 1.9 MAF.
- Additional storage of 250-700 TAF in the upper San Joaquin watershed

Aggressive implementation of water conservation, recycling, and a protective water transfer market would continue to be used as appropriate to meet Program goals. All projects would be required to complete environmental reviews, and would be subject to all applicable permit requirements.

2.8 CONVEYANCE

Four alternative variations for conveyance were analyzed in the Programmatic EIR/EIS. These four variations, which combine various strategies and facilities for diverting and conveying water from the Delta, are described in Chapter 2 of the EIS/EIR. This section focuses on a description of the water conveyance components of the Preferred Alternative, which forms the basis for the consistency determination.

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

South Delta Improvements. Under the Preferred Program Alternative, south Delta improvements include:

- Constructing a new screened intake at Clifton Court Forebay (CCFB) with protective screening criteria.

- Constructing either a new screened diversion at Tracy with protective screening criteria and/or expanding the new diversion at CCFB to meet the Tracy Pumping Plant export capacity.

- Implementing the Joint Point of Diversion (JPOD) for the SWP and CVP, and constructing interties.

- Constructing an operable barrier at the head of Old River to improve conditions for salmon migrating up and down the San Joaquin River.

- Implementing actions to ensure the availability of water of adequate quantity and quality to agricultural diverters within the south Delta, and to contribute to restoring ecological health of aquatic resources in the lower San Joaquin River and south Delta. Actions may include channel dredging, extending and screening agricultural intakes, consolidating agricultural intakes, constructing operable barriers, and levee setbacks and levee improvements (such as reinforcing levees or controlling seepage). Actions will be staged, with appropriate monitoring and testing to guide the implementation process.

- Changing the SWP operating rules to allow export pumping up to the current physical capacity of the SWP export facilities.

North Delta Improvements. 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.

  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 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 DCC and the diversion facility on the Sacramento River will be completed simultaneously. The result 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, the facility will be constructed as a part of the Preferred Program Alternative.

- Constructing new setback levees or dredging and/or improving existing levees along the channels of the lower Mokelumne River system from I-5 downstream to the San Joaquin River.

3.0 MANAGEMENT PROGRAM FOR THE SAN FRANCISCO BAY SEGMENT OF THE CALIFORNIA COASTAL ZONE

BCDC's management program for the San Francisco Bay segment of the California coastal zone consists primarily of the policies contained in the San Francisco Bay Plan, the Suisun Marsh Protection Plan, and the McAteer-Petris Act (the legislation that created BCDC).

3.1 SAN FRANCISCO BAY PLAN

The San Francisco Bay Plan (San Francisco Bay Conservation and Development Commission 1969) sets forth policies relevant to CALFED programmatic-level actions that may occur within San Francisco Bay. These policies are summarized below.

3.1.1. FISH AND WILDLIFE

- The benefits of fish and wildlife in the Bay should be ensured for present and future generations of Californians; therefore, to the greatest extent feasible, the remaining marshes and mudflats around the Bay, the remaining water volume and surface area of the Bay, and adequate freshwater inflow into the Bay should be maintained.

- Specific habitats that are needed to prevent the extinction of any species or to maintain or increase any species that would provide substantial public benefits should be protected, whether in the Bay or on the shoreline behind dikes.

3.1.2 WATER QUALITY

- To the greatest extent feasible, the area covered by Bay marshes and mudflats and the surface area and volume of Bay water should be maintained and, whenever possible, increased. Freshwater inflow to the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses. Polluting Bay waters should be avoided.

- Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay, as identified in the San Francisco Bay Regional Water Quality Control Board's basin plan.

- Shoreline projects should be properly designed and appropriate erosion control practices should be used during construction to reduce soil erosion and protect the Bay from increased sedimentation.

- Polluted runoff from projects should be controlled using BMPs to protect water quality and the beneficial uses of the Bay, especially where water dispersion is poor and the project is near shellfish beds or other significant biotic resources.

3.1.3 FRESHWATER INFLOW

- Freshwater diversions should not cause reduced inflows into the Bay to the extent that it damages the oxygen content of the Bay, reduces flushing of the Bay, or hinders the ability of the Bay to support existing wildlife.

- High priority should be given to the preservation of Suisun Marsh through adequate protective measures, including maintaining freshwater inflows.

- The impacts of upstream freshwater diversions on inflow to the Bay should be monitored by the California State Water Resources Control Board (SWRCB).

3.1.4 WATER SURFACE AREA AND VOLUME

- The surface area of the Bay and the total volume of water should be kept as large as possible to maximize active oxygen interchange, vigorous circulation, and effective tidal action. Filling and diking that reduce the surface area and volume of water should therefore be allowed only to provide substantial public benefits and only if there is no reasonable alternative.

- Water circulation in the Bay should be maintained and improved as much as possible. Any proposed fills, dikes, or piers should be thoroughly evaluated to determine their effects on water circulation and modified as necessary to improve circulation or, at least, minimize any harmful effects.

3.1.5 MARSHES AND MUDFLATS

- Salt marshes and mudflats should be maintained to the fullest extent possible to conserve fish and wildlife and to abate air and water pollution. Filling and diking that eliminate marshes and

mudflats should be allowed only to provide substantial public benefits and only if there is no reasonable alternative.

- Any proposed fills, dikes, or piers should be thoroughly evaluated to determine their effects on marshes and mudflats and modified as necessary to minimize any harmful effects.

- To offset possible additional losses from necessary filling and to augment the present marshes: (a) former marshes should be restored when possible by removing existing dikes; (b) in areas selected on the basis of competent ecological study, some new marshes should be created through carefully placed lifts of dredged spoils; and (c) the quality of existing marshes should be improved by appropriate measures whenever possible.

3.1.6 Saltponds and Other Managed Wetlands

- As long as is economically feasible, the salt production in saltponds and the present use of wetlands should be maintained. The integrity of the salt production system should be respected (i.e., public agencies should not take, for other projects, any pond or portion of the pond that is a vital part of the production system).

3.1.7 Shoreline Protection

- New shoreline erosion control projects and the maintenance or reconstruction of existing erosion control facilities should be authorized if: (a) the project is necessary to protect the shoreline from erosion, (b) the type of the protective structure is appropriate for the project site and the erosion conditions at the site, and (c) the project is properly designed and constructed.

- Riprap revetments should be constructed of properly sized and placed materials that meet sound engineering criteria.

- Authorized protective projects should be regularly maintained according to a long-term maintenance program to ensure that the shoreline will be protected from tidal erosion and that the effects of the necessary erosion control project on natural resources during the life of the project will be minimized.

- Shoreline protective projects should, where feasible, include provisions for nonstructural methods, such as marsh vegetation.

3.2 SUISUN MARSH PROTECTION PLAN

The Suisun Marsh Protection Plan (San Francisco Bay Conservation and Development Commission 1976) sets forth the following policies relevant to CALFED programmatic-level actions that may occur within Suisun Marsh.

3.2.1 Environment

- Habitat diversity in Suisun Marsh and the surrounding upland areas should be preserved and enhanced wherever possible to maintain the unique wildlife resources.

- The waterways, managed wetlands, tidal marshes, seasonal marshes, and lowland grasslands are critical habitats for marsh-related wildlife and are essential to the integrity of Suisun Marsh; therefore, these habitats deserve special protection.

- Existing uses should continue in the upland grasslands and cultivated areas surrounding the critical habitats of Suisun Marsh to protect the marsh and preserve valuable marsh-related wildlife habitats. Where feasible, the value of the upland grasslands and cultivated lands as habitat for marsh-related wildlife should be enhanced.

- The eucalyptus groves in and around Suisun Marsh, particularly those on Joice and Grizzly Islands, should not be disturbed.

3.2.2 WATER SUPPLY AND QUALITY

- Water quality standards in Suisun Marsh should be met by maintaining adequate inflows from the Delta.

