DISAPPROVED BY AUTHORITY

CALFED Bay-Delta Program

Ecosystem Restoration Multi-Year Program Plan (Years 6-9) and Year 6 Annotated Budget

(State FYs 2005-06 to 2008-09; Federal FYs 2006 to 2009)

Implementing Agencies:
California Department of Fish & Game
United States Fish & Wildlife Service
NOAA's National Marine Fisheries Service

The May Revision of the Governor's FY 2006 budget identifies three key activities for the CALFED Program that are to be accomplished by November 1, 2005. They are: an independent program and fiscal review; a re-focusing of the efforts of the California Bay-Delta Authority and the other CALFED state agencies; and the development of an action plan for long-term financing.

The outcome of these three activities likely will have considerable impact on how the CALFED Bay-Delta Program is implemented and financed in succeeding years. Therefore, although this Program Plan describes activities that are anticipated to occur during the next four years, the Authority is being asked to approve it based only on those activities scheduled to occur during FY 2006.

August 2005

CALFED BAY-DELTA PROGRAM

Goals, Objectives and Targets

The California Bay-Delta Authority Act requires implementing agencies to each year develop their annual program plan and proposed budget for the following budget year; this program plan and proposed budget describes how each implementing agency proposes to carry out their respective program elements during the following year. The plans are submitted to the director of the California Bay-Delta Authority (Authority). Each program plan and proposed budget must include program priorities, work plans, proposed budgets, and significant program products. Annually, the Authority reviews and approves and, if appropriate, recommends modifications to the program and expenditure plans based on consistency and balanced achievement of the goals and objectives of the Program.

This Ecosystem Restoration Multi-Year Program Plan (Years 6-9) and Year 6 Annotated Budget identifies the CALFED Bay-Delta Program's (Program) priorities for years 6-9 based on the goals, objectives, and targets for the Program that were identified in the Ecosystem Restoration Program Plan (Volumes I,II, II). Additionally, activities were prioritized as a result of current issues such as the declining Delta pelagic species. This Multi-Year Program Plan serves as the vehicle to meet the above stated requirements, which includes the annual planning and budget document known as the Annotated Budget for implementing the Single Blueprint for Ecosystem Restoration (referred to as the Single Blueprint document) in Table 3 of the major activities section. The years referred to in this document, e.g., Year 6, correspond with the State fiscal year (July to June) beginning with the year the Record of Decision was signed (2000-2001 State fiscal year, or Year 1); the Federal fiscal year is October to September.

The CALFED Programmatic Environmental Impact Statement/Report (PEIS/R) identified six strategic goals for the Ecosystem Restoration Program (ERP) to meet over the 30-year or more course of the Bay-Delta Program (see Appendix A). Strategic goals broadly define the scope and purpose of the ERP and provide the basis for a vision of a restored Bay-Delta system. These strategic goals guided how strategic objectives and targets are developed and are used to evaluate proposed restoration actions. Strategic objectives are listed for each goal. Strategic objectives are used to assess progress in achieving the ERP goals. Strategic objectives were used to develop and organize targets and programmatic actions. Targets are qualitative or quantitative statements of a strategic objective, and as such are designed to be more flexible than the strategic objective and will change as new information and progress indicates the need for change. Targets reflect the adaptive management principle, that is, as new information is developed, targets may change—adapt—to achieve the objective or goal. Actions are those measures designed to meet the specific target; actions are also subject to adaptive management and can change to meet the target. Currently, there are more than 300 targets and 600 programmatic actions described for the ERP. For more information about ERP's strategic goals, objectives, targets and programmatic actions, please see the Ecosystem Restoration Program Plan, Volume III (ERP Strategic Plan), of the CALFED PEIS/R. (Available at http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemVol3RestorationPlan.shtml)

The Record of Decision for the CALFED PEIS/R (ROD) (available at http://calwater.ca.gov/Archives/GeneralArchive/RecordOfDecision2000.shtml) incorporated 119 milestones contained in the endangered species programmatic biological opinions and Natural Community Conservation Plan Approval for the CALFED Program. The milestones, developed primarily from targets or actions in the ERP Plan and Water Quality Program (WQP) Plan, were those actions the fish and wildlife agencies expected would be implemented during Stage 1 (the first seven years of the 30-year program) to contribute towards CALFED's conservation goals.

The ERP has a long-term approach to reviewing and revising targets, actions and milestones. The long-term approach is part of the ERP's regional planning effort, such as the Delta Regional Ecosystem Restoration Implementation Plan (DRERIP). Work on DRERIP includes convening a panel of experts to help examine the ERP's actions, targets, and milestones for the Delta; this process includes review by the ERP Science Board and ERP Implementing Agencies (California Department of Fish and Game, U.S. Fish and Wildlife Service, and NOAA's National Marine Fisheries Service (NMFS) as well as opportunity for public and stakeholder input through public workshops and the DRERIP webpage (http://www.delta.dfg.ca.gov/erpdeltaplan/). (Throughout this report, the term "ERP Agencies" will be used for the collaborative efforts by the ERP Implementing Agencies and CBDA staff.) The regional planning process will be the primary forum for revising ERP targets.

The ERP Agencies completed an assessment of progress toward achieving the milestones and the efficacy of the Environmental Water Account (EWA) in September 2004. This assessment supported the reinitiation of consultation for the Bay-Delta Program. To ensure that the ERP is being implemented in a manner and to an extent sufficient to sustain programmatic Federal Endangered Species Act, California Endangered Species Act, and NCCPA compliance for all CALFED Program elements, the ERP Agencies compiled information on projects funded by CALFED or closely related programs (i.e., which milestones were addressed by each project, and accomplishments of each project). A "big picture" synthesis of the current status, progress of milestones (i.e., milestones completed, ahead of schedule, on-schedule, or behind schedule) and next steps was included in the assessment document. The Milestones Assessment documents may be accessed through DFG's Environmental Compliance webpage (http://www.delta.dfg.ca.gov/envcomp/milestones.asp). The results of the Milestones Assessment were used by the ERP Agencies in developing this program plan. The milestones assessment activity involved input by the ERP Science Board and stakeholders. Information from the assessment process will help in setting ERP priorities for the ERP multi-year work plans, proposal solicitations, and directed actions in future years. A follow-up evaluation of progress toward meeting the milestones is scheduled for summer 2005.

This Multi-Year Program Plan also serves as the Year 6 Annotated Budget for Implementing the Single Blueprint for Restoration and Recovery (Annotated Budget). The Annotated Budget is used by the ERP Agencies to guide their project funding decisions for a particular year and includes information about both State and Federal funding for projects that help achieve ERP goals and objectives.

Performance Measures

Performance measures translate program goals and objectives into measurable benchmarks of success. Performance measures range from relatively simple metrics to complex cross program assessments. As such, current work on performance measures includes counting the simple metrics and laying the technical and scientific groundwork that will allow us to perform more complex assessments later. The Program Annual Report tracks ERP progress using the performance measures described below.

The Science Program has articulated the following three levels of performance measures. These will be refined as they are tailored for the unique needs of each program. For the ERP, examples of performance measures include:

- Level 1: Simple administrative measures. Reports of funding allocations (such as number of dollars spent and the number of projects funded). The target for this level of performance is the annual allocation of $150 million to projects that meet ERP goals and objectives. The main source for this information, in addition to the ERP guiding documents, is the CALFED Annual Report and the Multi-Year Program Plan (MYPP). Annual appropriations are indicated in the MYPP cross-cut budget and adjusted by the annual report, which reflects how much of the appropriated funds were actually committed to ERP actions. ERP activities that support this level include developing an ERP database that can be used to evaluate administrative and financial aspects of ERP actions such as funds expended by individual projects by different Implementing Agencies, topic, species, geographic location, funding source, or acquired acreage. Another activity to support this level of measurement is the re-direction or dedication of a staff to ERP to track invoices, fund encumbrances, and work with external contract managers to oversee appropriate contractual agreements with project proponents.
- Level 2: Quantifiable accomplishments directly related to program actions (targets). Measures that track the direct results of implementing projects (such as miles of stream restored, acres of habitat protected, or numbers of fish screens installed). The targets for this level of assessment vary according to ERP region and goal. The main source for this information is the Milestones Assessment document for this year's MYPP. The Milestones Assessment completed in September 2004 will help focus on measures useful in reaching program goals and objectives as these relate to species of concern, critical ecological functions to those species, and stressors that affect those species. This information is tracked in the ERP database by project.

  The Terrestrial and Amphibian Monitoring Program (TAMP), for monitoring the terrestrial aspects of the ERP at a regional scale, was designed to incorporate data from existing long-standing monitoring programs such as the Interagency Ecological Program (IEP) and that information could be used for any level of performance measurement. Consequently, when indicators are selected, the long-term data set collected by long-standing monitoring programs such as IEP will be a valuable resource for the status and trend analyses need for developing and evaluating indicators. An aquatic monitoring program counterpart for regional monitoring is being developed by the Science Program. After significant progress is made on the aquatic monitoring program, the two programs will be integrated to assure appropriate coverage of interfacing and interacting aquatic and terrestrial habitats, species, and ecological processes.

- Level 3: Indicators related to program goals. Indicators that track responses to projects, or groups of projects, especially in relation to program goals and objectives (such as delta smelt adult abundance indices, spawning gravel recruitment, or salmon spawning escapement).

  The ERP and the Science Program are developing guidelines for CBDA program managers in selecting performance indicators. In providing a common guideline in picking performance measures specific to a program, it may be possible to expand the selections to include representative performance measures for the entire CBDA program. Components to be developed in support of the selection rationale that accompanies each performance measure includes:

  - A statement of the program goal and associated objective
  - The selected indicator expected to track the program's progress in reaching the goal or objective;
  - One or more metrics by which the state of the measure is determined;
  - A conceptual model demonstrating the relationship of the indicator to the program goal and associated objective;
  - A defined target or range for the measure to achieve; and
  - A description of, and where possible, a method for isolating the effects of other activities that may affect the metric.

The ERP invested much effort in how to develop ecological indicators and meaningful measures of program progress. For Year 4, Levels 1 and 2 are reported in the Accomplishments section of this document; the *ERP Project Evaluation Phase 2 Report (Look Back Exercise)* chronicles these performance measures for years 1-3. Also during Year 4, the ERP conducted an assessment of program progress towards achieving milestones called *Reinitiation of Consultation: Assessing Progress Towards Milestones and the Efficacy of the Environmental Water Account*. This assessment was primarily a process of verifying the linkages of projects to milestones and was solely based on a review of project documents such as proposals and contracts. No on-site verification was conducted because of time constraints. Approximately one-third of the milestones are written in a manner that can be measured or quantified, and when available in the project documentation, information was recorded relating to those quantifiable objectives.

The objective for Year 5 was to continue the assessment of progress towards milestones, beginning with developing protocols to measure the quantifiable information required by the milestones in a consistent and repeatable manner; these measurement protocols would then been applied to projects in the field. This data will be used in annual assessments of progress toward achieving the milestones. The annual assessment of progress towards achieving the milestones is due by December 15.

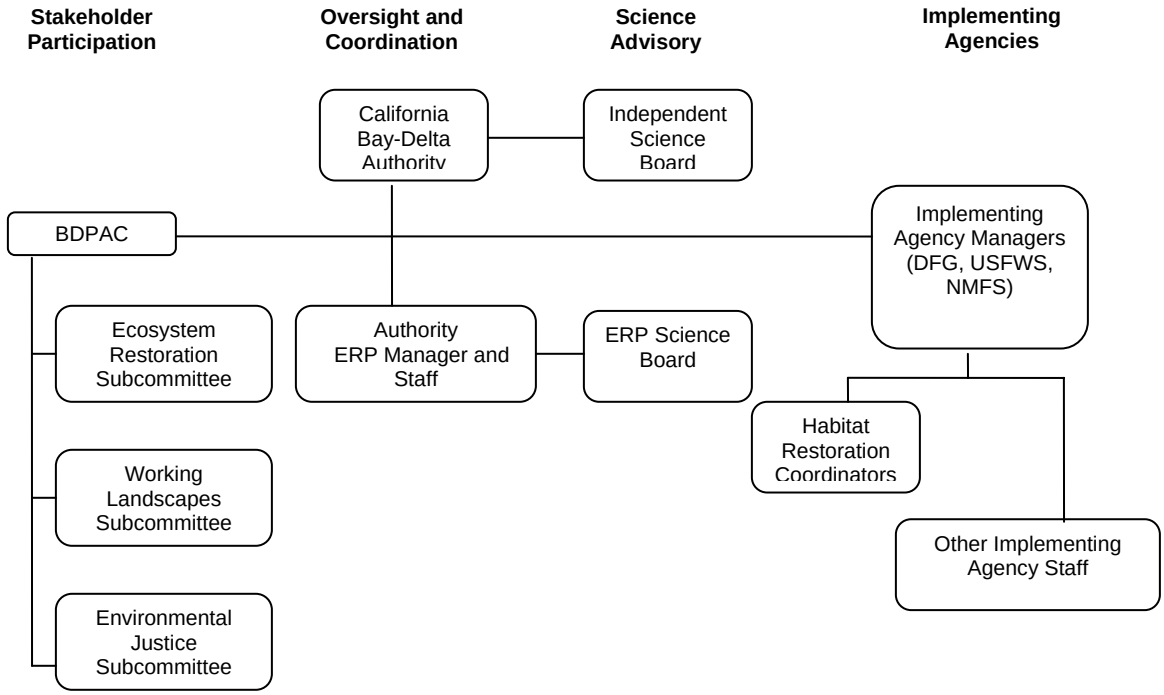
Although Level 3 ERP indicators have been in development for several years, significant work remains. The ERP Agencies—collaborating with CBDA ERP and Science Program staff, ERP Science Board, the Interagency Ecological Program (IEP) and other agencies—are taking a lead role in developing these indicators and associated monitoring protocol. Past indicator development efforts will be taken into consideration as the ERP Agencies integrate indicators supported by current conceptual models with ongoing monitoring results by existing programs such as DFG's Resources Assessment Program. The goal is to carry out specific aquatic and terrestrial monitoring needed to accurately track the success of the ERP beginning in Year 7. One ERP focused effort that contributes to this effort is the conceptual models being developed as part of the DRERIP and Suisun Marsh regional planning processes. The conceptual models will help show the interrelationships between the selected indicators and performance measures with ERP actions. A conceptual

model also is being developed for dissolved oxygen in the Stockton Deep Water Ship Channel in the lower San Joaquin River. The dissolved oxygen conceptual model effort is in close coordination with the DRERIP.

Also in Year 5 the ERP asked the ERPSB to review past performance measure development efforts by ERP and the Science Program. This review will include evaluations of related indicator efforts such as Cal/EPA's Environmental Protection Indicators of California (EPIC) system, and the Bay Institute's Ecological Scorecard for the San Francisco Estuary as well as recent reviews regarding environmental indicator development. The ERPSB will then propose a template process and some sample indicators to assist the ERP and the Program at large. This indicator review effort is in coordination with the Program's Independent Science Board.

In Year 6 and beyond, the ERP will use the experience from the site assessments to refine specific measurement protocols and to assess how linkages in scale can be develop to correlate local environmental responses to projects with larger scale regional and system responses. The focus of this analysis will be on the statistical robustness of the collected data and the lessons learned from pilot programs like the Integrated Regional Wetlands Monitoring, funded by the Science Program, especially with respect to correlating the efforts of specific implementation projects on system level responses. The ERPSB will consider possible larger scale system simulations for use in policy and decision-making.

Program Structure



Agency	Roles and Responsibilities
California Bay Delta Authority (Authority)	• Oversight and coordination
California Department of Fish and Game (DFG)	• Implementing agency • Manages State Habitat Restoration Coordinators • Lead for ERP regional planning • Administers Section 1600 Stream Alteration Permits • Administers the California Endangered Species Act, and Natural Community Conservation Planning Act; oversees MSCS implementation and state endangered species compliance for listed fish, wildlife, and plant species
U. S. Fish and Wildlife Service (USFWS)	• Implementing agency • Manages Federal Habitat Restoration Coordinators • Lead for Environmental Water Program and Non-native Invasive Species Program • Administers the Federal Endangered Species Act, oversees MSCS implementation and federal endangered species compliance for listed non-anadromous fish and listed wildlife • Administers several restoration efforts under the Central Valley Project Improvement Act, including the Anadromous Fish Restoration Program and the Anadromous Fish Screen Program.

Agency	Roles and Responsibilities
NOAA's National Marine Fisheries Service (NMFS)	• Implementing agency • Administers the Federal Endangered Species Act, oversees MSCS implementation and endangered species compliance for listed anadromous fish
BDPAC Subcommittee	**Roles and Responsibilities**
Ecosystem Restoration Subcommittee	• Provides BDPAC with guidance and advice regarding ERP and related CALFED activities • Provides forum for information exchange, issue analysis, and fact-finding • Advises about ERP implementation, ERP regional restoration and implementation plans; ERP budgets, adaptive management activities, the Environmental Water Program, and cross-program coordination and integration
Working Landscapes Subcommittee	• Provides BDPAC with guidance and advice regarding working landscapes issues in ERP and CALFED related activities • Provides forum for information exchange, issue analysis, and fact-finding • Advises about strategies to enhance the sustainability of California agriculture while restoring the ecological health and improving water management of the Bay-Delta system, water quality, water supply reliability, and levee systems integrity.
Environmental Justice Subcommittee	• Provides BDPAC with guidance and advice regarding environmental justice issues in ERP and CALFED related activities • Provides forum for information exchange, issue analysis, and fact-finding • Advises about environmental justice issues related to CALFED Program annual plans, ways for CALFED to integrate environmental justice into project development, and solicit and consider diverse perspectives and recommendations form a broad public
Independent Science Review	**Roles and Responsibilities**
Ecosystem Restoration Program Science Board	• Provides independent scientific advice and guidance to the ERP • Assists with establishing a solid scientific and technical foundation for the ERP; scientific review, advice, and guidance; integrating ecosystem-based adaptive management into the ERP; engaging the scientific and technical questions that are at the root of policy issues; help set ERP priorities.

Accomplishments

This section briefly lists the accomplishments of the ERP during the previous year (Year 5).

Reinitiation of Consultation. Improving the status of endangered or threatened plants, animals and their habitats is one of the central commitments of the CALFED Program. This commitment is embodied in the 2000 CALFED Programmatic ROD and attendant regulatory agreements regarding actions of the ERP. To gauge progress toward the ERP's goal for recovery of at-risk species, the endangered species regulatory agencies identified 119 milestones in 2000 that were expected to be achieved by the end of the 7-year-long Stage 1. These milestones (see Appendix B) were derived from targets and actions articulated in the ERPP, Volume III.

In July 2004, the ERP Agencies completed a mid-Stage 1 assessment of progress toward achieving the 119 milestones listed in the ROD. The assessment considered 416 ERP contracts, 83 Watershed Program contracts, and 68 Central Valley Project Improvement Act contracts, and also contained an evaluation of the efficacy of the EWA. On September 30, 2004, the regulatory agencies concluded that the CALFED Program is meeting its substantial commitment to reviving California's Bay-Delta ecosystem while improving the reliability of the state's water supplies. The EWA Agencies completed an evaluation of the efficacy of the EWA during the first four years of implementation, as required by the ROD. The EWA Agencies signed an MOU on September 30, 2004, to extend the EWA Operating Principles and to continue implementing the EWA through December 31, 2007.

The State and Federal agencies that are signatories to the *Conservation Agreement Regarding the CALFED Bay-Delta Program Multi-Species Conservation Strategy* (Conservation Agreement) signed an amendment to extend the regulatory commitments and related process, as discussed in Section VII of the Conservation Agreement, through December 31 2007.