- Projects designed to import or redistribute the fresh water in the marsh for salinity control should be planned carefully so that the expected benefits are realized. Any proposed import project should be studied to determine whether the project would adversely affect the marsh by encouraging urban and industrial growth in the marsh area. No import project should be constructed if the adverse environmental impacts of growth on the marsh would outweigh the possible beneficial impacts of salinity control.

- Groundwater to supplement surface flows may be used to prevent crop damage in some areas. Withdrawal of groundwater from the underground aquifers should not be so extensive as to allow the saltwater of the marsh to intrude into freshwater aquifers or to disrupt the natural subsurface flow of groundwater into the marsh.

- Disruption or impediments to runoff and streamflow in the Suisun Marsh watershed should not be permitted if either would result in adverse effects on the quality of water entering the marsh. Riparian vegetation in the immediate Suisun Marsh watershed should be preserved and stream modification permitted only if it is necessary to ensure the protection of life and existing structures from floods.

- Municipal, industrial, and agricultural discharges should be monitored to ensure that adequate water quality in Suisun Marsh is maintained.

- Existing and new agricultural drainage systems should meet all applicable State and federal water quality standards. All discharge permits for agricultural drains should be based on a thorough study of the effects of the outflow, flushing, and mixing patterns in Suisun Bay and Suisun Marsh to guarantee that no adverse impact on the marsh results from any discharge.

- Industrial facilities adjacent to or upstream of the marsh should not be developed if they have the potential to cause significant threats to water quality in the marsh. Activities at industrial facilities that could significantly alter the temperature, salinity, or turbidity of the water should be prohibited.

3.2.3 Utilities, Facilities, and Transportation

- Whenever construction occurs within wetlands, it should be confined to the dry months (generally mid-April through mid-October) to minimize disturbance of wetland vegetation, wintering migratory waterfowl, other water birds, or nesting resident birds.

- In water areas (bays and sloughs), dredging should be scheduled to avoid major fish migration periods.

- All plans for construction within the marsh should be reviewed by the California Department of Fish and Game (DFG) to ensure that impacts on marsh flora and fauna of construction methods and timing are minimized.

- Suisun channel dredging and any other dredging in marsh waterways should meet the following requirements: dredging should be for water-oriented uses or other important public purposes; the materials to be dredged should meet the water quality requirements of the San Francisco Bay RWQCB; and important marsh fisheries, wildlife, and their habitats should be protected.

- Dredged materials in the marsh should be disposed in nontidal areas where, consistent with policies of the Suisun Marsh Protection Plan, the materials can be used to help restore, enhance, or manage the marsh.

3.2.4 WATER-RELATED INDUSTRY

- The Collinsville site extends approximately 8 miles from the Sacramento River north to Little Honker Bay. The Collinsville site is only part of an extensive shoreline area fronting on deep water that extends from Collinsville to Rio Vista. This area, with approximately 12.5 lineal miles of deep water frontage, represents an important part of the total Bay Area inventory of water-related industrial sites. The western portion of the Collinsville site area may be restored or enhanced provided that the restoration or enhancement program is carried out in a manner that will not preclude use of the eastern portion of the Collinsville site for water-related industry and port use. Specifically, any wetland restoration should be designed to allow for development and operation of marine terminals and marine terminal berths on the deepwater shoreline and allow access for the movement of waterborne cargo, materials, and products from the shoreline terminal to the upland, eastern portions of the site.

- Remaining areas of lowland grassland and seasonal marsh on the Collinsville site should be preserved and, whenever possible, enhanced or restored for their intrinsic value as marsh-related wildlife habitat and to act as a buffer between the Suisun Marsh and industrial and port activities. Dredged materials may be used in any wetland enhancement or restoration program when such activity will be conducted without adverse environmental impacts on the marsh.

3.2.5 LAND USE AND MARSH MANAGEMENT

- Managed wetlands, tidal marshes, lowland grasses, and seasonal marshes should be included in a primary management area. Within the primary management area, existing uses should continue and both land and water areas should be protected and managed to enhance the quality and diversity of habitats.

- Tidal marshes in the primary management area should be preserved.

- The water management schedule developed by the U.S. Department of Agriculture Natural Resources Conservation Service and DFG and ratified by the Solano County Mosquito Abatement District should be used to the maximum extent possible in the managed wetlands.

- Burning in the primary management area should be kept to a minimum to prevent uncontrolled fires that might destroy beneficial plant species and damage peat leaves and to minimize air pollution.

- Water should be impounded to create or maintain a permanent pond only under the following situations: in deep ponds that are difficult to drain and manage as seasonally flooded marshes, in limited shallow areas where habitat diversity is desired, and in areas of high salinity

concentrations. Water levels in permanent ponds should be kept constant and water circulated to control mosquitos.

- The upland grasslands and cultivated lands surrounding the marsh should be included in a secondary management area. The secondary management area should function as a buffer, insulating the habitats within the primary management area from adverse impacts of urban development, other land uses, and land practices incompatible with preservation of the marsh.

- Wetland resources on portions of the Collinsville site may be enhanced or restored consistent with Suisun Marsh Protection Plan policies on water-related industries.

- Where feasible, historical marshes should be returned to wetland status, whether as tidal marshes or managed wetlands.

- Any proposed development in the Suisun Marsh watershed or secondary management area where there are poor soil conditions for construction or that is seismically active should be controlled to prevent or minimize earth disturbance, erosion, water pollution, and hazards to public safety.

- Riparian vegetation in the immediate Suisun Marsh watershed should be preserved because of its importance in maintaining water quality and its value as marsh-related wildlife habitat. Stream modification should be permitted only if proven necessary to ensure the protection of life and existing structures from floods and only the minimum amount of modification necessary should be allowed.

3.3 McAteer-Petris Act

The McAteer-Petris Act (Sections 66600 et seq. California Government Code) sets forth the following policies relevant to CALFED programmatic-level actions that may involve placing fill; extracting materials; or changing the use of any land, water, or structure within the area of BCDC's jurisdiction:

- Further filling of the San Francisco Bay and specific waterways should be authorized only when public benefits from fill clearly exceed public detriment from the loss of the water areas and should be limited to water-oriented uses, such as ports, water-related industries, airports, bridges, wildlife refuges, water-oriented recreation and public assembly, water intake and discharge lines for desalinization and power-generating plants requiring large amounts of water for cooling purposes, or minor fill for improving shoreline appearance or public access to the Bay.

- Fill in the Bay and specific waterways should be authorized only when no alternative upland location is available for such purpose.

- The water area authorized to be filled should be the minimum necessary to satisfy the purpose of the fill.

- Priority use areas should be protected, and maximum feasible public access should be provided with proposed projects.

- The nature, location, and extent of any fill should be such that harmful effects on the Bay Area, such as the reduction or impairment of the volume, surface area, or circulation of water; water quality; fertility of marshes; or fish or wildlife resources, would be minimized.

- Public health, safety, and welfare require that fill be constructed in accordance with sound safety standards that will afford reasonable protection to persons and property against the hazards of unstable geologic or soil conditions or of flood- or stormwaters.

- Fill should be authorized when it would, to the maximum extent feasible, establish a permanent shoreline.

The term "specific waterways" refers to all areas subject to tidal action on or tributary to the listed portions of the following waterways: (1) Plummer Creek in Alameda County to the eastern limit of the saltponds; (2) Coyote Creek (and branches) in Alameda and Santa Clara Counties to the easternmost point of Newby Island; (3) Redwood Creek in San Mateo County to its confluence with Smith Slough; (4) Tolay Creek in Sonoma County to the northerly line of Sears Point Road (State Route 37); (5) Petaluma River in Marin and Sonoma Counties to its confluence with Adobe Creek, and San Antonio Creek to the easterly line of the Northwestern Pacific Railroad right-of-way; (6) Napa River to the northernmost point of Bull Island; (7) Sonoma Creek to its confluence with Second Napa Slough; (8) Corte Madera Creek in Marin County to the downstream end of the concrete channel on Corte Madera Creek, which is located at USACE Station No. 318+50 on the Corte Madera Creek Flood Control Project.