Progress toward milestones indicates that the CALFED Program is investing in actions that are expected to help recover at-risk species. Highlights from the assessment include:

- Nearly 80 percent of the 119 milestones provided for in CALFED's Stage 1 are on or ahead of schedule.
- More than 11,000 acres of wildlife friendly agriculture was protected in the Delta, meeting the Stage 1 target for the region.
- CALFED-funded cooperative projects are contributing to the restoration and protection of 7,000 acres of wetlands in San Pablo Bay and Suisun Marsh exceeding the Stage 1 target for tidal marsh restoration in San Pablo Bay.
- More than 50,000 acres of seasonal wetlands in the Sacramento River Region are being enhanced, protected or restored.
- About 500 acres of fresh emergent wetland in the San Joaquin River Region are being enhanced, protected or restored.
- Most of the environmental water quality milestones are being addressed by the 51 projects funded by the ERP; approximately 40 percent of those projects affect multiple regions.

The rest of this Accomplishments section provides a "snapshot in time" of the ERP activities during Year 5. Accomplishments include funded projects, completed projects and activities such as science workshops and public meetings (see also the Public Involvement section).

Most ERP actions span more than one year, and many projects are multi-phased, with each phase spanning several years. For example, Suisun Marsh Planning is a directed action and is on-going; actions such as these are listed in the program plan or annotated budget the year they were first selected for funding, and do not appear in the table below. ERP actions are divided into five categories for program tracking: Planning, Research, Implementation, Monitoring, and Oversight and Coordination. All ERP funded projects meet one or more of the ERP Strategic Goals. Because the following discussion focuses only on Year 5 activities, not all tasks or all goals may have projects associated with them.

Not all actions planned to begin in Year 5 happened as anticipated. Among the factors affecting ERP program planning are funding uncertainties because of budget shortfall and the unwieldy length of time it takes to get contracts approved, especially for season-sensitive activities.

Projects Funded during Year 5. During Year 5, the Authority gave the ERP approval to fund 7 projects, for a combined total of almost $15,156,898 in grants. Table 1 lists the projects, grant amount and recipient.

Complete copies of the project proposals are available at the ERP website http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemRestorationGrants.shtml

Table 1. ERP-Funded Projects during Year 5
Task: Implementation
Goal 1: At-Risk Species
Wilkins Slough Positive Barrier Fish Screen—Sediment Removal Project. This project adds sediment removal facilities to an existing fish screen at Reclamation District No. 108's Wilkins Slough irrigation water diversion on the Sacramento River's west bank, near Grimes. The project will install hydraulic nozzles that jet sediment away and prevent its build-up near the screen face. $495,000; to Reclamation District No. 108
Tisdale Positive Barrier Fish Screen Pumping Plants. This is a fish screen to minimize entrainment of fish at a large (960 cfs) irrigation water diversion on the Sacramento River's east bank, south of Meridian. This fish screen is recommended in the ERP's *Draft Stage 1 Implementation Plan*. $6,856,500; to Sutter Mutual Water Company.
Riparian brush rabbit and riparian woodrat recovery on the lower Stanislaus River. This project will restore riparian habitats along the lower Stanislaus and San Joaquin rivers adjacent to the Caswell State Park and the SJ river National Wildlife Refuge. $6,20,000; to USFWS and CDPR.

Goal 5: Non-Native Invasive Species
Expanded Prevention, Detection, and Control of Purple Loosestrife in the Bay-Delta Watershed. This project continues the California Department of Food and Agriculture's program to survey, control, and monitor purple loosestrife, a weed that is invading the Bay-Delta watershed. $328,136; to the California Department of Food and Agriculture.
Cosumnes River Preserve Perennial Pepperweed Control Project. This project is to control pepperweed, an invasive plant that is infesting riparian areas and wetlands in the Cosumnes River Preserve. The project will survey pepperweed infestations and test different pepperweed control practices. $418,995; to University of California, Davis.
Arundo Eradication and Coordination—Phase II. This is a three-year project to continue and expand efforts to control giant reed in 11 areas: the Lindo Channel near Chico; San Francisquito, Sonoma, Walnut, Putah, Cache, and Willow creeks; the Napa, lower American, and San Joaquin rivers; and the Gray Lodge Wildlife Area. $1,840,791 to the Sonoma Ecology Center.
Task: Monitoring
Goal 6: Water and Sediment Quality
Hamilton City Flood Damage Reduction and Ecosystem Restoration Project. This project is a joint effort between the US Army Corps of Engineers and the State of California Reclamation Board to increase flood protection and restore the ecosystem near Hamilton City, along the west bank of the Sacramento River by constructing a setback levee, removing most of the existing "J" levee, and actively restoring about 1,500 acres of native habitat. This funding is for the preconstruction engineering and design phase of the project. $ 1, 020,100; to Department of Water Resources
A Pilot Program for Monitoring, Stakeholder Involvement, and Risk Communication Relating to Mercury in Fish in the Bay-Delta Watershed. This project will monitor mercury in sport fish and other bioindicator organisms in the Bay-Delta system for three years. The project also includes consolidation of monitoring data, development of additional advisories and outreach and education activities, particularly for high-risk communities. This action is consistent with the Mercury Strategy for the Bay-Delta Ecosystem endorsed by the Authority. $4,513,819 to San Francisco Estuary Institute, with subcontracts to DFG (monitoring), California Department of Health Services (outreach and education), and Office of Environmental Health Hazard Assessment (advisories).

Projects Scheduled to be Completed during Year 5. Since it began more than eight years ago, the ERP facilitated funding for a variety of projects contributing to ecosystem restoration within its geographic scope. Because of the time-scale needed for ecosystem restoration, the ERP is just now approaching a time when it can begin to identify and articulate results from some of its funded projects. Table 2 lists the ERP projects schedule to be completed during Year 5.

Table 2. ERP Projects Scheduled to be Completed during Year 5.
Research, Outreach and Education on Fish Contamination in the Sacramento-San Joaquin Delta Watershed—Phase I Scoping (California Department of Health Services). Phase 1 included developing an agency/stakeholder advisory committee, collecting and analyzing existing information about fish contamination, conducting educational needs assessment in five priority counties, and developing a collaborative workplan for future phases of activities.

Selenium Effects on Health and Reproduction of White Sturgeon (*Acipenser transmontanus*) in the Sacramento-San Joaquin Estuary (UC Davis). This project is research on the toxic effects of selenium accumulation in white sturgeon and how elevated selenium concentrations in white sturgeons may affect the species' health and reproduction.

Assessment of Pesticide Effects on Fish and Their Food Resources in the Sacramento-San Joaquin Delta (UC Berkeley). Integrated lab and field study to provide information on pesticide toxicity to resident species develop the data needed to apply laboratory-derived toxicity measures to realistic field conditions, and putting results in an ecological context focusing on juvenile Chinook salmon and their prey.

Last Chance Creek Watershed Restoration Projects—Ferris Meadowview Reach (Feather River Coordinated Resources Management). This watershed contains the longest contiguous meadow complex in the Sierra Nevada drainage area of the Sacramento River. The Ferris Meadowview Reach project restored 9.1 miles of channel and 4,330 acres of meadow by returning streamflow to abandoned or reconstructed channels.

Feasibility Study of the Ecosystem and Water Quality Benefits Associated with Restoration of Franks Tract, Big Break and Lower Sherman Lake (DWR). Franks Tract restoration originally was considered an ERP commitment; however, initial studies and modeling suggested that proposed actions could have greater water quality benefits and warranted additional study. DWR completed the study in June 2005, called a "Pre-Feasibility Study," and plans to follow up with a Reconnaissance Study before a pilot or full-scale project is started. Franks Tract is now considered part of the Drinking Water Quality Program (DWQP) because one of the project's goals is to improve water project operations while reducing salinity levels in the South Delta and at the Contra Costa Water District intakes and at the water projects' export facilities.

Sources and Causes of Oxygen Demand from Algal Biomass in the San Joaquin River Deep Water Ship Channel [Directed Action] This project will determine the sources and causes of oxygen demand in the deep water ship channel downstream of Stockton during the summer and fall of 2001.

Battle Creek Conservation Easements Acquisitions, Management, and Restoration Planning. This project will fund the acquisition of conservation easements on three properties in the Battle Creek watershed for the benefit of Chinook salmon and steelhead restoration efforts.

Lassen National Forest Watershed Stewardship within the Anadromous Watersheds of Butte, Deer, and Mill Creeks (U.S. Forest Service). This was the second phase of restoration project in the three watersheds and included sediment reduction projects in Deer and Mill Creeks, meadow surveys and restoration demonstration projects, installing interpretive displays at seven recreation acres, campground education projects and established the Watershed Stewardship education programs at Chester elementary and high schools.

Adopt-A-Watershed Leadership Institute (Adopt-A Watershed). This project funded 30 new leadership teams to the Adopt-A-Watershed leadership institute. The institute provides teaches with support, structure and training for developing K-12 science curriculum to help students and communities to develop scientific literacy, environmental stewardship and a service ethic.

Educating Farmers and Landowners in Biological Resource Management (Community Alliance with Family Farmers). This continued the farmer to farmer outreach and education and technical assistance program which had resulted in reduced pesticide and fertilizer use. It also provided farmers and landowners with technical expertise regarding biological and watershed management practices to reduce agricultural inputs into waterways and with practical techniques for restoring habitat.

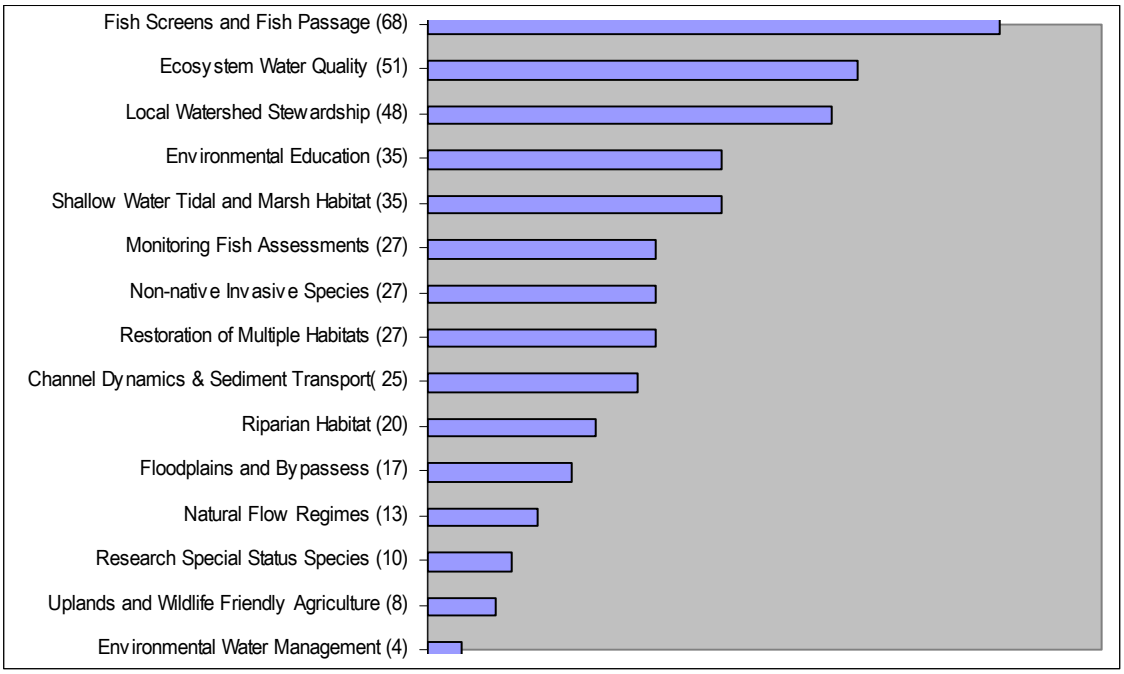
Food Resources for Zooplankton in the Sacramento-San Joaquin River Delta (UC Davis). This project assessed the quantity and quality of food resources for copepods in various habitats of the Sacrament-San Joaquin River Delta. The project also evaluated the species-and habitat-specific nutritional value of copepods for fish production.
Sacramento River Small Fish Screen Project Vertical River Pump Diversions (Natural Resources Conservation Service). This cooperative on-going project is to screen diversions on the Sacramento River, reduce entrainment and advance screen technology by demonstrating the highly useful retrievable feature in screen design.
Fish Passage Improvement Project at the Red bluff Diversion Dam—Balance of Phase II Funding (Tehama-Colusa Canal Authority). The objectives of this project are to produce the preliminary design of the project facilities and a NEPA/CEQA document.
Full-Scale Demonstration of Agricultural Drainage Water Recycling Process Using Membrane Technology (WaterTech Partners). This was a demonstration project to test whether sustained, full-scale operation of an on-farm, tile-water recycling process can eliminate off-farm drainage disposal. This was to build a prototype full-scale demonstration project for a technically, economically and environmentally viable process to achieve the selenium water quality objectives for the San Joaquin River watershed.
Geomorphic and Geologic Mapping for Restoration Planning, Sacramento-San Joaquin Delta Region (William Lettis & Associates, Inc.). This is a geologic and geomorphic mapping project that will produce GIS maps of the eastern Delta and lower Sacramento and San Joaquin Rivers. These maps integrate early historical record interpretation with established geomorphic and geologic mapping techniques to reconstruct pre-existing river system components as an aid to restoration and management of these areas.
Technical and Scientific Review of Upper Yuba River Studies Program (Dr. Gordon Grant).. Dr. Gordon Grant of the USFS will provide technical expertise to the CALFED Bay-Delta Program's Upper Yuba Rivers Studies Program.
Selected Fish Screens on Sacramento River and Tributaries. This project will provide funds to install two demonstration fish screens at water diversions located on the Sacramento River and to conduct outreach activities to encourage other private owners to participate in voluntary screening of their diversions to prevent entrainment of anadromous fish species.
Tuolumne River Setback Levees and Channel/Mining Reach Restoration (7/11 Segment) This project will fill mining pits, remove dredger tailings, construct setback levees, and restore the channel and floodplain in a 2.6 mile section of the Tuolumne River extensively mined for aggregate material.
Development of a Comprehensive Implementation Plan for a Statistically-Designed Marking/Tagging and Recovery Program for Central Valley-Produced Chinook Salmon and Steelhead. This project will develop a plan to implement a Constant Fractional Marking (CFM) program that integrates traditional coded-wire tagging/fin marking (CWT) and otolith thermal marking (OTM) to address central Chinook salmon and steelhead management questions regarding the relative contribution of hatchery and natural production to adult populations as represented by fisheries and to develop a means to implement selective fisheries.

The 30-year plan for ecosystem restoration has guided the 400-plus ERP projects directly designed to address ecosystem restoration. Given the time-scale of ecosystem restoration projects, many of the funded projects need to take place in phases; many ERP projects are at a point of needing next phase review and possible funding while others are in various stages of completion or just starting. Since ecosystem restoration has a 30-year or more implementation schedule, the information below provides insight into the areas in which ERP actions are taking place. Definitions of the project types may be found in the ERP *Draft Stage 1 Implementation Plan*.

Listed below is a breakdown of the 415 ERP funded projects by ERP goal as of December 2004. Because many ERP projects address more than one of the Strategic Goals, the following project numbers and percentages total more than 100 percent and more than 415 projects. Percentages in the table refer to the percent of total ERP-funded projects as of December 2004.

Goal 1: At-Risk Species
708 Projects, 41%, address recovering endangered and other at-risk species and native biotic communities.
Goal 2: Ecological Processes
296 Projects, 17%, address rehabilitating ecological processes.
Goal 3: Harvestable Species
183 Projects, 10%, address maintaining or enhancing harvestable species populations.
Goal 4: Habitat Restoration
297 Projects, 17%, address protecting and restoring habitats.
Goal 5: Non-native Invasive Species
91 Projects, 5%, address preventing establishment of or reducing impacts from non-native invasive species.
Goal 6: Environmental Water and Sediment Quality
170 Projects, 10%, address improving or maintaining water and sediment quality.

Types and Number of Restoration Projects Funded by the ERP Through 2004



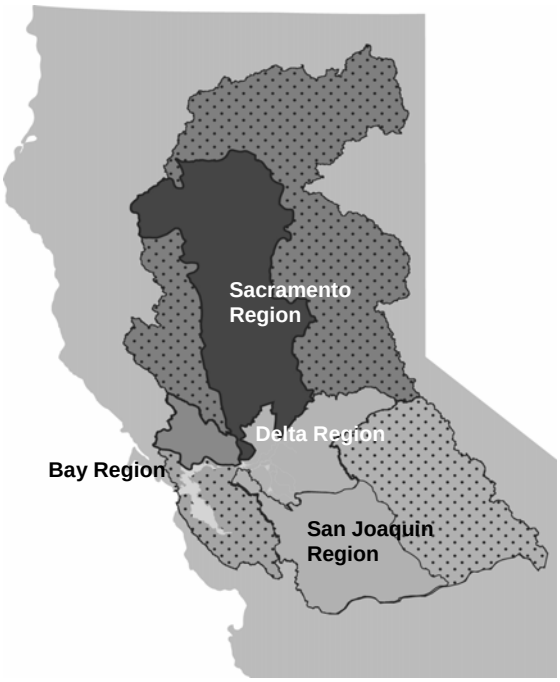
Fund Sources and Amount of Funding to Support ERP Projects Through 2004

Fund Source	Percent of Total ERP Funding	Fund Source	Percent of Total ERP Funding
Prop. 204, Chapter 4	1%	General Fund	1%
Prop. 50, Chapter 7	39%	Restoration Fund (Federal)	8%
Local Cost Share for PSP Projects	11%	Water and Related Funds (Federal)	1%
Prop. 13. Environmental Water Quality	6%	Prop. 204, Chapter 7	28%
DWR State Water Projects[1]	4%	Other Federal Funding	1%

[1] Total Amount: $172,920,000. (Amount includes $7,268,000 from State Water Projects for mitigation and $20,000,000 in local cost-share which are not counted toward the $150 million commitment toward the Ecosystem Restoration Program.)

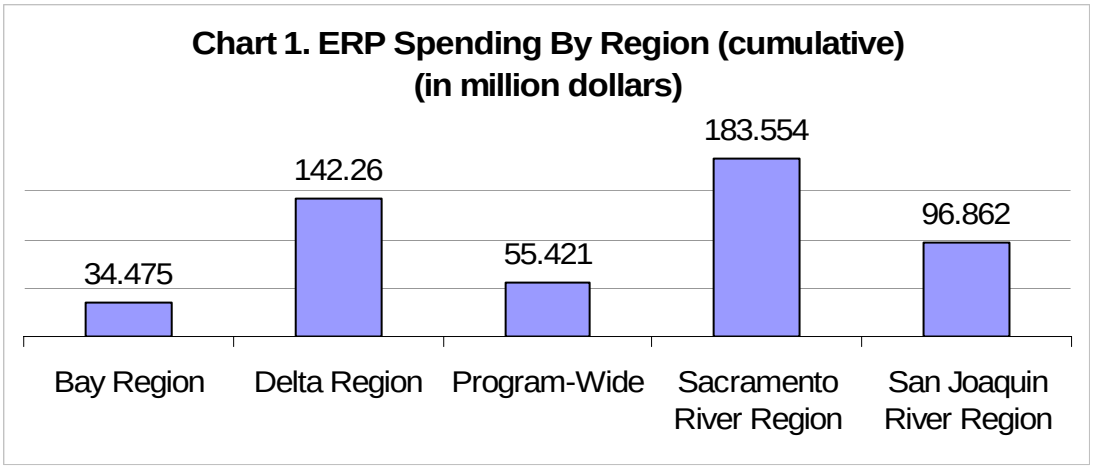
Geographical Distribution of Activities

Among the ways in which ERP categorizes its activities is by ERP Region, or geographical distribution of its activities. The ERP geographic scope differs slightly from the overall Bay-Delta Program regions because the focus of the ERP is on the Bay-Delta and its watersheds. The ERP geographic scope fits within four of the five CALFED regions.

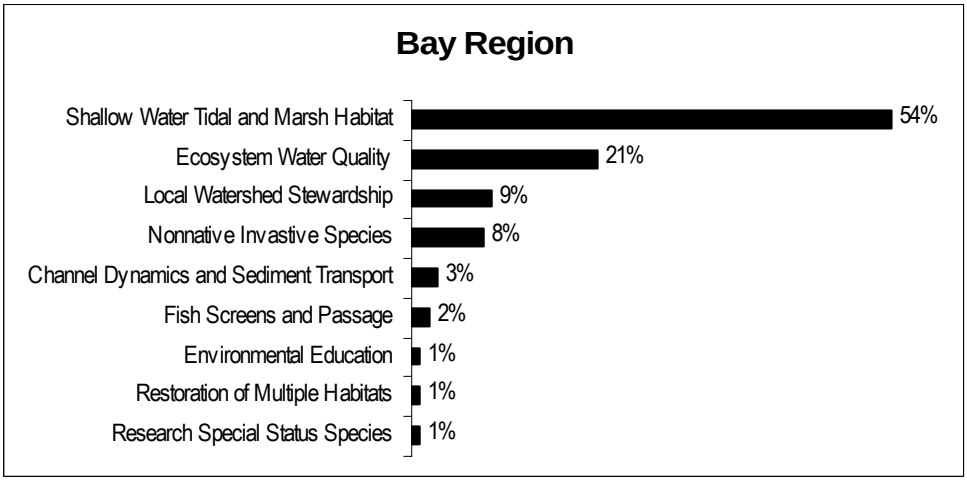


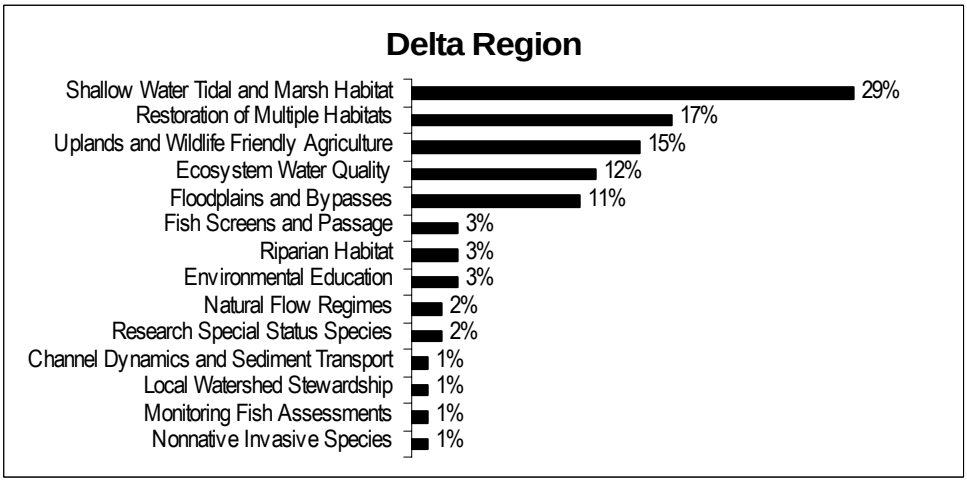
The figure shows the ERP geographic scope; the solid areas represent the area where most of the ecosystem restoration activities have taken place, as guided by the Ecosystem Restoration Program Plan (ERPP) and other guiding documents. For more information please see the ERPP Strategic Plan.

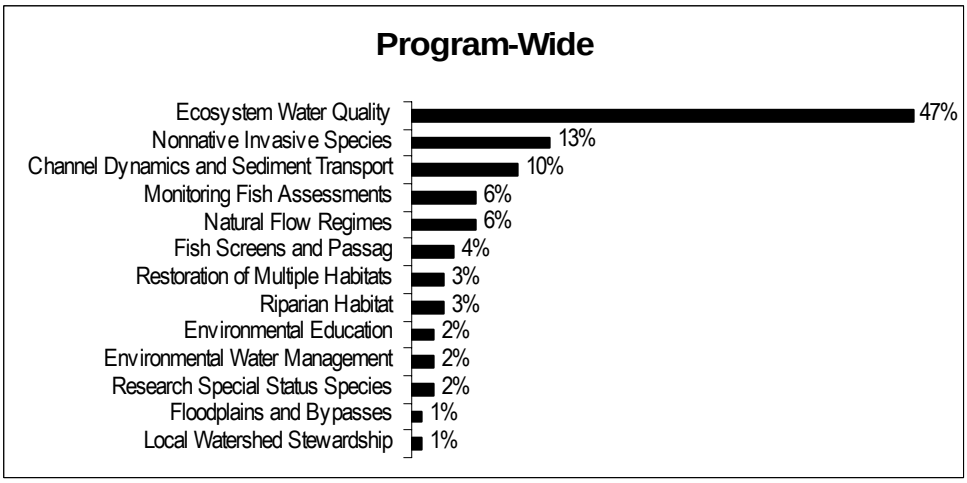
The tables below show ERP funding by ERP Region and by ERP topic areas. Topic areas provide a better depiction of the variety of ERP projects than organizing by goals would achieve. In terms of percent of total money allocated since the beginning of the program ($512,572,673), two-thirds of the funds are allocated to projects in the Sacramento and Delta regions, while the remaining two regions and the Multi-Region, Landscape and Program-wide category make up the final third. Chart 1 shows the percentages of project dollars spent in each region.

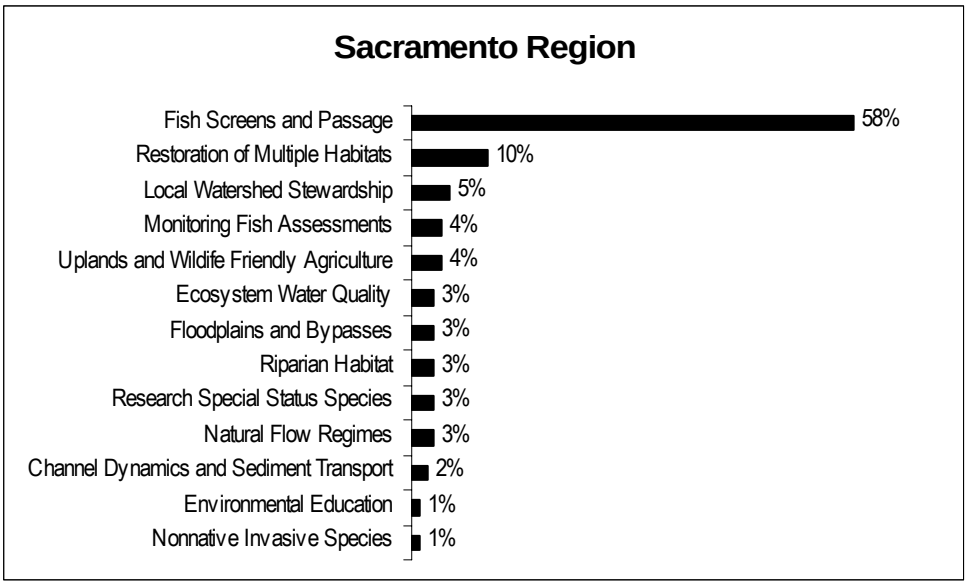


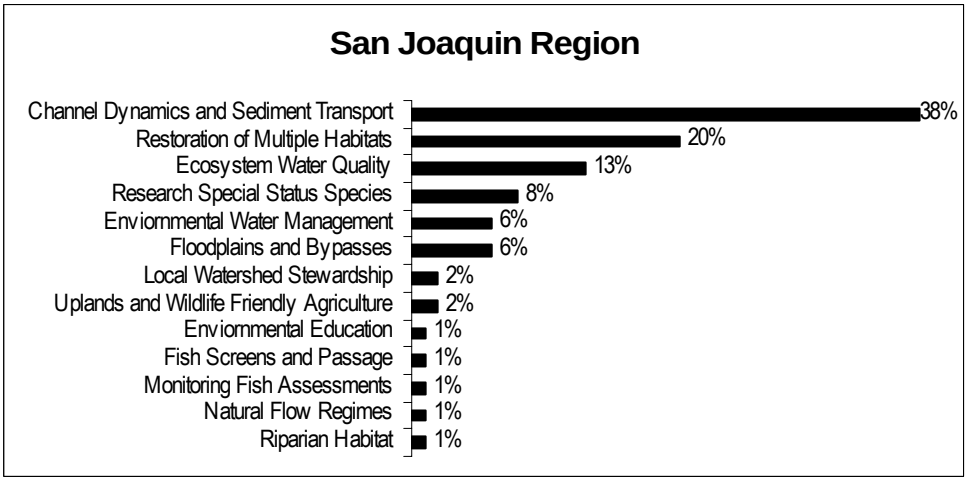
Regional Investments
Percent of total dollars invested for ERP actions in respective regions








Sacramento Region
Fish Screens and Passage 58%
Restoration of Multiple Habitats 10%
Local Watershed Stewardship 5%
Monitoring Fish Assessments 4%
Uplands and Wildife Friendly Agriculture 4%
Ecosystem Water Quality 3%
Floodplains and Bypasses 3%
Riparian Habitat 3%
Research Special Status Species 3%
Natural Flow Regimes 3%
Channel Dynamics and Sediment Transport 2%
Environmental Education 1%
Nonnative Invasive Species 1%


San Joaquin Region
Channel Dynamics and Sediment Transport 38%
Restoration of Multiple Habitats 20%
Ecosystem Water Quality 13%
Research Special Status Species 8%
Enviornmental Water Management 6%
Floodplains and Bypasses 6%
Local Watershed Stewardship 2%
Uplands and Wildlife Friendly Agriculture 2%
Enviornmental Education 1%
Fish Screens and Passage 1%
Monitoring Fish Assessments 1%
Natural Flow Regimes 1%
Riparian Habitat 1%

Major Activities

The major activities listed in Tables 3 and 4 below were developed by the ERP implementing agencies in coordination with the CBDA ERP staff to describe the actions the ERP implementing agencies believe are the highest priority to maintain the regulatory commitments provided by the Conservation Agreement through Stage 1 (December 2007) of implementation of the CALFED ROD. Therefore, the priorities described in this Program Plan are focused on specific actions in Year 6 and Year 7 only. Table 3 describes the specific actions proposed for Year 6. Table 4 includes specific actions for Year 7, as well as some additional priority projects that may be implemented in Years 8 and 9. However, the activities for Years 8 and 9 are not inclusive of all the potential actions that will need to be considered in those years.

The ERP implementing agencies and CBDA ERP staff relied on the ERP Strategic Plan, the ERP Draft Stage 1 Implementation Plan, and the ERP Milestones Assessment to develop the list of priority actions for Years 6 and 7. These actions are also organized to reflect the guidance provided by the ERP Strategic Plan and in response to the more recent Delta pelagic organism decline. The outline of this organizational structure for Tables 3 and 4 is shown below.

> *At-Risk Delta Dependent Fish Species*
- Native Anadromous Fish
- Non-Native Invasive Species
- Delta Pelagic Fishes

> *Multiple Species*

> *Mandated Programs*
- Central Valley Project Improvement Act contribution
- Assistance to Farmers Integrating Agricultural Activities with Ecosystem Restoration
- Mine Remediation and San Joaquin River Dissolved Oxygen Projects

> *Staff*

In the CALFED ROD and the Conservation Agreement, the ERP implementing agencies anticipated an annual expenditure of $150 million for ERP actions during Stage 1. This level of annual funding was developed to provide the resources necessary to achieve progress toward implementing the milestones and maintain the CALFED Program environmental compliance as described in the ROD. The funding available and anticipated during Years 6 and 7 is not sufficient to support all of the ERP priority actions required through the end of Stage 1.

The ERP Multi-Year Plan was initially made available in March 2005 for review and public comment. However, when all of the Multi-Year Program Plans were prepared for the April BDPAC and Authority meetings, the ERP implementing agencies determined that additional work and review was needed before making a revised version of the ERP Multi-Year Plan available for review. The need for this additional work was driven by the ERP implementing agencies' intent to prioritize Year 6 activities to address the issues surrounding the decline of Delta pelagic fishes.

A revised ERP Multi-Year Plan was presented to the BDPAC Ecosystem Restoration subcommittee at their May and June meetings, with a focus on the highest priority ERP actions to be implemented in Years 6 and 7. The final list of these actions described in Tables 3 and 4 are based on feedback from these public forums.

The CBDA ERP staff worked closely with the ERP implementing agencies to produce this final version of the ERP Multi-Year Plan, and agree with the need to organize and prioritize the Years 6 and 7 activities to respond to the decline in Delta pelagic fishes.

The CBDA ERP staff and the ERP implementing agencies also believe it is important to acknowledge the shift in the approach to implementing the Multi-Year Program Plan. In previous years, the ERP has solicited for proposals to address the highest priorities based on criteria in the ERP Strategic Plan and the ERP Draft Stage 1 Implementation Plan. With the exception of the focused solicitation proposed in Year 6 to assist farmers with integrating agricultural activities into ecosystem restoration, the ERP implementing agencies do not currently plan to solicit for proposals to meet ERP high priorities in Year 6 or in Year 7.

However, the CBDA ERP staff expects that DFG and the other ERP implementing agencies will continue to require each specific action to be described in a proposal format, and that each proposal will be independently reviewed. This independent review will be coordinated by the CBDA ERP staff, and will provide feedback to the ERP implementing agencies to ensure that ERP actions are prioritized, selected, designed, and implemented consistent with the guidance provided by the ERP Strategic Plan, such as the selection criteria that address ecological benefit, information value, and public support and implementability (described in greater detail in the ERP Strategic Plan, pp. 47-51).

Protecting at-risk species is central to implementation of the ERP, and the ERP implementing agencies estimate that approximately 75% of the estimated funding in Years 6 and 7 is targeted for this purpose. In particular, the decline of the delta pelagic organisms – including the delta smelt – was a primary factor as the ERP implementing agencies and CBDA ERP staff developed the ERP actions to be implemented in Years 6 and 7.

As an example, the ERP implementing agencies and CBDA ERP staff have identified $1.5 million in ERP funding in Year 6 to implement focused research projects developed by the ongoing IEP pelagic organism decline project work team. Also, the ERP implementing agencies and CBDA ERP staff have directed the Delta Regional Ecosystem Restoration Implementation Plan to focus its short-term work products on actions that would assist in the recovery of the delta pelagic fish and listed salmonids. Additional details are provided below.

Finally, the Year 6 funds have also been identified to consider the proposals highly ranked in the Science Program PSP, but still seeking future fund sources, that also are relevant to the ERP goals and objectives. Under the Multiple Species heading in Table 3, see “Additional Milestones Projects for Other At-Risk Species Affected by Water Projects Operations, Based on Annual Milestones Assessments.”

Delta Regional Ecosystem Restoration Implementation Plan (DRERIP). The DRERIP, a component of the Delta Improvements Package, is the first of several regional plans intended to refine the existing planning foundation guiding the long-term implementation of the CALFED Ecosystem Restoration Program element. The DRERIP will update the ERP's planning foundation specific to the Delta, refine existing Delta-specific restoration actions and guidance for Delta-specific ERP tracking, performance evaluation, and adaptive management feedback. DFG, USFWS, and NOAA Fisheries, in collaboration with other CALFED agencies, local interests, stakeholders and academics, will continue to develop this regional restoration plan for the Delta, with an overall targeted completion date of May 2007.

DRERIP will evaluate previously planned targets, actions and milestones in light of the current state of knowledge and restoration projects implemented to date. Current knowledge of species life histories and how the system works (ecosystem processes, habitats and stressors) will be captured in conceptual models, which serve as the tools for evaluating actions. The DRERIP Adaptive Management Planning Team (AMPT), which is coordinating DRERIP science input, has completed the processes and framework necessary to develop the conceptual models and conduct the scientific evaluation of actions. Under the original schedule, we would now embark on developing all models prior to evaluation, feasibility assessment and prioritization.

Short-term DRERIP Work Products Focused on the Pelagic Organism Decline

Recognizing the current management attention on the recent marked declines in numerous pelagic fishes (some of which are MSCS "R" species) and zooplankton in the upper San Francisco estuary (Delta and Suisun Bay), in year 6 the DRERIP effort will focus on assembling and evaluating current scientific knowledge underlying proposed ERP actions that target the recovery of these estuarine species. Our goal is to quickly produce tools to assist with these urgent management needs, including conceptual models of the species and the ecosystem components on which they depend and a list of scientifically evaluated Delta ERP restoration and research actions. The Interagency Ecological Program (IEP) has initiated a 2005 work program (known as the Pelagic Organism Decline (POD)) to investigate the causes of these pelagic species declines using data analysis and strategic data collection. The ERP proposes to build on these POD efforts in a unified approach to address the Delta pelagic fish decline.

This strategic DRERIP effort will:

- Complete life history conceptual models for the MSCS "R" fish species and striped bass (delta smelt, longfin smelt, and green sturgeon models are completed; salmon, steelhead, Sacramento splittail and striped bass models are to be completed).
- Develop relevant ecosystem conceptual models.
- Identify proposed ERP actions that are directly relevant to MSCS "R" fish and striped bass.
- Identify cross-cutting issues between proposed ERP and non-ERP actions that are directly relevant to Delta management;
- Scientifically evaluate ERP actions using the peer-reviewed conceptual models;
- Provide ERPIAMs with a list of restoration actions with likely population level benefits and research needed to reduce scientific uncertainties to further ERP goals for these species.

Coordination with IEP and CBDA the Science Program

IEP POD. The ERP proposes to coordinate the DRERIP effort directly with the IEP POD evaluation of the recent marked decline of Delta pelagic fish and prey resources. The focused year 6 DRERIP efforts will add value to the POD effort by providing the pertinent species life history and ecosystem conceptual models, and by evaluating currently proposed actions to provide managers with a list of full- and pilot-scale scientifically-based implementation actions determined to have likely population level benefits to pelagic species and other "R" Delta fish. The DRERIP component will provide additional insight into research needed for reducing uncertainties for these species.

Performance Measures. ERP agency staff will coordinate with Science Program staff to identify appropriate mechanistic indicators based on the life history and ecosystem conceptual models developed under DRERIP. These model-based Level 3 performance measures can be compared to current monitoring efforts to identify new high priority monitoring components (gaps) and to refine ongoing monitoring efforts.

Cross Program Relationships

The focused year 6 DRERIP effort will look at potential ecological outcomes of proposed Delta water management actions and identify cross-cutting issues directly relevant to Delta management.

Table 3. Major Activities and Projects for Year 6

(This table serves as the Year 6 Annotated Budget for Implementing the Single Blueprint)

At-Risk Delta Dependent Fish Species

Native Anadromous Fish

Battle Creek Habitat Restoration Project

The Battle Creek Salmon and Steelhead Restoration Project would restore approximately 42 miles of historical anadromous fish habitat in Battle Creek, and an additional 6 miles of habitat in its tributaries. Components of the project include:

- Removal of 5 diversion dams that would have marginal power production value after their releases are adjusted to meet streamflow needs below the dams,
- Installing fish ladders at 3 diversion dams and screening their associated diversions,
- Increasing flow releases from all remaining diversion dams affecting anadromous fish on Battle Creek,
- Direct connection of powerhouse tailraces to power canals to eliminate redundant screening requirements, flow fluctuations associated with powerhouse operations, and false attraction of returning fish to powerhouse tailraces containing a mixture of waters from different basins.

Due to delays and increased costs, the Restoration Project is seeking additional funding. Thus, it is currently undergoing technical review through the Ecosystem Restoration Program. It is expected that a funding decision will be made in 2005.

Estimated Cost: $64,000,000
Funding Source: Prop 50 (CBDA), Prop 50 (DFG), Unknown
Participating Agencies: USBR, USFWS
Milestone(s): 57, 62, 64, 66, 67, 69
Task Category: Implementation

Coleman Barrier Weir and Fish Ladder Modifications

The proposed modifications of the existing Coleman National Fish Hatchery barrier weir and fish ladders are designed to provide improved fish passage management capability at this site. The proposed modifications of the structure will remedy these deficiencies and provide improved fish passage management capability consistent with objectives in the Battle Creek Restoration Project.

Estimated Cost: $6,500,000
Funding Source: Bay-Delta Act reappropriated
Participating Agencies: USBR, USFWS
Milestone(s): 69, 72
Task Category: Implementation

Butte Creek Spring-Run Chinook Salmon Life History Investigation (2004 Monitoring PSP)

The project continues to monitor spring-run Chinook salmon and steelhead trout populations in Butte and Big Chico creeks to evaluate the effectiveness of many anadromous fish restoration projects in the two watersheds and to develop better information on these species' life histories.