4.0 PROGRAMMATIC DETERMINATION OF FEDERAL CONSISTENCY

This federal consistency determination consists of a general programmatic-level assessment of the CALFED Preferred Alternative, which comprises eight elements (Ecosystem Restoration Program, Water Quality Program, Water Use Efficiency Program, Water Transfer Program, Levee System Integrity Program, Watershed Program, Storage and Conveyance). This consistency determination begins by describing the programmatic actions in each of these programs that may affect San Francisco Bay or Suisun Marsh, then summarizes the programmatic consistency of those five programs with relevant policies contained in the San Francisco Bay Plan, the Suisun Marsh Protection Plan, and the McAteer-Petris Act.

4.1 Programmatic Actions in the CALFED Preferred Alternative That May Affect San Francisco Bay or Suisun Marsh

4.1.1 CALFED Ecosystem Restoration Program

The Ecosystem Restoration Program is likely to directly affect the coastal zone resources within the jurisdiction of BCDC because its geographic sphere includes Suisun Marsh and portions of San Francisco Bay. The Suisun Marsh/North San Francisco Bay Ecological Zone is the westernmost zone described in the ERP and consists of five ecological units: Suisun Bay and Marsh, Napa River, Sonoma Creek, Petaluma River, and San Pablo Bay.

The overall CALFED vision for the Suisun Marsh/North San Francisco Bay Ecological Zone includes providing a more natural freshwater outflow pattern from the Delta in dry and normal rainfall years, restoring tidal and nontidal wetlands, restoring tidal perennial aquatic habitat, and screening unscreened and poorly screened diversions. These changes will assist in the recovery of special-status species and increase important fish, wildlife, and plant communities.

Within the Suisun Bay and Marsh Ecological Unit of this zone, ERP actions focus on restoring tidal action to selected managed wetlands and promoting the natural riparian and wetland succession in Suisun Marsh. Shallow-water, wetland, and riparian habitats in Suisun Marsh and along the shoreline of Suisun Bay will be protected and improved, where possible. Brackish marsh areas will be restored and protected. Upland habitats adjacent to riparian and wetland habitats also will be protected and improved. Efforts will focus on increasing the acreage open to tidal flows (e.g., by removing or opening levees) and providing connectivity between habitat areas to aid in the recovery of species such as the salt marsh harvest mouse, clapper rail, and black rail. Aquatic species, including chinook salmon, striped bass, delta smelt, splittail, and other estuarine resident fish in Suisun Marsh and Suisun Bay, will benefit from improving Suisun Marsh and the slough habitats.

Diverting water from Suisun Marsh channels for use in managed nontidal wetlands will continue, as will operation of the salinity control structure on Montezuma Slough; however, consideration for maintaining the natural hydrologic regime and salinity levels of the slough and marsh will be incorporated into these actions. Entrainment of juvenile fish will be minimized through efforts to screen diversions. Existing water quality standards will be met in the marsh.

Suisun Marsh and Suisun Bay will function as high-quality spawning and rearing habitat and an effective fish migration corridor. A healthy Suisun Marsh-Bay ecosystem will be an important link in the estuary foodweb, improving primary and secondary productivity. Suisun Marsh and Bay productivity will improve as freshwater inflows in dry and normal years and the acreages of tidal wetlands and associated tidal and perennial aquatic habitats increase.

In the Napa River Ecological Unit, restoration efforts will be focused in the Napa Marsh Wildlife Area, Cullinan Ranch, and Scaggs Island and will include habitat protection and restoration of large, contiguous areas of tidal, saline, emergent wetland, riparian, and upland habitats. Restoring tidal action will improve water quality and enhance the health of the marsh, which will aid in the recovery and enhancement of terrestrial and aquatic species.

In the Sonoma Creek Ecological Unit, existing habitats will be maintained and current and future restoration efforts in the Napa/Sonoma Marsh will be expanded. Opening leveed managed marshland to tidal action will create larger, more contiguous marsh areas to support terrestrial and aquatic habitats.

In the Petaluma River Ecological Unit, Petaluma Marsh and its associated tidal slough network will be expanded. In the San Pablo Bay Ecological Unit, the ecological health of San Pablo Bay and its function as an important nursery for marine, estuarine, and anadromous fish can be enhanced by increasing freshwater inflow, protecting and expanding tidal marsh/slough habitat complexes along the margins of the bay, and reducing the input of pollutants into the bay.

4.1.2 CALFED WATER QUALITY PROGRAM

The principal objective of the CALFED Water Quality Program is to provide high-quality water for urban, agricultural, industrial, environmental, and recreational beneficial uses. The Water Quality Program has developed strategies to address water quality problems in the Delta and its tributaries. Action strategies include source control measures (such as BMP's) treatment measures, and land fallowing and land retirement programs, water recycling, source water blending, and groundwater storage programs.

The legally defined Delta, Suisun Bay to Carquinez Strait, and Suisun Marsh compose the primary geographic focus of the Water Quality Program; however, because areas outside the Delta are sources of water quality problems that affect the Delta, its inhabitant species, and users of Delta water, the Water Quality Program recommends that actions be taken throughout the entire geographic solution area as necessary. This area encompasses a large portion of California, and includes all of the areas within BCDC's jurisdiction.

4.1.3 CALFED WATER USE EFFICIENCY PROGRAM

The CALFED Water Use Efficiency Program does not describe any specific actions that would directly affect coastal resources within the San Francisco Bay segment of the California coastal zone; however, increases in the efficiency of water use have the potential to beneficially affect water resources across the Bay and Delta Regions.

4.1.4 CALFED WATER TRANSFER PROGRAM

The Water Transfer Program does not include any actions that would directly affect coastal resources within the San Francisco Bay portion of the coastal zone, e.g. water would not be transferred from coastal zone areas to other areas. Redistribution of water among users could indirectly affect the Bay through changes in water distribution schedules. The total amount of water transferred and exported that would otherwise have been Delta outflow is likely to be extremely small compared to total outflows.

However, it is not possible to accurately estimate at the current programmatic level the degree to which redistribution among users would occur.

4.1.5 CALFED LEVEE SYSTEM INTEGRITY PROGRAM

The CALFED Levee System Integrity Program, while mostly focused on Delta actions, includes an investigation to determine the feasibility of CALFED participation in the rehabilitation of Suisun Marsh levees. Rehabilitation of levees could include reconstructing portions of the levees, expanding bases of the levees and engineering techniques that reduce erosion and susceptibility to seepage and subsidence. Most levee work is carried out on the landward side, to avoid impacts to waterways. Levee actions would coordinate with ERP actions to enhance the ecosystem while increasing levee protection, when feasible. While landward-side levee work could reduce managed wetlands, ERP actions associated with this work would more than offset any such impacts by creating new shallow-water habitat. If dredging were chosen as a method of providing materials for levee reconstruction, waterside impacts could result. However, dredging is subject to permits and permit conditions which would prohibit dredging unless very stringent environmental criteria were met. At this time, it is not possible to predict the source of materials for potential levee work.

4.1.6 CALFED WATERSHED PROGRAM

Activities associated with the Watershed Program would mostly occur in the upper reaches of Bay-Delta tributaries, and would not directly impact areas in BCDC's jurisdiction. Upstream watershed improvements in Bay tributary streams could result in positive benefits to Bay water quality. While the primary focus of the Program is on upstream areas, funding could be provided to community-based watershed groups which work within BCDC's jurisdiction. Projects undertaken by such groups can include education and outreach, streamflow enhancements, biodiversity maintenance and improvement, and watershed training for local government.