Estimated Cost: $513,281
Funding Source: Prop 50 (DFG)
Participating Agencies: CSU Chico, DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research - Reconsider if Revised (Implementation Year 6)

Clear Creek Restoration

Clear Creek restoration continues to implement Chinook salmon and steelhead habitat enhancement projects through partnerships with local landowners, public and private agencies, and universities. Restoration activities focus on channel restoration, adding spawning gravel, and erosion control.

Estimated Cost: $3,800,000
Funding Source: Prop 204, Ch 7, Prop 50 (DFG)
Participating Agencies: DFG, USFWS
Milestone(s): 54, 58, 62, 64
Task Category: Implementation

Clear Creek - Headcut Only

Modifications to the channel bed to reverse head cutting issues will be completed to secure the benefits previously obtained through previously completed Clear Creek restoration activities targeting Chinook salmon and steelhead.

Estimated Cost: $1,500,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, USFWS
Milestone(s): 54, 58, 62, 64
Task Category: Implementation

Clear Creek anadromous salmonid monitoring program (2004 Monitoring PSP)

This project is a comprehensive salmonid monitoring program that will evaluate restoration actions and inform adaptive management of Clear Creek.

Estimated Cost: $3,373,313
Funding Source: Prop 50 (DFG)
Participating Agencies: USFWS
Milestone(s): 112, 119
Task Category: Monitoring and Research - Reconsider if Revised (Implementation Year 6)

Lower Clear Creek monitoring program (2004 Monitoring PSP)

The project monitors how the Lower Clear Creek Floodway Restoration Project is affecting the creek's geomorphology and streamside habitats, including riparian birds.

Estimated Cost: $1,308,449
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, Western Shasta Resource Conservation District
Milestone(s): 112, 119
Task Category: Monitoring and Research (Implementation Year 6)

Status and Trends/Baseline (Salmonids)

NOAA Fisheries and USFWS reinitiation efforts concerning the efficacy of the EWA and progress toward achieving milestones for the CALFED Bay-Delta Program (September 2004) recommended the CALFED program develop a Central Valley-wide comprehensive status and trends/baseline monitoring program, in coordination with existing monitoring programs, for all salmonids. A comprehensive monitoring program is needed to insure coordinated monitoring efforts, maximize monitoring opportunities, and avoid duplication of effort. Baseline and status and trends monitoring is necessary to measure, assess, and document the effects of CALFED restoration actions contributing toward the recovery of listed species and in achieving the milestones. This program would provide the oversight and guidance necessary to coordinate comprehensive monitoring efforts in the Central Valley for salmonids, including plans and pilot projects that would contribute to this effort, such as DFG's Adult Chinook Salmon Escapement Monitoring Plan and the Central Valley Steelhead Comprehensive Monitoring Plan. NOAA Fisheries reinitiation also identified a need for scientifically sound performance measures to describe and evaluate the benefits of the CALFED program on listed salmonids. This work element would contribute significantly to developing relevant performance measures. This is a long-term project covering years 7, 8, and 9 that will require monitoring, planning and adaptive management.

Estimated Cost: $2,750,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Planning

San Joaquin Basin Monitoring

Monitor status and trends of salmonids in Stanislaus, Tuolumne and Merced rivers.

Estimated Cost: $2,250,000
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s):
Task Category: Monitoring and Research

Constant fractional marking

Implementation of a Constant Fractional Marking Program for fall-run Chinook salmon at Central Valley hatcheries. CFM plan developed by the IEP Central Valley Salmonid Project Work Team. Equipment purchase could be accomplished through a Purchase option. A Lease/Purchase option could be considered. It would increase equipment costs by about $500,000 but spread costs over three years. Year 6 funding consists of $25,000 for planning, $4,000,000 for equipment purchases, and $818,000 for initial implementation. Beyond Year 6 costs are solely implementation.

Estimated Cost: $4,835,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Implementation

Development of a Comprehensive Central Valley Adult Chinook Salmon Escapement Monitoring Plan

The Central Valley Chinook Salmon Escapement Monitoring Plan will be a long-term comprehensive plan designed to estimate population status and trends in abundance of adult Central Valley salmon in a statistically valid manner. Development of the plan will include review of existing monitoring programs, and development of revised programs including escapement estimation, coded-wire tag recovery, and aging programs, and a coordinated data management and reporting system.

Estimated Cost: $375,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, NOAA Fisheries, Pacific States Marine Fisheries Commission, USFWS
Milestone(s): 112, 119
Task Category: Monitoring and Research - Directed Action

Upper Sacramento River Basin Chinook Salmon Escapement Monitoring Program (2004 Monitoring PSP)

This proposal will continue monitoring of the annual abundance, migration timing, and distribution of adult winter, spring, late-fall Chinook salmon returning to spawn in the Upper Sacramento River basin for the next three years. Streams and species/runs to be monitored include: Sacramento River - winter, fall, and late fall-run Chinook; Clear Creek - fall-run Chinook; Battle Creek - fall-run Chinook; Mill Creek - fall and spring-run Chinook; Deer Creek - fall and spring-run Chinook; Beegum Creek - spring-run Chinook; Antelope Creek - spring-run Chinook.

Estimated Cost: $1,353,357
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, Pacific States Marine Fisheries Commission
Milestone(s): 112, 119
Task Category: Monitoring and Research - Directed Action

Development of a Central Valley Steelhead Comprehensive Monitoring Plan

The Central Valley Steelhead Monitoring Plan will be a comprehensive plan for steelhead population monitoring that, when implemented, will provide the data necessary to assess whether or not restoration and recovery goals are being achieved, and to improve management of the species.

Estimated Cost: $350,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, NOAA Fisheries, Pacific States Marine Fisheries Commission, USFWS
Milestone(s): 112, 119
Task Category: Monitoring and Research - Directed Action

Sacramento River Juvenile Winter Chinook Salmon Abundance Estimates with Comparisons to Adult Escapement (2004 Monitoring PSP)

The project will monitor juvenile winter-run Chinook passing the Red Bluff Diversion Dam to obtain juvenile winter-run Chinook production indices and to correlate these indices with estimated escapement of these fish.

Estimated Cost: $2,282,630
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, USFWS
Milestone(s): 112, 119
Task Category: Monitoring and Research - Directed Action

Juvenile Outmigrant Sampling

Juvenile outmigrant sampling needs include additional monitoring on the mainstem Sacramento River, discussed in meetings of the IEP Upper Sacramento River Monitoring and Juvenile Monitoring Project Work Teams. Monitoring will improve understanding of winter and spring-run Chinook migration through the Sacramento River prior to entering the Delta.

Estimated Cost: $300,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research

Juvenile Anadromous Salmonid Emigration Monitoring on the Sacramento River at the Glenn-Colusa Irrigation District (GCID) Fish Screen Bypass Channel (2004 Monitoring PSP)

This project will continue an existing California Department of Fish and Game juvenile salmonid monitoring project located at the Glenn Colusa Irrigation District (GCID) diversion on the Sacramento River near Hamilton.

Estimated Cost: $90,072
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research - Directed Action

Real Time Flow Monitoring in the Sacramento River System

Continue operation and maintenance of stations that monitor stream flows and water quality in four eastside Sacramento River tributaries where the CVPIA has purchased water to maintain instream flows for salmonids: Big Chico, Butte, Deer, and Mill creeks.

Estimated Cost: $110,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, DWR
Milestone(s): 66, 115
Task Category: Monitoring and Research - Directed Action

San Joaquin Basin-wide temperature model

DFG will collect, store and manage water temperature and meteorological data in support of Tri-Dam Project's original approved ERP grant to develop a Water Temperature Model on the Stanislaus River; included in this task is expanded sampling on the Tuolumne and Merced rivers to develop a Basin-Wide Water Temperature Model. Year 7 total includes $603,988 contract with Tri-Dam.

Estimated Cost: $244,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 84
Task Category: Implementation

Tuolumne River restoration monitoring (2004 Monitoring PSP)

This project will monitor the effects on geomorphology, salmonids, and streamside habitats of four Tuolumne River restoration activities: gravel mining restoration, Special Run Pool 9 restoration, fine sediment management, and coarse sediment management.

Estimated Cost: $2,430,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, Turlock Irrigation District
Milestone(s): 112, 119
Task Category: Monitoring and Research (Implementation Year 6)

EWP (Environmental Water Program)

The EWP is a ROD commitment to improve salmon spawning and juvenile survival in upstream tributaries to the Bay-Delta watershed by purchasing up to 100 TAF annually by the end of Stage 1. The USFWS is leading the EWP efforts to acquire this water.

Estimated Cost: $632,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, NOAA Fisheries, USFWS
Milestone(s): 57, 66, 96
Task Category: Implementation

RD108 Fish Screen

This project represents completion of the five-phase project to design and construct a state-of-the-art fish screen at Reclamation District 108's Wilkins Sough diversion facility on the Yuba River to reduce entrainment of anadromous fish.

Estimated Cost: $7,400,000
Funding Source: Prop 50 (DFG)
Participating Agencies: RD108
Milestone(s): 67, 72
Task Category: Implementation

Rim Dam fish passage evaluation (NOAA Fisheries)

Evaluate salmonid passage feasibility above the rim dams of the Central Valley.

Estimated Cost: $1,000,000
Funding Source: Unknown
Participating Agencies: NOAA Fisheries
Milestone(s): 67, 72
Task Category: Planning

Non-Native Invasive Species

Lake Davis Pike Containment Project

CDWR, under the direction of the CDFG, will plan, design, and implement either a modification of the existing containment facility or construction of a new containment structure downstream of the outlet for Lake Davis. This project will need to proceed regardless of the status of the program to eliminate pike from Lake Davis and is not part of that program or the ERI/EIS that will be prepared for that program. The improved containment structure is a critical component to help minimize the potential for pike to move downstream from the reservoir prior to successful pike eradication. Currently, the outlet for Lake Davis has a grating system which is designed to kill fish passing through the outlet. While this system appears to have successfully prevented any species of fish greater than 4 inches in length from passing through the outlet and surviving, the number of pike within the reservoir is increasing over time and CDFG personnel have been finding more pike and smaller pike closer to the dam as the population increases in the lake. Therefore, the efficiency of the device currently in place to help keep pike from moving downstream from the reservoir needs to be improved.

Estimated Cost: $2,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DWR
Milestone(s): 30
Task Category: Implementation

Lake Davis Pike Eradication Planning and Implementation

DFG will analyze alternatives through the CEQA/NEPA process and develop an implementation plan for ridding northern pike from Lake Davis. DFG, in collaboration with stakeholders and other agencies, will conduct planning during Years 6 through 7 which will consist of developing alternatives, conducting an initial study, filing a Notice of Preparation, scoping, and EIR/EIS development.

Implementation starts in Year 8 following obtaining the required permits. Post project monitoring will occur to assess the success of the eradication efforts.

Estimated Cost: $3,200,000
Funding Source: General Fund, Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 22
Task Category: Planning

Zebra Mussel Rapid Response

This project will build on established partnerships and leverage federal monies that were used to establish a rapid response plan for zebra mussels in California. The new action items would be to enhance the current plan and develop a working group that would implement the plan and begin working on addressing commitments and responses to the introduction of zebra mussels into California waterways. The actions would be involvement of NISAC as short term Ad Hoc committee and the team would evolve to address other NIS issues as the team builds capacity. These funds would be competed.

Estimated Cost: $50,000
Funding Source: Prop 50 (DFG)
Participating Agencies: Unknown
Milestone(s): 22
Task Category: Implementation

Zebra Mussel Prevention

This project will build on established partnerships and leverage federal monies used to address the prevention of zebra mussels entering into California waterways. The new action items will build on USFWS projects that targeted pathways for zebra mussels by surveying tailored boats and enhance traveler awareness by expanding these surveys as well as implementing Traveler Information Systems (TIS) in California. This two prong approach will assist with targeting areas where the California TIS system will need to be placed as well as integrating with the current TIS that the 100th Meridian Group (FWS) has in the Western United States. These funds would be competed (grants.gov)

Estimated Cost: $67,000
Funding Source: Prop 50 (DFG)
Participating Agencies: Unknown
Milestone(s): 22
Task Category: Implementation

Delta Pelagic Fishes

Blacklock Tidal Marsh Habitat Restoration Project

Restore tidal action to a 70 acre parcel of Blacklock Ranch in Suisun Marsh. Restore the Blacklock property to self-sustaining functioning brackish tidal marsh by restoring tidal action, reversing subsidence, and promoting establishment of native vegetation and a tidal marsh channel network appropriate to this location within the San Francisco Estuary. This project will contribute to CALFED's ERPP goal of restoring 5,000-7000 acres of tidal wetlands in Suisun Marsh.

Estimated Cost: $100,000
Funding Source: Unknown
Participating Agencies: DFG, DWR, USFWS
Milestone(s): 39, 40, 41, 42
Task Category: Implementation

Suisun Marsh Property Acquisition and Habitat Restoration

Acquisition of lands in the Suisun Marsh suitable for tidal restoration. Approved through the 2002 Project Solicitation Process.

Estimated Cost: $1,046,400
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 38, 39, 42
Task Category: Implementation

Pelagic Fish Species Scientific Investigations

Conduct preliminary investigations to identify high priority research needs to address the decline in pelagic organisms in the Delta. Implement selected research projects developed by the IEP Pelagic Organisms Decline (POD) effort.

Estimated Cost: $1,500,000
Funding Source: Unknown
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research

Monitoring Responses of the Delta Smelt Populations to Multiple Restoration Actions in the San Francisco Estuary (2004 Monitoring PSP)

This project will monitor delta smelt to discern how environmental conditions, including access to restored habitats, affect survival and population abundance.

Estimated Cost: $1,482,480
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, UC Davis
Milestone(s): 112, 119
Task Category: Monitoring and Research - Reconsider if Revised (Implementation Year 6)

Delta Regional Ecosystem Restoration Implementation Plan (DRERIP)

The DRERIP is the first of four regional plans envisioned in the ERP Strategic Plan, and will refine the ERP planning foundation specific to the Delta region. Funding is for federal implementing agency and consultant support

Estimated Cost: $300,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s): 1 - 37
Task Category: Planning - DFG Implementation and Program Support

Hamilton Airfield/Bel Marin Keys (BMK) Wetland Restoration

Restore San Pablo Bay tidal creeks and marshes by implementing the Hamilton Air Force Base - Bel Marin Keys wetlands restoration plan. MSCS fish and wildlife will benefit from these habitats.

Estimated Cost: $13,000,000
Funding Source: Federal
Participating Agencies: State Coastal Commission, USACE
Milestone(s): 39, 41, 42
Task Category: Implementation

Napa Salt Ponds Monitoring

This project would monitor the 10,000 acre Napa Salt Marsh Restoration projects effects on fish, wildlife and the Napa River estuary.

Estimated Cost: $666,666
Funding Source: Unknown
Participating Agencies: DFG, USACE
Milestone(s): 39, 40, 41, 42
Task Category: Monitoring and Research

Multiple Species

Additional Milestones Projects for Other At-Risk Species Affected by Water Projects Operations, Based on Annual Milestones Assessments

In the consultation letters sent in September 200, the USFWS and NOAA Fisheries noted that work on specific milestones needed to continue or be started. Funds expended to meet the requirements listed in the consultation letters may include fish passage or water acquisition projects. Milestones are a list of ERP, Multi-Species Conservation Strategy (MSCS), and Water Quality Program actions the CALFED Program will implement in Stage 1 to address covered species. The MSCS-ERP Milestones represent the ERP Agencies' objectives for ERP implementation that would allow covered species to make significant progress toward restoration and recovery. As stated in the ROD, the ERP Agencies will revise the milestone as necessary. During year 6, a long-term program of milestone assessment will be developed to ensure that the ERP and MSCS are implemented in a manner and to an extent sufficient to sustain programmatic FESA, CESA, and NCPPA compliance for all Program elements. Projects that could be considered under this item include Science Program PSP recommendations for projects seeking future funds relevant to ERP goals and objectives like the "Determination of Age Structure of Central Valley Salmon" analysis and the BREACH III effort.

Estimated Cost: $5,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s): 1, 2, 3, 17, 18, 21, 23, 24, 25, 33, 34, 36, 37, 44, 49, 50, 52, 53, 55, 57, 66, 67, 68, 69, 70, 71, 72, 74, 75, 78, 80, 81, 82, 83, 112, 119
Task Category: Implementation

Invasive Spartina control monitoring in the San Francisco Estuary (2004 Monitoring Proposal)
Invasive Spartina control monitoring in the San Francisco Estuary. The project will monitor tidal marshes treated to control Atlantic cordgrass and its hybrids to determine if treatment was effective. Annual regional surveys for nonnative cordgrasses in the San Francisco Estuary will also be included.

Estimated Cost: $1,234,396
Funding Source: Prop 50 (DFG)
Participating Agencies: California State Coastal Conservancy
Milestone(s): 39, 112
Task Category: Monitoring and Research (Implementation Year 6)

Sacramento River - Chico Landing Subreach Habitat Restoration
Will implement restoration planning and research on three sites within the Chico Landing Sub-reach (RM 178-206) in preparation for future restoration, and in a set of reference sites that were previously restored by a contractor 5-13 years ago. All sites are located within a portion of the Sacramento River Conservation Area.

Estimated Cost: $3,500,000
Funding Source: Prop 204, Ch 7
Participating Agencies: CBDA
Milestone(s): 59, 60, 62
Task Category: Implementation

Sacramento River Riparian Monitoring and Assessment Consolidated Projects (2004 Monitoring PSP)
This project will measure a range of physical and biological indicators for ERP and AFRP-funded projects within the Sacramento River Ecological Management Zone between Red Bluff and Colusa and compare them to previous conditions and reference systems to test whether restoration actions have improved riparian forest conditions and forest interactions with aquatic processes.

Estimated Cost: $2,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CSU Chico, DFG, River Partners, The Nature Conservancy
Milestone(s): 58, 60
Task Category: Monitoring and Research - Reconsider if Revised (Implementation Year 6)

Liberty Island Restoration Monitoring

Lower Yolo Bypass technical site evaluation, monitoring, and feasibility assessment. Several issues need to be addressed to assess long-term ownership, restoration potential, and management of publicly-owned properties in the Lower Yolo Bypass. In order to evaluate management needs, agency staff will assess property management issues such as liability hazards, access, and vegetation management. Concurrent with this assessment will be an evaluation of physical and geomorphic processes, development of predictive tools addressing controls on vegetation colonization as well as potential flood control implications, and monitoring ecological responses of aquatic food web, native fish and wildlife species, along with water quality monitoring. The BREACH III proposal, which was recommended for funding with future funds by the Science Program PSP Selection Panel, may be considered for achieving the physical and geomorphic processes evaluation.

Estimated Cost: $1,500,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, NOAA Fisheries, USFWS, Yolo Basin Foundation
Milestone(s): 1, 6, 7, 8, 9, 13, 16, 31
Task Category: Monitoring and Research

Yolo Bypass Strategic Plan support

Collaborative process to resolve Lower Bypass management concerns. Using a consensus-seeking, formal collaborative process, facilitated by the Center for Collaborative Policy, local stakeholders will develop their recommendations regarding future management, actions, responsibilities, oversight, monitoring, public access, potential liabilities, funding and regulatory needs of the Lower Yolo Bypass. Participants will include local landowners, reclamation districts, and local, state and federal agencies.

Estimated Cost: $300,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, NOAA Fisheries, USFWS, Yolo Basin Foundation
Milestone(s): 1, 6, 7, 8, 9, 13, 16, 31, 78
Task Category: Planning

Suisun Marsh Plan (SMP)

The ERP Implementing Agencies as well as CDWR, USBR, Suisun Resource Conservation District (SRCD), and the CBDA continue to participate in preparing the Habitat Management, Preservation, and Restoration Plan for Suisun Marsh (SMP) for the Suisun Marsh Ecological Management Zone.