4.1.7 CALFED STORAGE ELEMENT

Any new storage could change Delta outflow, but variations would not be significant compared to current outflows. Modeling results for new storage show that differences between the Program with storage included and the No Project Alternative are within the current range of uncertainty associated with the No Project Alternative. Storage within the Preferred Program Alternative would reduce annual Delta outflows by 340-700 TAF (2.3% to 4.7%), out of a total average outflow of 14.8 MAF.

Greater seawater intrusion into the Bay could occur, with increases in salinity. The Preferred Program Alternative would increase the average monthly X2 position by about .6 km in September, and may increase or decrease the average monthly X2 position by about .3 km in March. Sufficient information does not currently exist to determine if statistically-small percentage reductions in Delta outflows would

have any discernible environmental effects in the Bay. This question would be studied during the environmental reviews for any specific storage project.

New storage dedicated to environmental water supplies could enhance seasonal flow for biological communities and species in the Bay. One option for EWA water stored in the Delta is that it can be left to provide increased Delta outflow.

4.1.8 CALFED CONVEYANCE ELEMENT

The Preferred Program Alternative provides for a through-Delta water conveyance plan. No actions are contemplated within the San Francisco Bay portion of the coastal zone. The Bay region could be affected by reduced Delta outflow, but any reduction would be very slight compared to total annual outflows to the Bay (see 4.1.7 above). Potential impacts of any flow reductions would be studied at the time environmental reviews would be carried out for new conveyance projects.

4.2 DETERMINATION OF PROGRAMMATIC CONSISTENCY

Table 1 summarizes the consistency of the CALFED Preferred Alternative with the San Francisco Bay Plan, the Suisun Marsh Protection Plan, and the McAteer-Petris Act and indicates that the Preferred Alternative is consistent with these policies at a programmatic level.

This section provides a more detailed description of the consistency of the CALFED Preferred Alternative with these policies and provides information supporting this conclusion. Because the Preferred Alternative is defined in programmatic terms, its consistency has been determined by comparing its actions with the policies listed in Section 3.0, "Management Program for the San Francisco Bay Segment of the California Coastal Zone", where possible. The consistency of the Preferred Alternative with specific policies could not be determined at the programmatic level because sufficient detail about actions contained in the Preferred Alternative is not yet available. The following determination of consistency is organized by the eight elements of the CALFED Preferred Alternative for ease of understanding, but it should be noted that the Preferred Alternative must be judged as a whole rather than as individual pieces.

4.2.1 ECOSYSTEM RESTORATION PROGRAM

Table 2 lists the programmatic actions contained in the ERP that are designed to achieve CALFED's objectives in the Suisun Marsh/North San Francisco Bay Ecological Zone and indicates the consistency of each action with BCDC's policies.

The CALFED Ecosystem Restoration Program is consistent at a programmatic level with the San Francisco Bay Plan's policies regarding fish and wildlife, water quality, freshwater inflow, water surface

Table 1. Summary of Consistency of the CALFED Preferred Alternative with BCDC Policies

	Ecosystem Restoration Program	Water Quality Program	Water Use Efficiency Program	Levee System Integrity Program	Storage/ Conveyance
San Francisco Bay Plan					
Fish and wildlife	Consistent	Consistent	Not directly applicable Potential indirect beneficial effects	Not applicable	Consistency cannot be determined at program-level
Water quality	Consistent	Consistent	Not directly applicable Potential indirect beneficial effects	Not applicable	Consistency cannot be determined at program-level
Freshwater inflow	Consistent	Consistent	Not applicable	Consistent	Consistency cannot be determined at program-level
Water surface area/volume	Consistent	Consistent	Not applicable	Not applicable	Not applicable
Marshes and mudflats	Consistent	Consistent	Not applicable	Not applicable	Consistency cannot be determined at program-level
Shoreline effects	Consistency cannot be determined at program-level	Consistency cannot be determined at program-level	Not applicable	Not applicable	Consistency cannot be determined at program-level

	Ecosystem Restoration Program	Water Quality Program	Water Use Efficiency Program	Levee System Integrity Program	Storage/ Conveyance
Suisun Marsh Protection Plan					
Environment	Consistent	Consistent	Not directly applicable Potential indirect beneficial impacts	Consistent	Not applicable
Water supply and quality	Consistent	Consistent	Not directly applicable Potential indirect beneficial impacts	Not applicable	Consistency cannot be determined at program-level
Utilities/facilities/ transportation	Consistency determined at project level	Consistency determined at project level	Not applicable	Not applicable	Not applicable
Water-related industry	Consistency determined at project level	Consistency determined at project level	Not applicable	Not applicable	Not applicable
Land use/marsh management	Consistent	Consistent	Not applicable	Not applicable	Not applicable
McAteer-Petris Act	Consistency cannot be determined at program level	Consistency cannot be determined at program level	Not applicable	Not applicable	Not applicable

Ecosystem Element	Programmatic Action	Programmatic Federal Consistency Determination
Central Valley streamflow	As ecosystem improvements increase spring and summer flows from upstream areas into reservoirs, develop a cooperative program to allow these flows to pass downstream into and through the Delta. (This action would result from recommendations for spring flow events and minimum flows from upstream ecological zones)	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Natural floodplain and flood processes	Convert leveed lands to tidal wetland/slough complexes.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Bay-Delta aquatic foodweb	Actions described to restore streamflow, floodplains, tidal wetlands and sloughs, and riparian habitat would increase primary and secondary productivity in the Suisun and North San Francisco Bay areas.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Tidal perennial aquatic	Develop a cooperative program to acquire and restore 1,500 acres of shallow-water habitat in the Suisun Bay and Marsh Ecological Unit.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
	Develop a cooperative program to evaluate the feasibility of restoring shallow-water habitat in the San Pablo Bay Ecological Unit.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Nontidal perennial aquatic	Develop a cooperative program to acquire and develop 400 acres of deeper open-water areas in restored saline emergent wetland habitats in the Suisun Bay Ecological Unit.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
	Develop a cooperative program to acquire and develop 400 acres of deeper open-water areas in restored saline emergent wetland habitats in both the Sonoma Creek and Petaluma River Ecological Units.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.

Ecosystem Element	Programmatic Action	Programmatic Federal Consistency Determination
	Develop 1,600 acres (includes above two actions) of deeper open-water areas to provide resting habitat for water birds, foraging habitat for diving ducks and other water birds that feed in deep water.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Saline emergent wetland	Develop a cooperative program to acquire, in fee-title or through a conservation easement, 7,500-12,000 acres for tidal restoration, and complete the needed steps to restore the wetlands to tidal action.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Seasonal wetland	Support the cooperative program to improve management of up to 26,000 acres of degraded seasonal wetland habitat in the Suisun Bay and Marsh Ecological Unit. Support the development of a cooperative program to improve management of up to 32,000 acres of existing seasonal wetland habitat in the Suisun Bay and Marsh Ecological Unit.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
	Develop a cooperative program to acquire, in fee-title or through a conservation easement, 1,000-1,500 acres of existing farmed baylands and restore tidal action.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
	Develop a cooperative program to acquire 100 acres of vernal pools and 500 to 1,000 acres of adjacent buffer areas (buffers could be in any category).	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
	Protect 6,200 acres of existing saline emergent wetlands in the Suisun Bay and Marsh Ecological Management Zone.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Tidal Sloughs	Restore slough habitat for fish and associated wildlife species. Restore 35 miles of slough habitat in the near-term, and 70 miles of slough habitat in the long-term.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.