Estimated Cost: $1,528,000
Funding Source: Bay-Delta Act reappropriated, Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s): encompasses all the Bay Region milestones as they apply to Suisun Marsh (38-53)
Task Category: Planning - DFG Implementation and Program Support

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Wetland response to modified hydrology with respect to salinity management

DFG, Grassland Water District, UC Merced, and Humboldt State University, will collect water quality data in the Grassland Basin and San Joaquin River to further characterize outflow from managed wetlands, determine and compare productivity of differently managed wetlands in the basin, and monitor water bird use of differently managed wetlands. This activity helps address water quality stressors of concern in the San Joaquin River and follows up on the previously funded Grassland Water District project titled Adaptive Real-Time Management of Seasonal Wetlands in the Grassland Water District to Improve Water Quality in the San Joaquin River, CALFED Contract No. ERP-00-FC-B05.

Estimated Cost: $165,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, GWD, HSU, UC Merced
Milestone(s): 96, 101, 102, 104, 105, 107, 108
Task Category: Implementation

The Cosumnes-Yolo Terrestrial-Aquatic Ecotone Project ("COYOTE Project"); A Unified Approach to Monitoring Floodplain and Freshwater Tidal Marsh Restoration in the Cosumnes Preserve and Yolo Bypass (2004 Monitoring PSP)

This project will monitor connectivity and key ecological variables within the Yolo Bypass and the Cosumnes Preserve. The program will take advantage of comparisons between similar ecosystems in the Yolo Bypass and Cosumnes River to assess project performance and the impacts of seasonal and interannual hydrologic variability.

Estimated Cost: $1,500,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DWR
Milestone(s): 1, 14
Task Category: Monitoring and Research - Reconsider if Revised (Implementation Year 6)

Petaluma Marsh Expansion Project: Monitoring and Secondary Test Site for the Integrated Regional Wetland Monitoring Project (2004 Monitoring PSP)

This project monitors effects of restoring tidal wetlands adjacent to Petaluma Marsh for MSCS fish and wildlife.

Estimated Cost: $235,000
Funding Source: Prop 50 (DFG)
Participating Agencies: Marin Audubon Society
Milestone(s): 39, 41, 42
Task Category: Monitoring and Research (Implementation Year 6)

Arundo Donax Eradication and Coordination Program: Monitoring and Evaluation (2004 Monitoring PSP)

This project will monitor sites where the Arundo Eradication and Coordination Program are attempting to eradicate giant reed to determine if their efforts are successful.

Estimated Cost: $111,000
Funding Source: Prop 50 (DFG)
Participating Agencies: Sonoma Ecology Center
Milestone(s): 22, 38, 62
Task Category: Monitoring and Research - Reconsider if Revised (Implementation Year 6)

Mandated Programs

CVPIA Contribution (Anadromous Fish Restoration Program b(1) Anadromous Fish Screen Program b(21) and other category A programs)

According to the ROD, State and Federal funds would provide the bulk of funding, supplemented by Central Valley Project Improvement Act (CVPIA) Restoration Funds. The Anadromous Fish Restoration Program (AFRP) will continue to make reasonable efforts to at least double natural production of anadromous fish. To this end, AFRP will work with local watershed groups and other local partners to carry out locally developed and supported watershed restoration plans, giving priority to actions that restore natural channel and riparian habitat values [CVPIA Section 3406 (b)(1)]. The Anadromous Fish Screen Program (AFSP) plans to screen the largest diversions on the Sacramento River as diverters volunteer and funds become available. AFSP screens contribute to the "at least doubling" Central Valley anadromous fish populations CVPIA goal; these screens are also important to protect listed and candidate species such as the winter-run and spring-run Chinook salmon, Delta smelt, steelhead trout, and splittail [CVPIA Section 3406(b)(21)].

Estimated Cost: $15,000,000
Funding Source: CVPIA Restoration Fund
Participating Agencies: USFWS
Milestone(s): 12, 13, 18, 21, 23, 44, 54, 62, 67, 68, 69, 70, 71, 72, 90, 94, 95, 97, 98, 99
Task Category: Implementation

Assistance to Farmers Integrating Agricultural Activities with Ecosystem Restoration

Assisting Farmers in Integrating Agricultural Activities with Ecosystem Restoration

Chapter 7 of Proposition 50 states that "not less that $20 million shall be allocated for projects that assist farmers in integrating agricultural activities with ecosystem restoration." During Year 6, ERP will dedicate funds in this category to a focused solicitation and directed actions to implement projects that benefit fish, GGS, and other MSCS species on agricultural lands and technical assistance partnerships to facilitate integration of state-federal-local agricultural programs benefiting MSCS species and habitats. Remaining funds could be used to support targeted agricultural activities benefiting wildlife and fish and will identify funding priorities, priority practices, and geographical focus areas for projects that assist farmers in integrating agricultural activities with ecosystem restoration, monitoring, research, and implementation.

Estimated Cost: $17,900,000
Funding Source: Prop 50 AFI (CBDA), Prop 50 AFI (DFG)
Participating Agencies: CBDA, CDFA, DFG, DOC, NRCS, USFWS, USGS
Milestone(s): 6, 61, 91
Task Category: Implementation

Technical assistance partnerships to integrate agricultural activities with ecosystem restoration

ERP will increase its cooperative efforts with organizations such as USDA's Natural Resources Conservation Service (NRCS), Resource Conservation Districts, and other technical non-profit agencies to provide technical assistance to landowners to implement agricultural activities benefiting MSCS wildlife and fish. This effort will provide a linkage between state and federal programs and help develop the institutional capacity of implementing agencies and cooperators to support agricultural activities benefiting wildlife and fish.

Estimated Cost: $430,000
Funding Source: Prop 50 AFI (CBDA), Prop 50 AFI (DFG)
Participating Agencies: CBDA, DFG, DOC, NRCS, USFWS
Milestone(s): 6, 61, 91
Task Category: Implementation

Mine Remediation and San Joaquin River Dissolved Oxygen Projects

Mine Remediation Projects

Prop.13 provides $15 million for mine remediation projects. Priorities ought to include process studies that can assist with understanding resource management actions that can reduce methylmercury production and mine remediation projects. Highest priority will be given to projects that can provide improvements in water quality in areas of interest for restoration or habitat for key species.

Estimated Cost: $319,809
Funding Source: Prop 13
Participating Agencies: CBDA
Milestone(s): 31, 78
Task Category: Implementation

San Joaquin River Dissolved Oxygen (DO) Issues

Prop. 13 directs that funds be spent to complete the various studies and pilot demonstration projects designed to study sources, causes, and methods to correct dissolved oxygen depletion in the Stockton Deep Water Shipping Channel.

Estimated Cost: $13,575,693
Funding Source: Prop 13
Participating Agencies: CBDA, CVRWQCB
Milestone(s): 26, 100
Task Category: Implementation

Other

Additional milestones projects based on annual milestones assessment

Milestones are a list of ERP, Multi-Species Conservation Strategy (MSCS), and Water Quality Program actions the CALFED Program will implement in Stage 1 to address covered species. The MSCS-ERP Milestones represent the ERP Agencies' objectives for ERP implementation that would allow covered species to make significant progress toward restoration and recovery. As stated in the ROD, the ERP Agencies will revise the milestones as necessary. During Year 5, a milestones assessment was completed and a long-term program of milestone assessment will be developed to ensure that the ERP and MSCS are implemented in a manner and to an extent sufficient to sustain programmatic FESA, CESA, and NCCPA compliance for all Program elements.

Estimated Cost: $5,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s):
Task Category: Implementation

Staff

CBDA ERP Oversight and Coordination

Funding for permanent CBDA staff assigned to oversight and coordination of ERP implementation and associated administrative costs.

Estimated Cost: $1,546,000
Funding Source: General Fund, Prop 13, Prop 50 (CBDA)
Participating Agencies: CBDA
Milestone(s): 1 - 119
Task Category: Oversight and Coordination - CBDA Implementation and Program Support

CBDA Internal Contracts

CBDA contracts with various entities such as Jones & Stokes, the Science Board, and DFG to carry out activities associated with the ERP.

Estimated Cost: $500,000
Funding Source: Prop 204, Ch 7
Participating Agencies: CBDA
Milestone(s): 1 - 119
Task Category: Oversight and Coordination

DWR ARPI (Yolo Basin Studies) Staffing

ARPI is designed to help carryout the ERP actions and programs in the Yolo Basin with local support. Pilot-scale restoration improvements and baseline studies were identified and will be implemented over the next several years. ARPI is working to incorporate bypass-scale restoration into the Sacramento Area Flood Control Agency's Lower Sacramento River Regional Project.
(Budget change proposal)

Estimated Cost: $1,000,000
Funding Source: Prop 50 (DWR)
Participating Agencies: DWR
Milestone(s): 6, 8, 13, 17, 54, 62, 70
Task Category: Planning

ERP Grant Management

Funding for eleven permanent DFG staff assigned to coordinate ERP implementation with other restoration activities such as CVPIA and associated administrative costs.

Estimated Cost: $1,871,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Implementation - DFG Implementation and Program Support

ERP Database Strategy Development and Implementation

Continued support for the ERP database, web based interface, GIS digitizing support, and data entry.

Estimated Cost: $150,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Implementation - DFG Implementation and Program Support

Fish and Wildlife Planning

USFWS, as an ERP Implementing Agency, will continue ERP planning efforts in collaboration with NOAA Fisheries, CDFG and CBDA. Comprehensive efforts are currently underway to develop regional ecosystem restoration plans for areas such as Suisun Marsh and the Delta. USFWS, through an interagency process, is also involved in planning and developing the format and guidelines for preparing Action Specific Implementation Plans (ASIPs) for all CALFED projects in order to meet the requirement of FESA, CESA, and NCCPA. USFWS will continue planning efforts regarding the ERP PSP process and the USFWS continues to manage existing CALFED contracts that meet ERP goals and objectives. USFWS will continue efforts for the annual milestones assessments and other annual reporting requirements including the Multi-Year Program Plan.

Estimated Cost: $1,292,000
Funding Source: Federal
Participating Agencies: USFWS
Milestone(s): 1 - 119
Task Category: Planning - US Fish and Wildlife Implementation and Program Support

Fish Passage Improvement Program (FPIP) Staff

The Fish Passage Improvement Program (FPIP) developed an Interagency Review Team (IRT), whose role is program oversight, includes representatives from the ERP implementing agencies and FPIP staff. FPIP staff will continue to study and evaluate constructed structures that impede anadromous fish migration and assist with engineering and environmental evaluations for migration barrier structure removal or modification within the ERP focus area. This work will occur under the auspices of the teams preparing and implementing the four regional restoration plans. (Budget change proposal)

Estimated Cost: $1,114,000
Funding Source: Prop 50 (DWR)
Participating Agencies: DWR
Milestone(s): 18, 21, 44, 67, 68, 69, 70, 71, 72, 97, 99
Task Category: Planning

Genetic/Scale Tissue Archive

Funding for continued development and coordination of historic Central Valley genetics/scale tissue archive and database. Historic scale/tissue collections in Arcata, Fresno, and other locations will be cataloged, entered into a database, and made part of the existing DFG Central Valley genetics tissue archive; collections will be provided for research purposes according to standard protocols.

Estimated Cost: $344,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 118, 119
Task Category: Implementation - DFG Implementation and Program Support

Non-native Invasive Species (DFG)

DFG will work with the USFWS NIS Agency and Stakeholder Teams to implement and administer the NIS program, as developed and documented in the NIS Strategic and Implementation Plans.

Estimated Cost: $100,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 20, 22
Task Category: Implementation - DFG Implementation and Program Support

Non-Native Invasive Species (USFWS)

USFWS will continue to work with the NIS Agency and Stakeholder Teams to implement and administer the NIS program, as developed and documented in the NIS Strategic and Implementation Plans.

Estimated Cost: $200,000
Funding Source: Prop 50 (DFG)
Participating Agencies: USFWS
Milestone(s): 20, 22
Task Category: Implementation - DFG Implementation and Program Support

Regional Implementation Coordination

Funding for 5.25 permanent DFG staff assigned to implement the ERP grant management program and associated administrative costs. BCP 01-02?

Estimated Cost: $835,358
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Implementation - DFG Implementation and Program Support

Regional Planning and Implementation Support

Funding for twelve permanent DFG staff assigned to prepare and maintain regional ERP implementation plans and to support ongoing implementation activities. This includes staff support for initiating work on the Sacramento River Regional Ecosystem Restoration Implementation Plan and the San Joaquin River Regional Ecosystem Restoration Implementation Plan (BCP 04-05).

Estimated Cost: $1,007,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Planning - DFG Implementation and Program Support

Restoration, Screens, etc.

NOAA Fisheries supports the ERP goals and efforts by providing expertise regarding restoration and fish screen projects.

Estimated Cost: $800,000
Funding Source: Federal
Participating Agencies: NOAA Fisheries
Milestone(s): 1 - 119
Task Category: Planning

CA Dept of Food and Ag

The California Department of Food and Agriculture will provide staffing to support implementation of exotic species control measures, agriculture related water quality improvement measures, and wildlife friendly agriculture projects.

Estimated Cost: $100,000
Funding Source: Prop 50 (CBDA)
Participating Agencies: Unknown
Milestone(s):
Task Category: Planning

Data integration on water and sediment quality and fish contamination

CDWR leads a multi-agency coordinated effort to develop and implement a database for reporting water, sediment and tissue data to facilitate data sharing and web-based availability. Funds are to continue implementing the refined database for new data collection projects and to convert the existing data sets into the new format.

Estimated Cost: $150,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DWR
Milestone(s):
Task Category: Implementation

Table 4. Future Priority Needs and Projects for Years 7 through 9

Table 4. Future Priority Needs and Projects for Years 7 - 9

At-Risk Delta Dependent Fish Species
Native Anadromous Fish

Coleman Intake Screens

Water intake structures at the Coleman National Fish Hatchery are currently either unscreened or poorly screened and therefore do not meet current criteria for fish screening/protection as prescribed by NOAA Fisheries and the California Department of Fish and Game. Properly screening and/or modifying the intakes will avoid the loss of naturally-produced outmigrating salmon and steelhead juveniles through impingement or entrainment and is an important step in the overall restoration of Battle Creek.

Year(s):07
Estimated Cost Year 7: $5,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: USBR, USFWS
Milestone(s): 69, 72
Task Category: Implementation

Status and Trends/Baseline (Salmonids)

NOAA Fisheries and USFWS reinitiation efforts concerning the efficacy of the EWA and progress toward achieving milestones for the CALFED Bay-Delta Program (September 2004) recommended the CALFED program develop a Central Valley-wide comprehensive status and trends/baseline monitoring program, in coordination with existing monitoring programs, for all salmonids. A comprehensive monitoring program is needed to insure coordinated monitoring efforts, maximize monitoring opportunities, and avoid duplication of effort. Baseline and status and trends monitoring is necessary to measure, assess, and document the effects of CALFED restoration actions contributing toward the recovery of listed species and in achieving the milestones. This program would provide the oversight and guidance necessary to coordinate comprehensive monitoring efforts in the Central Valley for salmonids, including plans and pilot projects that would contribute to this effort, such as DFG's Adult Chinook Salmon Escapement Monitoring Plan and the Central Valley Steelhead Comprehensive Monitoring Plan. NOAA Fisheries reinitiation also identified a need for scientifically sound performance measures to describe and evaluate the benefits of the CALFED program on listed salmonids. This work element would contribute significantly to developing relevant performance measures. This is a long-term project covering years 7, 8, and 9 that will require monitoring, planning and adaptive management.

Year(s): 07
Estimated Cost Year 7: $8,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research

San Joaquin Basin Monitoring

Monitor status and trends of salmonids in Stanislaus, Tuolumne and Merced rivers.

Year(s): 07

Estimated Cost Year 7:$2,250,000
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s):
Task Category: Monitoring and Research

Constant fractional marking

Implementation of a Constant Fractional Marking Program for fall-run Chinook salmon at Central Valley hatcheries. CFM plan developed by the IEP Central Valley Salmonid Project Work Team. Equipment purchase could be accomplished through a Purchase option. A Lease/Purchase option could be considered. It would increase equipment costs by about $500,000 but spread costs over three years. Year 6 funding consists of $25,000 for planning, $4,000,000 for equipment purchases, and $818,000 for initial implementation. Beyond Year 6 costs are solely implementation.

Year(s): 07, 08, 09

Estimated Cost Year 7:$983,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Implementation

Juvenile Outmigrant Sampling

Juvenile outmigrant sampling needs include additional monitoring on the mainstem Sacramento River, discussed in meetings of the IEP Upper Sacramento River Monitoring and Juvenile Monitoring Project Work Teams. Monitoring will improve understanding of winter and spring-run Chinook migration through the Sacramento River prior to entering the Delta.

Year(s):07, 08, 09

Estimated Cost Year 7:$300,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research

Real Time Flow Monitoring in the Sacramento River System

Continue operation and maintenance of stations that monitor stream flows and water quality in four eastside Sacramento River tributaries where the CVPIA has purchased water to maintain instream flows for salmonids: Big Chico, Butte, Deer, and Mill creeks.

Year(s):07
Estimated Cost Year 7: $110,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, DWR
Milestone(s): 66, 115
Task Category: Monitoring and Research - Directed Action

San Joaquin Basin-wide temperature model

DFG will collect, store and manage water temperature and meteorological data in support of Tri-Dam Project's original approved ERP grant to develop a Water Temperature Model on the Stanislaus River; included in this task is expanded sampling on the Tuolumne and Merced rivers to develop a Basin-Wide Water Temperature Model. Year 7 total includes $603,988 contract with Tri-Dam.

Year(s):07, 08
Estimated Cost Year 7: $777,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 84
Task Category: Implementation

EWP (Environmental Water Program)

The EWP is a ROD commitment to improve salmon spawning and juvenile survival in upstream tributaries to the Bay-Delta watershed by purchasing up to 100 TAF annually by the end of Stage 1. The USFWS is leading the EWP efforts to acquire this water.

Year(s):07
Estimated Cost Year 7:$632,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, NOAA Fisheries, USFWS
Milestone(s): 57, 66, 96
Task Category: Implementation

Deer Creek Water Use Efficiency and Ground Water Exchange

Provide 50 cfs at critical times to allow unimpaired passage of spring-run and steelhead. Ten year agreement.

Year(s):08
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s):
Task Category: Implementation

Clear Creek

Implement a large scale adaptive management experiment to recreate geomorphic processes by releasing medium high flows from Whiskeytown Dam. Target flows would be 4,000 to 6,000 cfs for two to three days, three times over a ten-year period with appropriate monitoring.

Year(s):08
Estimated Cost Year 7:$0
Funding Source: Unknown
Participating Agencies: USFWS, DFG, NOAA Fisheries, USBR, BLM, Western Shasta Resource Conservation District
Milestone(s): 57, 66
Task Category: Implementation

Tuolumne River

Currently exploring ways to increase flow on the Tuolumne River and open a dialog with TID and MID.

Year(s): 08
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: USFWS, DFG, NOAA Fisheries
Milestone(s): 96
Task Category: Implementation

Antelope Creek fish passage

Provide permanent 50 cfs from March through June for fall-run Chinook, spring-run Chinook salmon, and Central Valley steelhead.

Year(s):08
Estimated Cost Year 7:$0
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s): 57, 66
Task Category: Implementation

Cow Creek and Bear Creek Passage and Flow Improvement

Improve fish passage, flow and aquatic habitat conditions for Central Valley steelhead.

Year(s):08
Estimated Cost Year 7:$0
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s): 57, 66
Task Category: Implementation

The M&T/Llano Seco Pumping and Fish Screen Project

This project involves developing a long-term solution for protecting operations of the M&T/Llano Seco diversion pumps. River meander and sediment deposition continues to threaten operations and safety of the pumping facility, which supplies water to farmland and USFWS and CDFG refuge lands. This funding will support studies to develop a long-term solution.

Year(s):07
Estimated Cost Year 7: $12,000,000
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s): 67, 72
Task Category: Implementation

Rim Dam fish passage evaluation (NOAA NMFS)

Evaluate salmonid passage feasibility above the rim dams of the Central Valley.

Year(s):07
Estimated Cost Year 7:$1,000,000
Funding Source: Unknown
Participating Agencies: NOAA Fisheries
Milestone(s): 67, 72
Task Category: Planning

Dutch Slough Restoration

Restore a portion of Dutch Slough and conduct adaptive management experiments; research

Year(s):08
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: DFG
Milestone(s):
Task Category: Implementation

Passage at Red Bluff Diversion Dam

Finalize analysis of alternatives to improve passage for anadromous fish at Red Bluff Diversion Dam and implement the preferred alternative.

Year(s):08, 09
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: DFG, NOAA Fisheries, USFWS
Milestone(s):
Task Category: Implementation

Non-Native Invasive Species

Lake Davis Pike Eradication Planning and Implementation

DFG will analyze alternatives through the CEQA/NEPA process and develop an implementation plan for ridding northern pike from Lake Davis. DFG, in collaboration with stakeholders and other agencies, will conduct planning during Years 6 through 7 which will consist of developing alternatives, conducting an initial study, filing a Notice of Preparation, scoping, and EIR/EIS development. Implementation starts in Year 8 following obtaining the required permits. Post project monitoring will occur to assess the success of the eradication efforts.

Year(s):07, 08, 09
Estimated Cost Year 7: $7,900,000
Funding Source: General Fund, Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 22
Task Category: Implementation

Zebra Mussel Rapid Response

This project will build on established partnerships and leverage federal monies that were used to establish a rapid response plan for zebra mussels in California. The new action items would be to enhance the current plan and develop a working group that would implement the plan and begin working on addressing commitments and responses to the introduction of zebra mussels into California waterways. The actions would be involvement of NISAC as short term Ad Hoc committee and the team would evolve to address other NIS issues as the team builds capacity. These funds would be competed.

Year(s):07
Estimated Cost Year 7:$50,000
Funding Source: Prop 50 (DFG)
Participating Agencies: Unknown
Milestone(s): 22
Task Category: Implementation

Zebra Mussel Prevention

This project will build on established partnerships and leverage federal monies used to address the prevention of zebra mussels entering into California waterways. The new action items will build on USFWS projects that targeted pathways for zebra mussels by surveying tailored boats and enhance traveler awareness by expanding these surveys as well as implementing Traveler Information Systems (TIS) in California. This two prong approach will assist with targeting areas where the California TIS system will need to be placed as well as integrating with the current TIS that the 100th Meridian Group (FWS) has in the Western United States. These funds would be competed (grants.gov)

Year(s): 07
Estimated Cost Year 7: $67,000
Funding Source: Prop 50 (DFG)
Participating Agencies: Unknown
Milestone(s): 22
Task Category: Implementation

Delta Pelagic Fishes

Blacklock Tidal Marsh Habitat Restoration Project

Restore tidal action to a 70 acre parcel of Blacklock Ranch in Suisun Marsh. Restore the Blacklock property to self-sustaining functioning brackish tidal marsh by restoring tidal action, reversing subsidence, and promoting establishment of native vegetation and a tidal marsh channel network appropriate to this location within the San Francisco Estuary. This project will contribute to CALFED's ERPP goal of restoring 5,000-7000 acres of tidal wetlands in Suisun Marsh.

Year(s): 07
Estimated Cost Year 7: $1,400,000
Funding Source: Unknown
Participating Agencies: DFG, DWR, USFWS
Milestone(s): 39, 40, 41, 42
Task Category: Implementation

Restoration of Cullinan Ranch

Restoration of tidal marshes and sloughs.

Year(s):07, 08
Estimated Cost Year 7: $3,500,000
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s): 39, 40, 41, 42
Task Category: Implementation

Calhoun Cut Restoration

Restoration based on plan prepared by Solano Land Trust (ERP-02D-P54).

Year(s): 08, 09
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s): 39, 40, 41, 42
Task Category: Implementation

Pelagic Fish Species Scientific Investigations

Conduct preliminary investigations to identify high priority research needs to address the decline in pelagic organisms in the Delta. Implement selected research projects developed by the IEP Pelagic Organisms Decline (POD) effort.

Year(s): 07
Estimated Cost Year 7: $2,000,000
Funding Source: Unknown
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research

Delta Regional Ecosystem Restoration Implementation Plan (DRERIP)

The DRERIP is the first of four regional plans envisioned in the ERP Strategic Plan, and will refine the ERP planning foundation specific to the Delta region. Funding is for federal implementing agency and consultant support

Year(s):07
Estimated Cost Year 7: $300,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s): 1 - 37
Task Category: Planning - DFG Implementation and Program Support

Aquatic Monitoring (IEP+)

Expansion of existing IEP aquatic monitoring activities necessary to measure the indicators and develop the performance measures to assess the effectiveness of the ERP on restoring aquatic resources. This will supplement the POD efforts described in the pelagic fish species scientific investigations project.

Year(s): 07, 08, 09
Estimated Cost Year 7: $5,000,000
Funding Source: Unknown
Participating Agencies: DFG
Milestone(s): 112, 119
Task Category: Monitoring and Research

Hamilton Airfield/Bel Marin Keys (BMK) Wetland Restoration

Restore San Pablo Bay tidal creeks and marshes by implementing the Hamilton Air Force Base - Bel Marin Keys wetlands restoration plan. MSCS fish and wildlife will benefit from these habitats.

Year(s): 07, 08, 09

Estimated Cost Year 7: $0
Funding Source: Federal
Participating Agencies: State Coastal Commission, USACE
Milestone(s): 39, 41, 42
Task Category: Implementation

Napa Salt Ponds Restoration

This project would implement the Napa salt marsh restoration project by restoring 10,000 acres of tidal creeks, marshes and managed ponds to this property to support anadromous and resident estuarine fish and wildlife, including endangered species, waterfowl, and shorebirds.

Year(s):07

Estimated Cost Year 7: $266,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, USACE
Milestone(s):
Task Category: Implementation

Napa Salt Ponds Monitoring

This project would monitor the 10,000 acre Napa Salt Marsh Restoration projects effects on fish, wildlife and the Napa River estuary.

Year(s):07, 08
Estimated Cost Year 7: $666,666
Funding Source: Unknown
Participating Agencies: DFG, USACE
Milestone(s): 39, 40, 41, 42
Task Category: Monitoring and Research

Tidal Restoration of Lands Acquired through CALFED Grant ERP-01-C04 "Suisun Marsh Property Acquisition and Habitat Restoration"

Implement next phase tidal wetland restoration of acquired property in the Suisun Marsh. Restore land to a fully functioning self- sustaining tidal wetland ecosystem which includes low-marsh, high-marsh, and upland transition zones, increasing the area and contiguity of saline emergent wetlands thereby assisting in the recovery of at-risk species.

Year(s):08
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: DFG
Milestone(s): 38, 39, 42
Task Category: Implementation

Tidal restoration of Mien's Landing in the Suisun Marsh

Complete the environmental documentation and permitting for a multi-phased project to restore tidal action to seasonal and permanent wetlands in the Suisun Marsh.

Year(s):08
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: DFG, DWR
Milestone(s): 39, 40, 41, 42
Task Category: Implementation

Tidal Restoration of Hill Slough Parcel in Suisun Marsh

Restore tidal creeks and wetlands adjacent to Suisun Marsh's Hill Slough to benefit estuarine fish and tidal marsh plants and wildlife.

Year(s): 07, 08
Estimated Cost Year 7: $2,000,000
Funding Source: Unknown
Participating Agencies: Unknown
Milestone(s): 39, 40, 41, 42
Task Category: Implementation

Multiple Species

Additional Milestones Projects for Other At-Risk Species Affected by Water Projects Operations, Based on Annual Milestones Assessments

In the consultation letters sent in September 200, the USFWS and NOAA Fisheries noted that work on specific milestones needed to continue or be started. Funds expended to meet the requirements listed in the consultation letters may include fish passage or water acquisition projects. Milestones are a list of ERP, Multi-Species Conservation Strategy (MSCS), and Water Quality Program actions the CALFED Program will implement in Stage 1 to address covered species. The MSCS-ERP Milestones represent the ERP Agencies' objectives for ERP implementation that would allow covered species to make significant progress toward restoration and recovery. As stated in the ROD, the ERP Agencies will revise the milestone as necessary. During year 6, a long-term program of milestone assessment will be developed to ensure that the ERP and MSCS are implemented in a manner and to an extent sufficient to sustain programmatic FESA, CESA, and NCPPA compliance for all Program elements. Projects that could be considered under this item include Science Program recommendations relevant to ERP goals and objectives like the "Determination of Age Structure of Central Valley Salmon" analysis and the BREACH III effort.

Year(s): 07
Estimated Cost Year 7: $5,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s): 1, 2, 3, 17, 18, 21, 23, 24, 25, 33, 34, 36, 37, 44, 49, 50, 52, 53, 55, 57, 66, 67, 68, 69, 70, 71, 72, 74, 75, 78, 80, 81, 82, 83, 112, 119
Task Category: Implementation

Terrestrial and Other Aquatic Milestones and Targets

Various other milestones, targets, and actions that have a less direct linkage to the restoration of aquatic resources that have the most influence over export facility operations.

Year(s): 09
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: DFG
Milestone(s):
Task Category: Planning

Invasive Spartina Control Implementation in the San Francisco Estuary

Invasive Spartina control monitoring in the San Francisco Estuary The proposed project will monitor marsh areas treated to control Atlantic cordgrass and its (Approved monitoring grant) hybrids to determine if treatment was effective. Annual regional surveys for nonnative cordgrasses in the San Francisco Estuary will also be included.

Year(s): 07
Estimated Cost Year 7: $1,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: Unknown
Milestone(s): 39, 112
Task Category: Implementation

McCormack-Williamson Tract

Restoration being planned as part of the North Delta flood control and ecosystem restoration project.

Year(s): 08
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: DFG, DWR
Milestone(s): 12, 13
Task Category: Implementation

Sacramento River Conservation Area Forum Base Funding

As part of its commitment to protect and restore the Sacramento River meander corridor, ERP set as a Stage 1 priority assistance to the Sacramento River Conservation Area Forum. The forum provides essential and critical stakeholder involvement in the restoration efforts along the Sacramento River.

Year(s): 07
Estimated Cost Year 7: $300,000
Funding Source: Prop 50 (DFG), Prop 50 AFI (DFG)
Participating Agencies: Unknown
Milestone(s): 59, 60, 61, 62, 63, 64, 112
Task Category: Planning

Suisun Marsh Plan (SMP)

The ERP Implementing Agencies as well as CDWR, USBR, Suisun Resource Conservation District (SRCD), and the CBDA continue to participate in preparing the Habitat Management, Preservation, and Restoration Plan for Suisun Marsh (SMP) for the Suisun Marsh Ecological Management Zone.

Year(s): 07
Estimated Cost Year 7: $115,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s): encompasses all the Bay Region milestones as they apply to Suisun Marsh (38-53)
Task Category: Planning - DFG Implementation and Program Support

Wetland response to modified hydrology with respect to salinity management

DFG, Grassland Water District, UC Merced, and Humboldt State University, will collect water quality data in the Grassland Basin and San Joaquin River to further characterize outflow from managed wetlands, determine and compare productivity of differently managed wetlands in the basin, and monitor water bird use of differently managed wetlands. This activity helps address water quality stressors of concern in the San Joaquin River and follows up on the previously funded Grassland Water District project titled Adaptive Real-Time Management of Seasonal Wetlands in the Grassland Water District to Improve Water Quality in the San Joaquin River, CALFED Contract No. ERP-00-FC-B05.

Year(s): 07, 08
Estimated Cost Year 7: $135,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG, GWD, HSU, UC Merced
Milestone(s): 96, 101, 102, 104, 105, 107, 108
Task Category: Implementation

Conduct Comprehensive Terrestrial Monitoring

Terrestrial monitoring necessary to measure the indicators and develop the performance measures to assess the effectiveness of the ERP on restoring terrestrial resources.

Year(s): 07, 08, 09
Estimated Cost Year 7: $1,500,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112
Task Category: Implementation

Mandated Programs

CVPIA Contribution (Anadromous Fish Restoration Program b(1) Anadromous Fish Screen Program b(21) and other category A programs)

According to the ROD, State and Federal funds would provide the bulk of funding, supplemented by Central Valley Project Improvement Act (CVPIA) Restoration Funds. The Anadromous Fish Restoration Program (AFRP) will continue to make reasonable efforts to at least double natural production of anadromous fish. To this end, AFRP will work with local watershed groups and other local partners to carry out locally developed and supported watershed restoration plans, giving priority to actions that restore natural channel and riparian habitat values [CVPIA Section 3406 (b)(1)]. The Anadromous Fish Screen Program (AFSP) plans to screen the largest diversions on the Sacramento River as diverters volunteer and funds become available. AFSP screens contribute to the "at least doubling" Central Valley anadromous fish populations CVPIA goal; these screens are also important to protect listed and candidate species such as the winter-run and spring-run Chinook salmon, Delta smelt, steelhead trout, and splittail [CVPIA Section 3406(b)(21)].

Year(s): 07
Estimated Cost Year 7: $15,000,000
Funding Source: CVPIA Restoration Fund
Participating Agencies: USFWS
Milestone(s): 12, 13, 18, 21, 23, 44, 54, 62, 67, 68, 69, 70, 71, 72, 90, 94, 95, 97, 98, 99
Task Category: Implementation

South Delta Habitat

This item is to ensure that funding allocated in Proposition 204 related to the permanent barriers element of the South Delta Improvements Program contributes effectively to ERP implementation in support of the Delta Improvements Package actions related to water project operations in the Delta that will result in increased water supply reliability, improved water quality, environmental protection and ecosystem restoration, protection of the Delta Levee system, and analyses and evaluation to support improved real-time and long-term management. The Delta Improvements Package also outlines conditions under which the SWP would be allowed to increase its permitted export pumping capacity from 6,680 to 8,500 cubic feet per second.

Year(s): 07
Estimated Cost Year 7: $9,500,000
Funding Source: Prop 204, Ch 4, article 5
Participating Agencies: DWR
Milestone(s): 1, 13, 17, 18, 23, 24
Task Category: Implementation

Assistance to Farmers Integrating Agricultural Activities with Ecosystem Restoration

Technical assistance partnerships to integrate agricultural activities with ecosystem restoration

ERP will increase its cooperative efforts with organizations such as USDA's Natural Resources Conservation Service (NRCS), Resource Conservation Districts, and other technical non-profit agencies to provide technical assistance to landowners to implement agricultural activities benefiting MSCS wildlife and fish. This effort will provide a linkage between state and federal programs and help develop the institutional capacity of implementing agencies and cooperators to support agricultural activities benefiting wildlife and fish.

Year(s): 07
Estimated Cost Year 7: $500,000
Funding Source: Prop 50 AFI (CBDA), Prop 50 AFI (DFG)
Participating Agencies: CBDA, DFG, DOC, NRCS, USFWS
Milestone(s): 6, 61, 91
Task Category: Implementation

Aquatic milestones and targets

Research program actions that will address milestones, targets, and actions strongly linked to the recovery of at-risk native fish species that are greatly affected by, and in turn strongly affect, the operation of the State Water Project and Central Valley Project export facility operations in the Delta.

Year(s): 08, 09
Estimated Cost Year 7: $0
Funding Source: Unknown
Participating Agencies: DFG, USFWS, CBDA, NOAA Fisheries
Milestone(s): 112, 113, 115, 116, 117, 118, 119
Task Category: Implementation

Mine Remediation and San Joaquin River Dissolved Oxygen Projects

Mine Remediation Projects

Prop.13 provides $15 million for mine remediation projects. Priorities ought to include process studies that can assist with understanding resource management actions that can reduce methylmercury production and mine remediation projects. Highest priority will be given to projects that can provide improvements in water quality in areas of interest for restoration or habitat for key species.

Year(s): 07
Estimated Cost Year 7: $5,000,000
Funding Source: Prop 13
Participating Agencies: CBDA
Milestone(s): 31, 78
Task Category: Implementation

San Joaquin River Dissolved Oxygen (DO) Issues

Prop. 13 directs that funds be spent to complete the various studies and pilot demonstration projects designed to study sources, causes, and methods to correct dissolved oxygen depletion in the Stockton Deep Water Shipping Channel.

Year(s): 07
Estimated Cost Year 7: $3,500,000
Funding Source: Prop 13
Participating Agencies: CBDA, CVRWQCB
Milestone(s): 26, 100
Task Category: Implementation

Other

Additional milestones projects based on annual milestones assessment

Milestones are a list of ERP, Multi-Species Conservation Strategy (MSCS), and Water Quality Program actions the CALFED Program will implement in Stage 1 to address covered species. The MSCS-ERP Milestones represent the ERP Agencies' objectives for ERP implementation that would allow covered species to make significant progress toward restoration and recovery. As stated in the ROD, the ERP Agencies will revise the milestones as necessary. During Year 5, a milestones assessment was completed and a long-term program of milestone assessment will be developed to ensure that the ERP and MSCS are implemented in a manner and to an extent sufficient to sustain programmatic FESA, CESA, and NCCPA compliance for all Program elements.

Year(s): 07
Estimated Cost Year 7: $5,000,000
Funding Source: Prop 50 (DFG)
Participating Agencies: CBDA, DFG, NOAA Fisheries, USFWS
Milestone(s):
Task Category: Implementation

Staff

CBDA ERP Oversight and Coordination

Funding for permanent CBDA staff assigned to oversight and coordination of ERP implementation and associated administrative costs.

Year(s): 07, 08, 09
Estimated Cost Year 7: $1,546,000
Funding Source: General Fund, Prop 13, Prop 50 (CBDA)
Participating Agencies: CBDA
Milestone(s): 1 - 119
Task Category: Oversight and Coordination - CBDA Implementation and Program Support

CBDA Internal Contracts

CBDA contracts with various entities such as Jones & Stokes, the Science Board, and DFG to carry out activities associated with the ERP.

Year(s): 07
Estimated Cost Year 7: $500,000
Funding Source: Prop 204, Ch 7
Participating Agencies: CBDA
Milestone(s): 1 - 119
Task Category: Oversight and Coordination

DWR ARPI (Yolo Basin Studies) Staffing

ARPI is designed to help carryout the ERP actions and programs in the Yolo Basin with local support. Pilot-scale restoration improvements and baseline studies were identified and will be implemented over the next several years. ARPI is working to incorporate bypass-scale restoration into the Sacramento Area Flood Control Agency's Lower Sacramento River Regional Project. (Budget change proposal)

Year(s): 07, 08, 09
Estimated Cost Year 7: $1,000,000
Funding Source: Prop 50 (DWR)
Participating Agencies: DWR
Milestone(s): 6, 8, 13, 17, 54, 62, 70
Task Category: Planning

ERP Grant Management

Funding for eleven permanent DFG staff assigned to coordinate ERP implementation with other restoration activities such as CVPIA and associated administrative costs.

Year(s): 07, 08, 09
Estimated Cost Year 7: $1,871,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Implementation - DFG Implementation and Program Support

ERP Database Strategy Development and Implementation

Continued support for the ERP database, web based interface, GIS digitizing support, and data entry.

Year(s): 07, 08, 09
Estimated Cost Year 7: $150,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Implementation - DFG Implementation and Program Support

Fish and Wildlife Planning

USFWS, as an ERP Implementing Agency, will continue ERP planning efforts in collaboration with NOAA Fisheries, CDFG and CBDA. Comprehensive efforts are currently underway to develop regional ecosystem restoration plans for areas such as Suisun Marsh and the Delta. USFWS, through an interagency process, is also involved in planning and developing the format and guidelines for preparing Action Specific Implementation Plans (ASIPs) for all CALFED projects in order to meet the requirement of FESA, CESA, and NCCPA. USFWS will continue planning efforts regarding the ERP PSP process and the USFWS continues to manage existing CALFED contracts that meet ERP goals and objectives. USFWS will continue efforts for the annual milestones assessments and other annual reporting requirements including the Multi-Year Program Plan.