Ecosystem Element	Programmatic Action	Programmatic Federal Consistency Determination
Riparian and riverine aquatic	Coordinate with landowners and managers to restore and maintain 10 to 15 linear miles of riparian habitat along corridors of riparian scrub and shrub vegetation in each of the ecological units, of which 60% is more than 15 yards wide and 25% is no less than 5 yards wide and 1 mile long.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Perennial grassland	Develop a cooperative program to restore 5,000 acres of perennial grasslands by acquiring conservation easements or purchasing land from willing sellers.	Programmatically consistent with policies regarding fish and wildlife, freshwater inflow, water quality, and wetlands. Project-level consistency determination for policies pertaining to construction, dredging and fill activities.
Delta smelt	Restoration of delta smelt will come indirectly from increasing March to May Delta inflow and outflow, improving Delta water temperature, improving Delta channel hydraulics, improving the Delta aquatic foodweb, improving aquatic wetland, and riparian habitats, and reducing stressors including effects of water diversions and contaminants.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
Longfin smelt	Restoration of longfin smelt will come indirectly from: improved Delta inflow and outflow, improving the Delta aquatic foodweb, improving aquatic wetland, and riparian habitats, and reducing stressors including the effects of water diversions and contaminants.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
Splittail	Restoration of splittail will come indirectly from higher late-winter Delta inflow, improving the Delta aquatic foodweb, improving aquatic wetland, and riparian habitats, and reducing stressors including effects of water diversions and contaminants.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
Sturgeon, green and white	Sturgeon restoration will come indirectly from increased streamflows, improving the Delta aquatic foodweb, and reducing stressors including effects of water diversions and contaminants.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
Chinook salmon (general)	Chinook salmon population restoration will come indirectly from increasing late winter and spring Delta inflow and outflow, improving Delta channel hydraulics, improving the Delta aquatic foodweb, increasing shallow water, riparian, and wetland habitats in the Delta, and reducing stressors including effects of water diversions and contaminants.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.

Ecosystem Element	Programmatic Action	Programmatic Federal Consistency Determination
Striped bass	Restoring striped bass will come indirectly from increasing late winter and spring Delta inflow and outflow, improving Delta channel hydraulics, improving the Delta aquatic foodweb, increasing shallow water, riparian, and wetland habitats in the Delta, and reducing stressors including effects of water diversions and contaminants.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
American shad	Restoration of American shad populations will come indirectly from increasing spring fresh water inflow to the Bay-Delta and improving the Delta aquatic foodweb.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
Resident fish species	Restoration of native resident species will come from improved acquatic habitats and foodweb	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
Marine/estuarine fishes and large invertebrates	General programmatic actions that will contribute to the target include improving winter/spring Delta outflow, restoring tidal wetland habitat, improving the aquatic foodweb, reducing losses of larvae and juvenile marine/estuarine fishes at water diversions in the Bay and Delta, limiting the introductions of non-native species, and reducing the input of toxic substances into Central Valley waterways.	Programmatically consistent with fish and wildlife policies, freshwater inflow policies, and water quality policies.
Swainson's hawk	Restore riparian woodlands and improve wildlife habitat values on agricultural lands. (Note: Please refer to the implementation objectives, targets and programmatic actions in the Habitat section of the Sacramento-San Joaquin Delta Ecological Zone for acreages and general areas for restoration of riparian, perennial grassland, and agricultural lands.)	Programmatically consistent with wildlife policies.
California clapper rail	Restoring tidal emergent wetland habitat would indirectly benefit California clapper rail population.	Programmatically consistent with wildlife policies.
California black rail	Restoring tidal emergent wetland habitat would indirectly benefit California black rail population.	Programmatically consistent with wildlife policies.
Suisun song sparrow	Restoring tidal wetlands and and improved riparian habitat will benefit this species.	Programmatically consistent with wildlife policies.

Ecosystem Element	Programmatic Action	Programmatic Federal Consistency Determination
Giant garter snake and western pond turtle	Restoration of new habitats in historical wetlands, grasslands, and upland areas will aid in the recovery of these species.	Programmatically consistent with wildlife policies.
Lange's metalmark, delta green ground beetle, VELB	Habitat restoration will contribute to the recovery of these species.	Programmatically consistent with wildlife policies.
Salt marsh harvest mouse	Restoring salt marsh habitat in San pablo and Suisun Bays and adjacent marshes, and new and improved salt marsh habitat in the north Bay and adjacent marshes will help in recovery of this species.	Programmatically consistent with wildlife policies.
Shorebird and wading bird guild	Shorebirds and wading birds will indirectly benefit from restoration of wetlands and tidal and non-tidal perennial aquatic habitat.	Programmatically consistent with wildlife policies.
Waterfowl	Waterfowl will indirectly benefit from restoring sloughs, wetlands, riparian, and tidal and non-tidal perennial aquatic habitat.	Programmatically consistent with wildlife policies.
Water diversion	Develop a cooperative program to consolidate, screen, or eliminate diversions in the Suisun Marsh/North San Francisco Bay Ecological Zone.	Programmatically consistent with fish and wildlife policies.
Invasive aquatic plants	Conduct large-scale, annual weed eradication programs throughout existing and restored dead-end and open-end sloughs and channels in each ecological unit so that less than 1% of the surface area of these sloughs and channels is covered by invasive non-native aquatic plants within 10 years.	Programmatically consistent with fish and wildlife, and general environmental policies.
Invasive riparian and salt marsh plants	Develop a cooperative program to remove and suppress invasive non-native plants that compete with native riparian vegetation by reducing the area occupied by these species (such as giant reed and eucalyptus) by 50%.	Programmatically consistent with fish and wildlife, and general environmental policies.
	Develop a cooperative approach to develop contol measures for perennial pepperweed.	Programmatically consistent with fish and wildlife, and general environmental policies.
	Develop a cooperative program to eliminate invasive woody plants from restoration sites to protect native riparian vegetation.	Programmatically consistent with fish and wildlife, and general environmental policies.
Invasive aquatic organisms	Fund additional inspection staff to enforce existing regulations.	Programmatically consistent with fish and wildlife, and general environmental policies.

Ecosystem Element	Programmatic Action	Programmatic Federal Consistency Determination
	Help fund research on ballast water treatment techniques that could eliminate non-native species before ballast water is released.	Programmatically consistent with fish and wildlife, and general environmental policies.
	Provide funding to the California Department of Food and Agriculture to expand or establish, as appropriate, a comprehensive program to exclude, detect, and manage invasive aquatic species such as zebra mussel, purple loosestrife, and hydrilla.	Programmatically consistent with fish and wildlife, and general environmental policies.
Predation and competition	Limit striped bass supplementation to life stages that minimize predation on juvenile anadromous and estuarine fish.	Programmatically consistent with fish and wildlife policies.
	Cooperatively develop an ecologically based approach to limit striped bass and chinook salmon stocking in the Bay to areas and periods that will not increase predation rates on special-status species, such as longfin smelt and delta smelt, and other native fishes.	Programmatically consistent with fish and wildlife policies.
Contaminants	Reduce the impacts of herbicides, pesticides, fumigants and other agents toxic toxic to fish and wildlife in the Suisun Marsh/North San Francisco Bay Ecological Management Zone.	Programmatically consistent with water quality policies.
Harvest of fish and wildlife	Provide additional funding to California Department of Fish and Game (DFG) for additional enforcement.	Programmatically consistent with fish and wildlife policies.
	Provide additional funding to county sheriff's departments and State and local park agencies to support additional enforcement efforts.	Programmatically consistent with fish and wildlife policies.
	Provide rewards for the arrest and conviction of poachers, and develop and implement a public outreach/education program regarding the illegal harvest.	Programmatically consistent with fish and wildlife policies.
Disturbance	Develop a cooperative program with local agencies to establish and enforce zones prohibiting boat wakes within 50 yards of California black rail nesting areas in Suisun Marsh and San Francisco Bay from March to June.	Programmatically consistent with fish and wildlife policies.