Year(s): 07, 08, 09
Estimated Cost Year 7: $1,292,000
Funding Source: Federal
Participating Agencies: USFWS
Milestone(s): 1 - 119
Task Category: Planning - US Fish and Wildlife Implementation and Program Support

Fish Passage Improvement Program (FPIP) Staff

The Fish Passage Improvement Program (FPIP) developed an Interagency Review Team (IRT), whose role is program oversight, includes representatives from the ERP implementing agencies and FPIP staff. FPIP staff will continue to study and evaluate constructed structures that impede anadromous fish migration and assist with engineering and environmental evaluations for migration barrier structure removal or modification within the ERP focus area. This work will occur under the auspices of the teams preparing and implementing the four regional restoration plans. (Budget change proposal)

Year(s): 07, 08, 09
Estimated Cost Year 7: $300,000
Funding Source: Prop 50 (DWR)
Participating Agencies: DWR
Milestone(s): 18, 21, 44, 67, 68, 69, 70, 71, 72, 97, 99
Task Category: Planning

Genetic/Scale Tissue Archive

Funding for continued development and coordination of historic Central Valley genetics/scale tissue archive and database. Historic scale/tissue collections in Arcata, Fresno, and other locations will be cataloged, entered into a database, and made part of the existing DFG Central Valley genetics tissue archive; collections will be provided for research purposes according to standard protocols.

Year(s): 07, 08, 09
Estimated Cost Year 7: $344,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 112, 118, 119
Task Category: Implementation - DFG Implementation and Program Support

Non-native Invasive Species (DFG)

DFG will work with the USFWS NIS Agency and Stakeholder Teams to implement and administer the NIS program, as developed and documented in the NIS Strategic and Implementation Plans.

Year(s): 07, 08, 09
Estimated Cost Year 7: $100,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 20, 22
Task Category: Implementation - DFG Implementation and Program Support

Non-Native Invasive Species (USFWS)

USFWS will continue to work with the NIS Agency and Stakeholder Teams to implement and administer the NIS program, as developed and documented in the NIS Strategic and Implementation Plans.

Year(s): 07, 08, 09
Estimated Cost Year 7: $200,000
Funding Source: Prop 50 (DFG)
Participating Agencies: USFWS
Milestone(s): 20, 22
Task Category: Implementation - DFG Implementation and Program Support

Regional Implementation Coordination

Funding for 5.25 permanent DFG staff assigned to implement the ERP grant management program and associated administrative costs. BCP 01-02?

Year(s): 07, 08, 09
Estimated Cost Year 7: $835,358
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Implementation - DFG Implementation and Program Support

Regional Planning and Implementation Support

Funding for twelve permanent DFG staff assigned to prepare and maintain regional ERP implementation plans and to support ongoing implementation activities. This includes staff support for initiating work on the Sacramento River Regional Ecosystem Restoration Implementation Plan and the San Joaquin River Regional Ecosystem Restoration Implementation Plan (BCP 04-05).

Year(s): 07, 08, 09
Estimated Cost Year 7: $1,007,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DFG
Milestone(s): 1 - 119
Task Category: Planning - DFG Implementation and Program Support

Restoration, Screens, etc.

NOAA Fisheries supports the ERP goals and efforts by providing expertise regarding restoration and fish screen projects.

Year(s) 07, 08, 09
Estimated Cost Year 7: $800,000
Funding Source: Federal
Participating Agencies: NOAA Fisheries
Milestone(s): 1 - 119
Task Category: Planning

Data integration on water and sediment quality and fish contamination

CDWR leads a multi-agency coordinated effort to develop and implement a database for reporting water, sediment and tissue data to facilitate data sharing and web-based availability. Funds are to continue implementing the refined database for new data collection projects and to convert the existing data sets into the new format.

Year(s): 07, 08, 09
Estimated Cost Year 7: $150,000
Funding Source: Prop 50 (DFG)
Participating Agencies: DWR
Milestone(s):
Task Category: Implementation

Public Involvement and Outreach

Public and agency involvement through outreach and education has been a focus of the CALFED Bay-Delta Program since its initial stages. These efforts have helped shape the Program as well as the ERP. Since the ROD (August 2000) the ERP has relied on continuous comments and involvement from individuals and groups who have a stake in finding long-term solutions for the problems affecting the Bay-Delta system, focusing on ecosystem restoration efforts.

Participants representing rural, agricultural, municipal, and industrial water users; fishing interests; environmental organizations; businesses; and the general public have helped to define problems and evaluate alternatives to solve the challenges confronting the Bay-Delta system. To date, thousands of Californians have contributed to the Program by participating in public meetings and workshops-volunteering time, sharing expertise, and expressing ideas and opinions.

Broad categories of public involvement and outreach include public participation, agency participation, and science review.

Public Participation

ERP is committed to public participation in implementing its goals and objectives. The following is a list of topics of ERP-focused public meetings or workshops. (See also the section entitled "Integration with Science, Environmental Justice and Tribal Relations.")

- ERP Science Board
- BDPAC Ecosystem Restoration Subcommittee
- BDPAC Working Landscapes Subcommittee

In addition to the many public meetings or workshops, ERP Agencies are active in the following public outreach and education programs:

- ERP provided grants to the Department of Health Services (DHS) to promote better interagency and community collaboration about fish contamination issues, especially outreach and education to at-risk communities and populations which may be disproportionately affected by fish contamination, an environmental justice issue. DHS developed an ongoing interagency technical advisory group, a stakeholder advisory group that develops appropriate educational materials, and provided small grants to community-based organizations to

Yolo Bypass Working Group

The Yolo Bypass Working Group is a good example of how the ERP engages in public outreach. The working group was started by the Yolo Basin Foundation in 1998 using an ERP grant. The working group provides a place where key information and facilitated conversation can be shared by all Yolo Bypass stakeholders: landowners, land tenants, regulatory entities and other interested people.

This stakeholder group meets about every two months. More than 30 people attend these meetings regularly, representing a wide array of stakeholders. These include: landowners (ranchers, farmers and duck club owners); DWR, State Reclamation Board, DFG, USFWS, DFA, CBDA, NRCS, Dixon and Yolo resource conservation districts; Sacramento Area Flood Control Agency; Yolo County; City of West Sacramento; California Water Fowl Association; Ducks Unlimited; NOAA's NMFS; National Weather Service, Sacramento-Yolo Mosquito Vector Control District, the Port of Sacramento and others.

In 2005 topics before the working group included: improving the Sacramento River Flood Control Project, including changes to the Yolo Bypass; conducting the Lower Yolo Bypass Feasibility Study; implementing mosquito control efforts, including those for West Nile Virus; the Yolo Wildlife Area Management Plan, anadromous fish issues, water quality, changes in land ownership and land use, and habitat restoration activities.

develop their own outreach programs. Posters, post cards and brochures were developed in several languages and literacy levels and thousands of these were distributed. DHS also is working with counties and health care providers and providing training and materials to those working with people who may be at risk due to fish contamination.

- Regarding development of a habitat management, preservation and restoration plan for the Suisun Marsh, a website was established[2] , newsletters were distributed, a scoping report for the plan's programmatic EIR/EIR was distributed and made available online[3] , and hosted a *Making Science work for Suisun Marsh Workshop*, through the CALFED Bay-Delta Science Program and the Bay-Delta Science Consortium.

- A recently-funded project to monitor mercury in fish is convening a steering committee with stakeholders and agency participants to provide input about the monitoring program's design; this steering committee will also provide a forum for coordination and education regarding the project's findings.

The ERP Agencies' efforts to integrate agricultural activities with ecosystem restoration include public outreach to farmer organizations, non-governmental organizations, and through several forums that focus on the agriculture and wildlife interface. Among the forums are the USDA's State Technical Advisory Committee, the International Association of Fish and Wildlife Agencies' Agricultural Committee, and regional forums that address sustainable agriculture, such as the Sacramento River Conservation Area Forum, the Sacramento Valley Agricultural Forum, the California Association of Resource Conservation Districts, and the California Coalition for Food and Farming.

Agency Participation

Agency participation in the ERP occurs at both the programmatic and process or project-specific levels. Programmatic-level participation focuses on coordinating planning and implementing the ERP as a whole and in each of the ERP regions. It includes participating in the Implementing Agency Managers meetings and in Restoration Coordinator meetings in each of the ERP regions. Each of these groups is described in the following paragraphs.

The ERP Implementing Agency Managers (ERPIAMs) are managers from the agencies tasked with implementing the ERP under the California Bay-Delta Authority Act. (These are the same agencies that developed the Multi-Species Conservation Strategy for the CALFED Bay-Delta Program.) The ERPIAMS meet at least bi-monthly to ensure coordinated implementation and planning for the ERP, and specifically to guide the activities of the Restoration Coordinators and other ERP Agencies staff.

The Restoration Coordinators are restoration coordinators from the ERP Agencies and staff from the ERP. Each of these restoration coordinators is assigned to geographic regions throughout the ERP's geographic scope and represent their respective agencies and the ERP in developing and nurturing partnerships with local entities to identify priorities and to encourage project development that contribute to ERP goals. The Regional Coordinators also oversee implementation of projects in which the ERP invests funds. The Restoration Coordinators from all four ERP regions meet periodically to coordinate activities throughout the ERP geographic scope. The ERPIAMs and the Chief of the ERP direct the Restoration Coordinators.

[2] (http://www.delta.dfg.ca.gov/suisunmarsh/charter/smip.asp)
[3] (http://www.delta.dfg.ca.gov/suisunmarsh/charter/atlas_documents/Scoping%20Report%205-11-04.pdf

Process or project-specific levels of participation focus on specific topics such as contract management, or on projects such as developing the Mercury Strategy. Specific examples of activities include the ERP Contract Amendment Workshops, the ERP Contracts Administrators meetings, and the DRERIP meetings. Below is a list of process or project-specific meetings that are held regularly.

- ERP Implementing Agency Managers (Bi-Monthly meetings)
- Restoration Coordinators (Quarterly meetings)
- Restoration Coordinators, regional meetings (Bi-monthly meetings)
- ERP Contract Amendment Meeting (Quarterly meetings)
- DRERIP
- Prop. 13 funding decisions for Dissolved Oxygen and Abandoned Mines (Monthly meetings)
- Suisun Marsh Plan (Monthly meetings)

Science Review

The ERP strongly emphasizes a science-based approach to ecosystem restoration and continues to integrate science into all program activities including: (1) collaborative actions with CALFED's Science Program; (2) direct involvement of the CALFED Lead Scientist in developing the project proposal review and project selection process; (3) technical and scientific review of project proposals; (4) support of scientific workshops; (5) support of the ERP Science Board (ERPSB); and (6) support of the evaluation of progress toward achieving the ERP/MSCS ROD milestones.

Each year the ERP is a principle participant in planning and implementing a conference that is open to the public. Information presented at these conferences is pertinent to the Bay-Delta Authority and the problems and solutions faced the program in order to achieve its goals. The conferences are the BDA's Science Conference and the Biennial State of the Estuary Conference; these conferences are held in alternating years.

The Science Conference is organized by multiple concurrent sessions with about 250 oral presentations and 130 poster presentations. This conference has become a major event among national estuary researchers. When the Science Conference began, it focused on technical level presentations of primarily scientific studies. At the 2004 conference, however, the range of topics was expanded to include talks and a panel discussion about BDA environmental justice issues.

The Biennial State of Estuary Conference emphasizes broader issue-based presentations than the Science Conference. The Estuary Conference is a three-day conference providing a series of single-session presentations. These presentations are around a theme selected for the conference that reflects contemporary concerns in the Bay-Delta Estuary. Speakers are selected based on their expertise on the topic; expertise of speakers is varied and has included scientific, political, social, economic, legal and historic backgrounds.

The ERPSB is a group of academic scientists that provides the ERP Agencies with advice and guidance, specifically to establish a solid scientific foundation for the ERP, to help ingrain scientifically-based adaptive management in the implementation of the ERP, and to discuss the scientific and technical questions at the root of policy issues and priorities. The following is a list of the boards, panels, and committees that provide scientific review to the ERP Agencies.

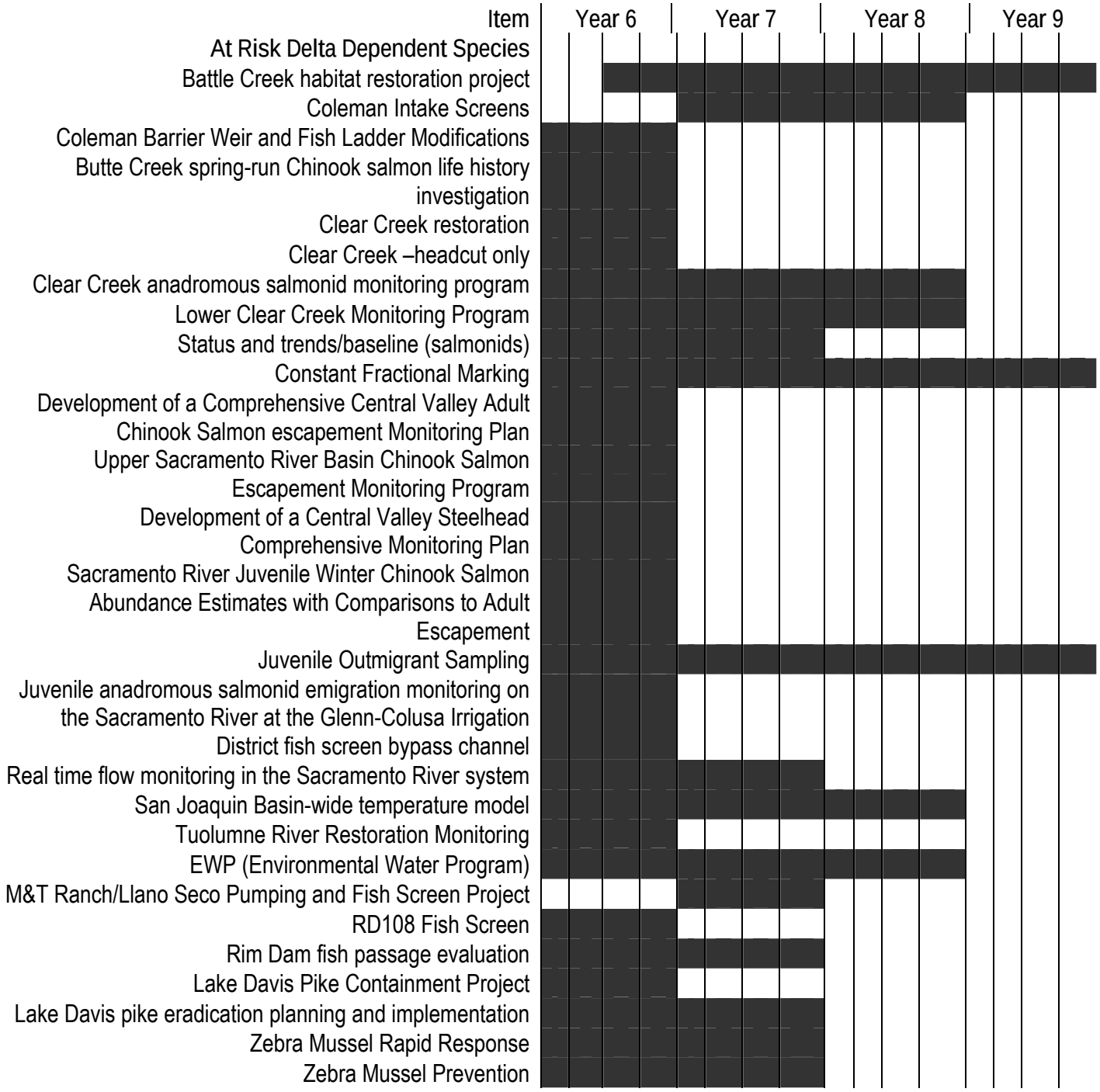
- ERP Science Board
- Issue-specific Scientific/Technical Review Panels
- Directed Action-PSP Technical Review Panels

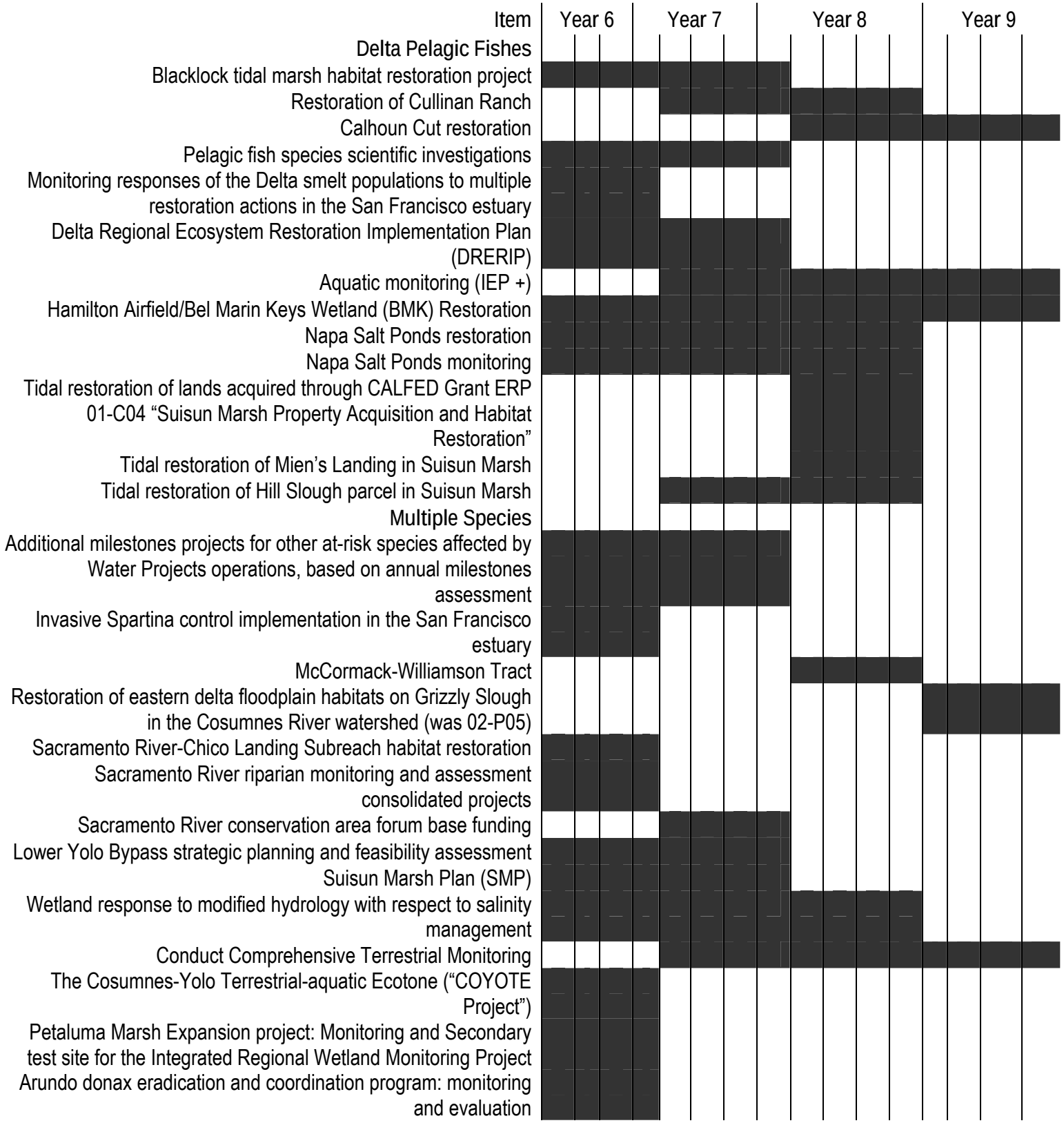
The ERP Agencies will continue to work with the ERPSB, Science Program, and the Authority's Independent Science Board to update the peer review process used in proposal solicitation process, work on performance measures, support continuing the adaptive management forums on the Merced and Tuolumne rivers and Clear Creek, and continue planning and implementing adaptive management experiments developed with the assistance of the ERPSB.