Ecosystem Element	Programmatic Action	Programmatic Federal Consistency Determination
	Develop a cooperative program with local agencies to establish and enforce zones prohibiting motorized boats in 5 miles of dead-end channels in Suisun Marsh and San Francisco Bay from March to June	Programmatically consistent with fish and wildlife policies.
	Develop a cooperative program with local agencies to establish and enforce zones prohibiting motorized boats in new, small channels in restored tidal fresh emergent wetlands	Programmatically consistent with fish and wildlife policies.

area and volume, marshes and mudflats, and saltponds and other managed wetlands described above. The determination of consistency with shoreline effects must be made at the project level because these policies are fairly project specific. Specific mitigation measures for potential impacts, such as siltation during construction, will also be addressed at the project level.

The Ecosystem Restoration Program is consistent at a programmatic level with the Suisun Marsh Protection Plan policies pertaining to environment, water supply and quality, and land use and marsh management. The policies regarding utilities, facilities, and transportation are project specific and future consistency determinations on these policies will be provided at the project level. Additionally, it is too speculative at a programmatic level to assess consistency with the policies regarding water-related industry because there are no project-specific actions now planned near the Collinsville site. A consistency determination related to these policies will be made, as appropriate, at the project level in the event that restoration or enhancement actions are proposed at the Collinsville site.

The McAteer-Petris Act policies pertain primarily to dredging and fill activities in the San Francisco Bay area. The Ecosystem Restoration Program is consistent at a programmatic level with the policies that state that further filling in the San Francisco Bay area should be for water-oriented uses (e.g., wildlife) and that the nature, location, and extent of any fill should minimize harmful effects on water and wildlife resources in the San Francisco Bay area. Actions under the Ecosystem Restoration Program involving fill would be designed to enhance wildlife and aquatic resources; however, as with other policies in the San Francisco Bay Plan and the Suisun Marsh Protection Plan, more detailed assessment of consistency with these policies is appropriately determined at the project level (e.g., construction in accordance with safety standards).

Under BCDC's statutes, there are three coastal resource areas for which the effects of CALFED actions must be identified: vegetation and wildlife, water quality, and water inflow/quantity. The effects of implementing ERP actions on these three resource areas are described below. Where there is the potential for significant adverse impacts resulting from implementation of the CALFED programmatic actions, these impacts, as well as potential mitigation measures, are discussed.

4.2.1.1 Beneficial Effects on Vegetation and Wildlife. Implementing ERP actions would result in beneficial effects on vegetation and wildlife as a result of the restoration of aquatic habitat and adjacent communities, including riparian, shallow-water, and tidal marsh habitats. Other beneficial effects will result from actions (including establishing dredging guidelines, implementing plans to reduce erosion attributable to boat wakes, reducing input of contaminants upstream and in San Francisco Bay) that reduce stresses on the processes and structure of those communities. The Environmental Water Account (EWA) will provide instream flows when they are critical for flow-dependent species. Primary beneficial effects include restored sediment supply and movement processes; restored natural structural characteristics of the San Francisco Bay system; and restored biological productivity through increased production, reduced stress on production processes, and increased input of organic carbon.

Additionally, reoperation of reservoir and diversion facilities may provide Delta outflows that protect and enhance the ecological functions and processes that operate within the Bay. Flow changes

could benefit all Bay species. Beneficial impacts on species include increases in the abundance of spawning and rearing habitat and increases in species survival as a result of reductions in levels of contaminants and potential increases in the availability of food.

Implementing ERP actions is expected to result in the following beneficial effects:

- **Increase in Open-Water and Wetland Habitat Area.** Implementing ERP actions would substantially increase the area of wetland habitats in the Bay Region, including brackish water habitat in Suisun Marsh. Specific benefits would include increased availability of suitable breeding and/or foraging habitat for waterfowl and water birds, shorebirds, and wading birds dependent on the Delta.

- **Increase in Riparian Communities.** Implementing ERP actions would substantially increase the area of riparian habitats in the Bay Region. Specific benefits would include increased availability of suitable breeding and/or foraging habitat for a number of birds, mammals, reptiles, and amphibians.

- **Improved Wetland Habitat Quality.** Implementing ERP actions would improve the quality of as many as 14,000 acres of existing degraded diked saline emergent and seasonal wetland habitat areas. Approximately 81 species of wildlife in the Bay Region could benefit.

- **Improved Habitat Patterns.** Implementing ERP actions would create a historical pattern of open-water, wetland, riparian, and grassland habitats in the Bay Region. Restoring wetlands near agricultural lands would create a pattern that could potentially increase the distribution of Bay Region wildlife.

- **Improved Connectivity of Riparian Habitat.** Implementing ERP actions would restore up to approximately 60 miles of riparian habitat along channels and sloughs. Restoring habitat would increase the connectivity between existing fragmented riparian areas in the Bay Region.

- **Increase in Habitats for Special-Status Species.** Aquatic, riparian, and some grassland habitats would be improved as a result of implementing ERP. Special-status species would benefit from these habitat improvements.

- **Expansion of Rare Natural Communities and Significant Natural Areas.** The increase in quantity, quality, and connectivity of aquatic, riparian, and grassland habitats through implementation of the ERP would provide similar increases in most of the Bay Region's rare natural communities and significant natural areas.

4.2.1.2 BENEFICIAL EFFECTS ON FRESHWATER INFLOWS. Implementing ERP actions would also have beneficial effects on freshwater inflows to San Francisco Bay, Suisun Marsh, and Suisun Bay. One of the fundamental objectives of the ERP is to restore basic hydrologic conditions to Central Valley

streamflows to reactivate and maintain ecological processes that create and sustain habitat required for healthy fish, wildlife, and plant populations. The CALFED programmatic action to implement this objective is to develop a cooperative program to provide target flows in dry and normal years by allowing inflows to major storage reservoirs to pass downstream into and through the Delta. To further this goal, the Environmental Water Account will be used to provide instream flows at critical times for flow-dependent species. Although intended primarily to benefit in-Delta fisheries, EWA water could provide water quality benefits to the Bay by increasing Delta outflows. Restoring freshwater flows into the Suisun Marsh/North San Francisco Bay Ecological Zone consistent with natural hydrologic conditions in the Bay-Delta watershed will help restore fundamental ecosystem processes and functions for the north Bay's aquatic and wetland resources.

4.2.1.3 Potentially Significant Adverse Impacts/Mitigation Measures Related to Vegetation and Wildlife. Implementing the ERP could result in the temporary loss or degradation of wetland and riparian communities during construction, although the ultimate aim of the program is to significantly improve habitats in the Bay Region. This potential impact is considered significant because temporary decreases in the area of and disturbance to these communities could adversely affect approximately 82 species of wildlife associated with wetlands and 114 species of wildlife associated with riparian habitat in the Bay Region (including Suisun Marsh and Bay and northern San Pablo Bay). Potential mitigation strategies for reducing temporary impacts on wetland and riparian communities could include avoiding wetland and riparian habitats, creating wetland and riparian habitats in nonwetland/riparian habitat areas to offset temporary habitat losses, and restoring disturbed wetland and riparian vegetation immediately following construction activities.

4.2.1.4 Potentially Significant Adverse Impacts/Mitigation Measures Related to Water Quality. The ERP involves restoration of approximately 150,000 acres of terrestrial and aquatic wildlife habitat. Up to 22,000 acres of the restored habitat could be created in the Bay Region, particularly in the Suisun Marsh and North Bay (see Table 2). Two categories of potential effects on water quality are associated with implementing ERP programmatic actions: immediate water quality impacts resulting from construction activities and long-term water quality impacts.

Habitat restoration would involve large-scale construction operations affecting considerable areas of land and water. Large-scale construction activities could have adverse effects on water quality. Construction activities in waterways could greatly increase local water turbidity and, depending on the source of the material used for levee construction, could cause the release of nutrients, natural organic matter, and toxicants into the water column. Construction in areas of dry land could result in similar substances being washed into waterways during storms and other periods of high flow. Short-term local adverse changes in water quality in the immediate vicinity of construction sites can be expected, but it is not expected that regional-level water quality or beneficial uses would be affected by construction activities.

Implementing ERP actions would improve long-term water quality in a number of areas. Land conversion from agricultural uses to wildlife habitat in the Bay Region, particularly lands adjacent to Suisun Bay and Marsh, San Pablo Bay, the Napa and Petaluma Rivers, and Sonoma Creek, would reduce

discharges of soil particles, nutrients, and pesticides into the waters of the Bay-Delta system, resulting in a beneficial effect on instream water quality. The input of salts would remain about the same as under existing conditions, although salt concentrations in Delta channels and other waterways would increase as a result of increased evaporation rates on Delta islands converted to year-round wetland habitats. It is not yet known whether total organic carbon (TOC) discharges would increase or decrease as a result of habitat restoration. If TOC discharges increase, then the TOC content of Delta waters would rise, making them less suitable as a source of drinking water. Restoration of riparian corridors and emergent wetlands would increase shading of water surface. Water temperatures in small tributary streams would decrease. The exclusion of livestock from riparian areas may reduce the microbial content of stream waters and increase their suitability for water-contact recreation and as a raw water supply source.

Large-scale construction activities will be chosen to minimize adverse environmental impacts. Any short-term adverse changes in water quality are expected to be less than significant because they would be temporary, reversible, and local.

A potential long-term adverse water quality effect of ERP could be an increase in water salinity attributable to increased evaporation where agricultural croplands are converted to wildlife habitat; however, salinity could also be decreased on these lands due to reduction or elimination of salts applied through fertilizers. Also, long-term water quality benefits would result from the decreased discharge of nutrients and pesticides to the waters of the Bay-Delta system.

If conversion of agricultural land into aquatic habitat increases the TOC content of Bay-Delta system waters, the suitability of this water for use as drinking water would decrease and the cost of water treatment would increase; however, any adverse effects could be mitigated by locating at least some aquatic habitat restoration projects in areas where increases in TOC discharges would not affect drinking water diversions or by treatment of peat soils to reduce TOC discharges.

4.2.2 Water Quality Program

The Water Quality Program is programmatically consistent with the water quality policies of the San Francisco Bay Plan and the Suisun Marsh Protection Plan. The source controls (e.g., BMPs) and treatment methods described in the program are designed to address water quality problems in the Delta associated with urban and industrial runoff, municipal and industrial wastewater, and agricultural drainage. These actions will have beneficial effects on water quality. The polices of the McAteer-Petris Act do not apply to this program because fill activities in the San Francisco Bay area are not being contemplated as a part of this program.

4.2.3 Water Use Efficiency Program

The Water Use Efficiency Program is programmatically consistent with the policies of the San Francisco Bay Plan and the Suisun Marsh Protection Plan. Although no specific actions are proposed that

would directly affect coastal zone resources within the jurisdiction of BCDC, local efforts designed to increase water use efficiency are expected to have beneficial effects on water resources. The polices of the McAteer-Petris Act do not apply to this program because fill activities in the San Francisco Bay area are not being contemplated as a part of this program.

4.2.4 WATER TRANSFER PROGRAM

The Water Transfer Program consists of administrative actions that would not directly affect areas within the jurisdiction of the BCDC. Changes in flow amount from the Program would not likely be significant (see Section 4.1.4). Thus, the Program would be consistent with the San Francisco Bay Plan and the Suisun Marsh Protection Plan. The polices of the McAteer-Petris Act do not apply to this program because fill activities in the San Francisco Bay area are not being contemplated as a part of this program.

4.2.5 LEVEE SYSTEM INTEGRITY PROGRAM

The current Levee System Integrity Program includes work only in the Delta, and would have no direct physical construction impacts on the Coastal Zone. Rehabilitation of levees in the Suisun Marsh area may be added to the Program, subject to a feasibility report. Should Suisun Marsh levees be added to the Program, reconstruction efforts in the Suisun Marsh area could result in short- and long-term adverse effects due to habitat encroachment and loss. These impacts can be reduced or mitigated by setting back levees and constructing channel-side berm and levee remnants, which would allow development of natural marsh communities, and produce beneficial impacts on aquatic characteristics.

Waterside construction activities could result in short-term effects on water quality. Local increases in TSS content of adjacent waters can be expected, with increases in TOC also possible. Toxic substances contained in old levees or channel sediments could be released during waterside work or dredging. A number of mitigation measures relating to construction practices can reduce potential water quality impacts, including: use of cofferdams to isolate construction sites from waterways; using sediment curtains to contain sediment plumes during dredging; avoiding construction activities during periods of fish presence; and using best management practices to control erosion and sedimentation.

By using best management practices and other mitigations, as well as by creating additional marsh habitat, potential levee program actions to protect Suisun marshes and infrastructure would be consistent with the Suisun Marsh Protection Plan, the San Francisco Bay Plan and the McAteer-Petris Act.

4.2.6 WATERSHED PROGRAM

Most Watershed Program activities would not have direct, physical effects on the Coastal Zone. Program actions would, however, have beneficial impacts to the Bay through upstream activities that improve Bay water quality, result in a closer approximation of natural flows, and restore natural sediment delivery and movement. If Program activities are funded for watersheds within the jurisdiction of the

U

USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
UV	Ultra violet

V

VAMP	Vernalis Adaptive Management Plan

W

WMS	Water Management Strategy
WUE	Water Use Efficiency Program

X

X2	Location (measured in kilometers upstream from the Golden Gate Bridge) of 2 parts per thousand total dissolved solids

Y

yr	year

N

NCCP	Natural Community Conservation Plan
NCCPA	Natural Community Conservation Planning Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NRCS	Natural Resources Conservation Service

O

Ops Group	California-Federal Operations Group

P

PL	Public Law
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
Program	CALFED Bay-Delta Program

R

"R" species	"recovery"
"r" species	"contributes to recovery"
Reclamation	U.S. Bureau of Reclamation
ROD	Record of Decision

S

SB	Senate Bill
SJRA	San Joaquin River Agreement
SRF	State Revolving Fund
SWP	State Water Project
SWRCB	State Water Resources Control Board

T

TAF	thousand acre-feet
TBP	Temporary Barriers Program
TDS	total dissolved solids
TOC	total organic carbon

E

E/I Ratio	Export/Inflow Ratio
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ERP	Ecosystem Restoration Program
ESA	Endangered Species Act
EWA	Environmental Water Account
EWMP	efficient water management practices

F

FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FWCA	Fish and Wildlife Coordination Act
FWS	U.S. Fish and Wildlife Service

G

GLC	Grant Line Canal

I

ISI	Integrated Storage Investigation

J

JPOD	joint point of diversion

L

LESA	NRCS Land Evaluation and Site Assessment

M

"m" species	"maintains"
M&I	municipal and industrial
MAF	million acre-feet
mg/L	milligrams per liter
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSCS	Multi-species Conservation Strategy
MWD	Metropolitan Water District of Southern California
μg/L	micrograms per liter

Common Acronyms

A

AB	Assembly Bill
AFRP	Anadromous Fish Restoration Program
ASIP	Action-specific implementation plan
AWMC	Agricultural Water Management Council

B

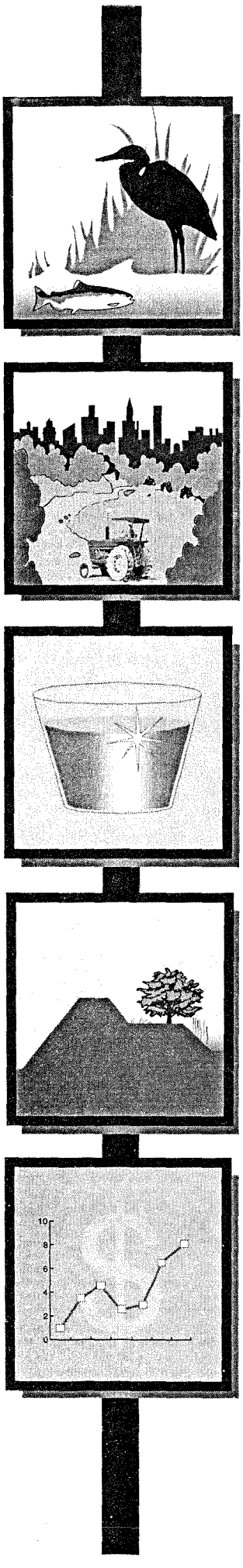
Bay-Delta	San Francisco Bay/Sacramento-San Joaquin Delta estuary
BCDC	San Francisco Bay Conservation and Development Commission
BDAC	Bay-Delta Advisory Council
BLM	U. S. Bureau of Land Management
BMPs	best management practices

C

CalEPA	California Environmental Protection Agency
CARA	Conservation and Reinvestment Act
CCFB	Clifton Court Forebay.
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	cubic feet per second
CMARP	Comprehensive Monitoring Assessment and Research Program
COA	Coordinated Operations Agreement
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CZMA	Coastal Zone Management Act

D

DCC	Delta Cross Channel
DEFT	Diversion Effects on Fisheries Team
DFG	California Department of Fish and Game
DHS	California Department of Health Services
DO	dissolved oxygen
DWR	California Department of Water Resources
DWRSIM	DWR system operational model



CALFED
BAY-DELTA
PROGRAM

Attachment 10
Common Acronyms

August 28, 2000

Of the proposed CALFED programs, only the Ecosystem Restoration Program and potentially the Levee System Integrity Program would have direct physical impacts on areas within the San Francisco Bay portion of the Coastal Zone. Both these programs are designed to improve the water quality of the Bay and to provide substantial enhancements for species inhabiting and transiting through the Bay region. Both Programs would mitigate any potential impacts in the Bay region.

The Storage and Conveyance elements of the CALFED Program may have some effects on X2 and estuary biota which depend on brackish marsh conditions. If winter flows to the Bay are reduced slightly due to increased storage or conveyance improvements, there is concern that salt marsh could expand at the expense of brackish marsh. Current information suggests that this would not occur. Such effects, however, cannot be measured or estimated at the current programmatic level of the Program, and will need to await additional monitoring and research information, both of which are proposed as part of the overall Program.

5.0 NEXT STEPS

Project-specific actions, undertaken during Phase III of the CALFED process, may include federal agency involvement in projects proposing to deposit fill in; extract materials from; or change the use of water, land, or structures in or around San Francisco or Suisun Bays and therefore will require project-specific compliance with CZMA. Federal agencies may be required to prepare federal consistency analyses certifying that the proposed project-specific actions are consistent with BCDC's coastal zone management program. BCDC would either concur with the certifications or object to them (in the latter case the federal agencies must obtain approval from the secretary of commerce before the action commences). The environmental review for project-level actions that could affect coastal zone resources (requiring either the additional consistency analysis for federal actions or individual local coastal permits for nonfederal actions) will be tiered from the Programmatic EIS/EIR, and may be simplified because project descriptions of specific actions would already contain strategies (if necessary) to avoid and mitigate impacts on resources of the coastal zone.

6.0 REFERENCES

San Francisco Bay Conservation and Development Commission. 1969. San Francisco Bay Plan, as amended. January. San Francisco, CA.

San Francisco Bay Conservation and Development Commission. 1976. The Suisun Marsh Protection Plan. December. San Francisco, CA.

CALFED Bay-Delta Program. 1999. Draft Programmatic Enivronmental Impact Statement/Environmental Impact Report. June. Sacramento, CA.

- The change in outflow is partially attributable to capture of flow during high-flow conditions that will minimize the effects on ecosystem processes.

Additional project-level studies will be conducted as part of the planning for any storage projects to determine potential impacts to the Bay. Program activities to increase understanding of Delta outflow effects and the related shifts in salinity on organisms in the Delta and Bay are included in the ERP Strategic Plan and CALFED Science Program (CMARP).

Also, additional flows could be available from the Environmental Water Account, created through new storage, which would benefit anadromous and other species in the Bay region.

Because there are no direct impacts, because flow reduction impacts are not projected to be significant, and because additional flows may be available to benefit critical species at times when such flows are critical, the Storage Element would be consistent with the Suisun Marsh Protection Act, the San Francisco Bay Plan and the McAteer- Petris Act.

4.2.8 Conveyance- Preferred Program Alternative

The Preferred Program Alternative would implement a number of actions in the Delta that simultaneously are designed to improve water quality, allow for continued export, and allow for recovery of fish populations. No facilities would be contemplated in the San Francisco Bay portion of the Coastal Zone. Outflow reductions to the Bay are largely dependent on storage options chosen (see 4.2.7 above). As noted above, reduced flows to the Bay could range 340 to 700 TAF. This amount could be withheld from the average of 14.8 MAF that normally flow out of the Delta to the Bay, although flows historically have ranged between 4 to 70 MAF annually. In comparison to total annual flows, and given the probable timing of any flow reductions, the amount of reduction (2.3%-4.7%) is not significant, and would cause no adverse environmental impacts.

Because there are no direct impacts, because flow reduction impacts appear to be insignificant, and because additional flows may be available to benefit target species at times when such flows are critical, the Conveyance Element would be consistent with the Suisun Marsh Protection Act, the San Francisco Bay Plan and the McAteer- Petris Act.

4.3 CONCLUSION

The proposed CALFED Preferred Program Alternative programmatic actions are consistent with the Suisun Marsh Protection Act, the San Francisco Bay Plan and the McAteer-Petris Act. This will allow a finding by BCDC that the overall CALFED program is consistent with the Coastal Zone Management Act.

BCDC, they would be community-based, and would work with all local environmental protection laws and regulations, such as those administered by BCDC. Any on-the-ground projects within the BCDC jurisdiction would use mitigation measues similar to those described for the Ecosystem Restoration Program.

The CALFED Watershed Program is consistent at a programmatic level with the San Francisco Bay Plan's policies regarding fish and wildlife, water quality, freshwater inflow, water surface area and volume, marshes and mudflats, and saltponds and other managed wetlands described above. The determination of consistency with shoreline effects must be made at the project level because these policies are fairly project specific. Specific mitigation measures for potential impacts, such as siltation during construction, will also be addressed at the project level.

The McAteer-Petris Act policies pertain primarily to dredging and fill activities in the San Francisco Bay area. The Watershed Program is consistent at a programmatic level with the policies that state that further filling in the San Francisco Bay area should be for water-oriented uses (e.g., wildlife) and that the nature, location, and extent of any fill should minimize harmful effects on water and wildlife resources in the San Francisco Bay area. Actions under the Watershed Program involving fill would be designed to enhance wildlife and aquatic resources, stream health and water quality; however, as with other policies in the San Francisco Bay Plan and the Suisun Marsh Protection Plan, more detailed assessment of consistency with these policies is appropriately determined at the project level (e.g., construction in accordance with safety standards).

Watershed Program activities are not anticipated to occur in the Suisun Marsh; thus there would be no inconsistencies with the Suisun Marsh Protection Plan.

4.2.7 STORAGE

The Storage Investigation and potential development of storage facilities would not have a direct physical effect on the San Francisco Bay portion of the Coastal Zone, as no construction will occur within the Coastal Zone. By intercepting flows that would otherwise have flowed through the San Francisco Bay, however, flow amounts that reach the Bay may be reduced. Depending upon storage options chosen, between 340 and 700 TAF could be retained as a result of storage.

This flow reduction is not anticipated to result in significant environmental impacts to the Bay ecosystem, based on:

- Operations criteria are in place that will maintain minimum Delta outflow during the critical February through May period;

- The change in outflow (2.3%-4.7% decrease) is small relative to the variability in outflow from month-to-month and year-to-year;

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