The ERP Agencies are working with the University of California, Davis extension program to provide workshops about mercury research, tidal marshes and floodplains, dissolved organic carbon, and large meandering rivers during Year 6.

Schedule of Anticipated Funding Needs

The following schedule of anticipated funding needs is derived from Tables 3 and 4, the ERP priority needs for Year 6 and future years (7-9). The shading represents when the anticipated funding is needed for the listed project; the project itself may last for several months or years longer than what is shown in the schedule below.




Item
Year 6
Year 7
Year 8
Year 9
Delta Pelagic Fishes
Blacklock tidal marsh habitat restoration project
Restoration of Cullinan Ranch
Calhoun Cut restoration
Pelagic fish species scientific investigations
Monitoring responses of the Delta smelt populations to multiple restoration actions in the San Francisco estuary
Delta Regional Ecosystem Restoration Implementation Plan (DRERIP)
Aquatic monitoring (IEP +)
Hamilton Airfield/Bel Marin Keys Wetland (BMK) Restoration
Napa Salt Ponds restoration
Napa Salt Ponds monitoring
Tidal restoration of lands acquired through CALFED Grant ERP 01-C04 "Suisun Marsh Property Acquisition and Habitat Restoration"
Tidal restoration of Mien's Landing in Suisun Marsh
Tidal restoration of Hill Slough parcel in Suisun Marsh
Multiple Species
Additional milestones projects for other at-risk species affected by Water Projects operations, based on annual milestones assessment
Invasive Spartina control implementation in the San Francisco estuary
McCormack-Williamson Tract
Restoration of eastern delta floodplain habitats on Grizzly Slough in the Cosumnes River watershed (was 02-P05)
Sacramento River-Chico Landing Subreach habitat restoration
Sacramento River riparian monitoring and assessment consolidated projects
Sacramento River conservation area forum base funding
Lower Yolo Bypass strategic planning and feasibility assessment
Suisun Marsh Plan (SMP)
Wetland response to modified hydrology with respect to salinity management
Conduct Comprehensive Terrestrial Monitoring
The Cosumnes-Yolo Terrestrial-aquatic Ecotone ("COYOTE Project")
Petaluma Marsh Expansion project: Monitoring and Secondary test site for the Integrated Regional Wetland Monitoring Project
Arundo donax eradication and coordination program: monitoring and evaluation

Integration with Science, Environmental Justice, and Tribal Relations

Science:

The ERP is committed to a science-based, adaptive management approach to ecosystem restoration. Ensuring the scientific credibility of the ERP is an important responsibility of the Authority and the ERP Agencies because a science-based approach will help maximize the effectiveness of the ERP and build confidence and support for the program's efforts.

The ERP Agencies coordinate with the Science Program to develop Performance Measures and incorporate review, insights, and advice from independent science experts to ensure that the best possible scientific information guides decision-making within the ERP and within programs linked to the ERP. The Science Program's approach for incorporating independent science expertise involves four levels of working groups along with independent peer review by individuals: the CALFED Bay-Delta Program-wide Independent Science Board, program-specific Science Boards[4], Standing Boards[5], and Technical Panels. In Years 1 and 2, the ERP provided more than $15 million to the Science Program to support scientific studies associated with restoration.

The Science Program is involved in ERP efforts, providing assistance in developing the *Draft Stage 1 Implementation Plan*, assisting with external scientific review and research technical review for proposals, and many more scientific review coordination efforts. Science integration into the DRERIP planning effort is facilitated by the Adaptive Management Planning Team (AMPT), a group of agency, academic, and stakeholder scientists. The AMPT is helping the ERP Agencies to make sure that the proposed targets, actions and milestones for the Delta Region have a strong scientific foundation. The Suisun Marsh Plan engaged a Science Advisor to accomplish science integration into that planning effort. A representative from the ERPSB is assisting in both planning efforts.

Several linkages exist between the ERP Agencies and the Science Program to ensure integration and coordination of resource management, policy decision-making, and science program activities. For example, DFG, USFWS, and NMFS are member agencies of the Interagency Ecological Program (IEP) of the Sacramento-San Joaquin Estuary. The Science Program is integrated with the IEP at various levels within the IEP organization and is represented in the IEP Science Advisory Group and Agency Coordinators. The Science Program provides input to the IEP work plan and provides updates of its activities at the annual IEP conference. Another example of integration is the collaboration between ERP, Science Program, and CVPIA Anadromous Fish Restoration Program's independent review processes, including the Adaptive Management Forums for Clear Creek and the Tuolumne and Merced rivers.

The ERP uses these various levels of science boards and panels, and promotes overlap in membership across the panels to provide panelists with an increased understanding of ERP-wide issues. The ERP's Science Board (ERPSB) consists of 13 international and local experts. ERP standing boards (or panels)

[4] Science Boards advise programs regarding the application of science and effectiveness of science practices within that program.
[5] Standing Boards combine the expertise and experience of individuals who together can represent the range of interdisciplinary knowledge of the variety of issues and challenges that converge in a program, a complicated issue, a specific region (e.g., the Delta), or a circumstance where multiple issues need to be addressed.

include the Selection Panel, the Upper Yuba River Studies Technical Review Panel, the Mercury Peer Review Panel, and the Adaptive Management Forum for Large-Scale River Restoration. The ERP plans to initiate additional standing review panels including a Wetland and Floodplain Restoration Standing Review Panel, the Stockton Dissolved Oxygen Review Panel, and a Sacramento River Corridor Restoration Standing Review Panel.

In its draft Annual Report, the ERPSB noted the significant progress the ERP has made in incorporating independent, objective science into program planning and implementation. Notable examples include using outside peer reviews in selecting restoration projects for funding; requiring project applicants to include conceptual models with their project applications; establishing the Adaptive Management Forum to review large-scale river restoration projects; and reviewing and reorganizing the ERP milestones and developing science-based rationale for these milestones.

Even with the progress so far, the ERPSB made several recommendations regarding how the ERP could improve the scientific foundation of its program and more effectively engage science in the management decision making process. Recommendations included:

- Providing more attention to and scientific engagement in the monitoring and assessment aspects of funded restoration projects. These are critical steps in adaptive management. Continuous monitoring (including pre-project monitoring), evaluation, and adaptation will be needed if long-term restoration is to be realized.
- Increasing the existing feed-back loop component of Adaptive Management, assessing and acting upon the results.
- Implementing recommendations from the Adaptive Management Workshop. The ERPSB is concerned about the slow rate in which the concepts and practical steps developed at the workshop are being carried out.
- Enhancing efforts to develop conceptual and operation models to aid decision making. These should include a set of nested models, including an integrated regional model and location and issue specific models that are consistent with this larger model.
- Continuing the work in critically analyzing and articulating the scientific rationales for ERP Milestones.
- Completing a comprehensive review of ERP funded projects (Phase 3 of the Projects Evaluation).
- Updating and refining the ERP Strategic Plan to provide timely guidance for the ERP.
- Developing and adopting a set of performance indicators.

The ERP Agencies and Science Programs will consider the ERPSB's recommendations in planning staff and project actions. Members of the ERPSB anticipate continued collaboration with both the ERP Agencies and Science Program staff in assisting those programs in their respective efforts at using science to help direct program actions.

Another issue of concern, but not called out by the ERPSB as a specific recommendation is the "closing of the adaptive management loop." In the adaptive management model described in the Strategic Plan for Ecosystem Restoration and adopted in the ROD, information from activities would feedback into the decision making chain and allow for modified approaches as new information is developed. This feedback loop requires monitoring and reporting on a timely basis. Among the factors limiting the feedback loop is adequate funding and contracting ability.

One example of closing the adaptive management feedback loop is the mercury annual review. Working with the mercury coordinator, an annual review workshop will convene all of the mercury researchers and restoration managers with a scientific review. The annual workshop will be a forum to summarize current knowledge about mercury management and make recommendations to adjust activities.

The ERP has funded several projects that assist farmers in integrating agricultural activities with ecosystem restoration. In carrying our proposed activities regarding this topic ERP will work with the ERP Science Board to better address how such activities contribute toward milestones and how habitat enhancements on working farms and ranches fit into a conserved habitat mosaic. Among the planned actions that will incorporate science review include developing a framework for agricultural activities benefiting wildlife and fish and analyzing the effects of previous ERP-funded agricultural projects benefiting wildlife and fish.

Environmental Justice and Tribal Relations:

Environmental Justice and tribal relations are important implementation commitments of the Bay-Delta Program, and are important components of the ERP. The ERP maintains an extensive list of local agencies, tribes, and nonprofit organizations, including many representing economically disadvantaged communities, to whom it provides notices about the ERP's activities and proposal solicitation packages. The ERP holds workshops to explain grant-making guidelines, criteria and processes in communities in its solution area and provides assistance to grant seekers through a toll-free telephone number and on-line materials. Local agencies and tribes are notified when the ERP Agencies receive proposals within their jurisdictions so they are aware and can provide comments if they choose to do so. Their comments are considered in grant recommendations.

Two activities illustrate how ERP Agencies integrate environmental justice concerns and tribal relations: the ERP funded studies involving fish consumption and the Environmental Water Program.

Since 2000, the ERP has provided financial support for public health agencies to provide outreach and education for disadvantaged and at-risk communities for fish contamination. DHS is engaging communities and stakeholders in developing educational materials and methods of educating people in the Bay Region and Central Valley. DHS' efforts are focused on using existing networks to develop and disseminate the information about the risks of eating contaminated fish; existing networks include community-based organizations, county environmental health departments, food stamp programs and health care providers. With involvement by these stakeholders, educational materials were developed in several languages and at different literacy levels and are available to any interested groups or individuals.

DHS is using an ERP grant to provide mini-grants to several community-based organizations for specialized outreach to specific at-risk groups. A local stakeholder group meets regularly to collaborate and develop educational materials. These educational materials also emphasize the benefits of eating fish and provide information about the types of fish that can be eaten safely. A fish monitoring project, recently funded by ERP, also is developing advisories, outreach and educational efforts. This project involves a diverse stakeholder and agency steering committee to provide input and assist with outreach efforts and integrates environmental justice principles into the project.

Among the other issues that the ERP Agencies and the BDPAC Environmental Justice Subcommittee will work to address is that of identifying potential third party impacts from environmental restoration activities. For example, the ERP will continue to involve BDPAC Environmental Justice Subcommittee and other community

based organizations in the fish contamination monitoring and outreach and education activities. Recent activities include funds to support a local stakeholder advisory group to develop outreach materials and strategy, community-based organizations and tribal involvement in the steering committee for the fish tissue monitoring project, and a DHS project that provides mini-grants to local community organizations to do outreach on the fish contamination issue.

The ERP Agencies also will work with the CBDA Tribal Relations Coordinator to help foster more meaningful tribal input and participation on issues or concerns of the tribes. Among the opportunities to do so are:

- Tribal Water Programs (Clean Water Act 106, 319H, etc.) The majority of California Tribes developed USEPA Tribal Environmental Programs with extensive water protection and water quality programs that should be considered in ecosystem restoration project planning and implementation.
- Tribal MOUs/Programmatic Agreements (PAs). Memorandums of Understanding (MOUs), Memorandums of Agreement (MOAs) and Programmatic Agreements (PAs) with California Tribes are an effective method of conducting initial consultation and final decision-making in implementing the ERP.
- Stewardship. Tribes are very aware of stewardship concepts and have formed partnerships with many local agencies and environmental groups to promote such concepts and on-the-ground projects. The ERP may be able to assist in its capacity-building function in helping to continue existing connections and foster new relationships between Tribes and other stakeholder groups to meet mutual environmental restoration needs.
- Bay-Delta Public Advisory Committee (BDPAC) Tribal Representatives. California Tribes have been involved with the CALFED Bay-Delta Program for several years in various stakeholder groups and other public forums. There currently are two Tribal Advisory Members serving on BDPAC and several of its subcommittees, including the Ecosystem Restoration Subcommittee. CBDA's Tribal Coordinator, along with the ERP Agencies, can assist in relaying information about ERP implementation between BDPAC, its subcommittees and the California Tribes.
- Role of the Bureau of Indian Affairs (BIA). Although the BIA is not a CALFED member agency, it is the lead federal agency for protecting Indian Trust Assets (ITAs). The BIA reviews environmental compliance documents of CALFED projects impacting ITA's.
- Grant opportunities/educational outreach. The ERP Agencies will work with the CBDA Tribal Coordinator to continue to notify tribal governments of grant opportunities that promote ecosystem restoration.

The ERP Agencies and the CBDA Tribal Coordinator will continue to work together to explore other opportunities to enhance tribal relations and outreach to tribes regarding ecosystem restoration and related issues.

Cross-Program Relationships

Environmental Water Account (EWA) – Ensuring that the short- and long-term water management efforts of the projects protect the ecosystem or are consistent with or complementary of the ERP is a key linkage that will be the responsibility of DFG, NMFS, and the USFWS.

ERP integration with the EWA is on the critical path for Delta Improvement Package Actions and Schedules. The ERP and the EWA share a common biological goal of protecting and enhancing at-risk fish species. Although the ERP and EWA are designed to reach these goals through different mechanisms (habitat creation and management in the case of the ERP versus flow manipulation in the case of the EWA), the two programs can increase their biological effectiveness by coordinating their activities. A 2001 briefing paper for the EWP listed a number of important means by which the EWA and the EWP could work together in acquiring and using water resources. A great deal of valuable coordination has already taken place. The managers of the various programs meet with each other and discuss opportunities for coordination. The CALFED program often uses (b)(2) and EWA water conjunctively to reduce pumping operations, with the EWA water being used to reduce pumping at the State Water Project while (b)(2) water is used to reduce pumping at the Central Valley Project. The management agencies also have looked for ways of using EWA water to simultaneously reduce take at the pumps and achieve other fishery benefits such as increased flows in upstream areas and decreased water temperatures.

Integration and communication between each of the environmental water programs (EWA, EWP, CVPIA (b)(2), and CVPIA WAP) has increased and the 2004 EWA Review Panel workshop also included for the first time a presentation and discussion of the ERP's EWP and its relationship to the EWA. Increased collaboration between these two environmental water programs is critically important, because the science supporting both programs is inseparable. Although the EWP has yet to exercise its own authorized water purchase element, future implementation should further unite and expand the coordination of these two programs.

EWA Implementing Agencies are CDWR, USBR, USFWS, NMFS, and DFG. USFWS, NMFS, and DFG are also ERP Agencies.

Storage, Conveyance, and Conjunctive Use – Ensuring that the short- and long-term water management efforts of these projects protect the ecosystem or are consistent with or complementary of the ERP is a key linkage that will be the responsibility of DFG, NMFS, and the USFWS, in collaboration with DWR and USBR.

Many planned Conveyance Program actions could have ecosystem impacts that will be addressed in project-specific environmental documents. Planned Conveyance Program actions being evaluated include constructing a new screened intake at Clifton Court Forebay, increasing SWP pumping, constructing operable barriers on the south Delta, revising Delta Cross Channel (DCC) operation, and implementing restoration efforts as part of the North Delta Flood Control and Ecosystem Restoration Improvement Program. ERP involvement in the North Delta Flood Control and Ecosystem Restoration Improvement Program planning efforts includes ongoing participation on the North Delta Agency Team, North Delta Improvement Group, and recently increased communication among ERP agency scientists and North Delta Program staff.

ERP integration with the Storage, Conveyance and Conjunctive Use programs is on the critical path for Delta Improvement Package Actions and Schedules for OCAP ESA and SDIP ESA consultations.

The ERP Agencies engage in the Storage program through their regulatory processes, participating on technical panels, assisting in the collection of biological data at proposed storage projects, support of environmental documentation preparation, and in their efforts to develop and share science supporting Storage Program decisions.

Water Transfer – The EWA, ERP, and EWP are all interconnected by the shared goal of recovering at-risk fish species. There are undeveloped opportunities for cross-program linkages between ERP and the Water Transfer Program. To develop cross-program linkages, the EWP developed a process for selecting pilot water acquisitions that includes a related program coordination plan (potential EWP projects will be evaluated by staff from all programs that seek to acquire or transfer water). The ERP proposes the development and implementation of conservation strategies for water dependent wildlife such as the listed giant garter snake. These activities support ongoing water transfer and EWA activities.

Drinking Water Quality (DWQ) – The ERP has worked closely with the DWQ Program in developing information and selecting projects to address water quality issues that impact both ecosystem and human health. For example, ERP coordinates its San Joaquin Salinity and Selenium Reduction activities with DWQ. To date, the ERP has invested over $44 million in water quality projects, many of which have drinking and environmental water quality benefits. In addition, ERP investments in other areas, such as watershed protection and restoration of riparian buffer zones are likely to reduce run-off from urban and agricultural sources and therefore improve drinking water quality. An example of an ERP project that meets both ERP and DWQ goals is the San Joaquin River Real-time Water Quality Management Program.

The ERP provided $1.2 million to DWR for the *Feasibility Study of Ecosystem and Water Quality Benefits Associated with Restoration of Franks Tract, Big Break, and Lower Sherman Lake* through the 2001 PSP. Franks Tract restoration originally was considered an ERP project; however, initial studies and modeling suggested that proposed actions could have greater water quality benefits and warranted additional study. This study will be completed in June 2005. The Franks Tract project now is considered part of the Drinking Water Quality Program (DWQP) because one of the project's goals is to improve water project operations while reducing salinity levels in the South Delta and at the Contra Cost Water District intakes and the water projects export facilities. The DWQP is working closely with DWR to fully understand the potential of this project, to implement pilot tests, and to ensure that water quality gains are maintained through appropriate changes in the Water Quality Control Plan or project operations agreements.

In cases where ERP investments may adversely affect drinking water quality, the ERP has invested in research and monitoring to better understand potential effects. The ERP has invested over $10 million in six different research projects that investigate the potential impacts to drinking water from wetland restoration and organic carbon as a food resource for the aquatic ecosystem.

A lot of overlap on water quality issues and both program have funded projects that benefit overall water quality for both programs, including projects that research sources and cycling or organic carbon, projects to investigate and implement methods to improve water quality from agricultural and urban runoff.

Water Use Efficiency (WUE) – Improvements in water use efficiency have the potential to benefit aquatic habitats, through improvements in both the quality and quantity of instream flows. The water use efficiency investments take place at the local level, and to that end, the ERP Agencies' regional coordinators play a significant role in the ERP-Water Use Efficiency Program linkage.

Watershed – Prior to the Watershed Program developing its ability to provide funding, the ERP funded capacity building for local watershed groups. Now that the Watershed Program funds such capacity building, the ERP has focused on funding restoration projects developed in support of local watershed plans. Complementary efforts in numerous watersheds have been funded by both programs through close collaboration during project selection processes. Two ERP Implementing Agencies (DFG and USFWS) are also implementing agencies for the Watershed Program.

The ERP established the EWP to acquire water on upstream tributaries to the Bay-Delta system to improve spawning and rearing habitat for salmonids and to implement ERP flow-related objectives on these tributaries. EWP water acquisitions will use communication networks established by prior ERP and continuing Watershed efforts.

Most projects funded by the Watershed Program have water quality benefits for the ecosystem, including projects that directly improve water quality by controlling sources of pollution in the watershed, and projects that indirectly benefit water quality through assessment, planning, local involvement, outreach and education and improving watershed stewardship throughout the watershed.

Levee System Integrity – The ERP has invested more than $85 million in at least 31 projects related to the Levee System Integrity Program, including projects that specifically address levee system integrity and others that help the Levee program meet its habitat enhancement requirements for levee maintenance. An example of an ERP project that meets both ERP and Levee System Integrity needs is a *Feasibility Study of the Ecosystem and Water Quality Benefits Associated with Restoration of Franks Tract, Big Break, and Lower Sherman Lake*. A wildlife-friendly levee habitat restoration and management project on McCormack-Williamson Tract also contributes to improved levee system integrity.

Funding

Ecosystem Restoration ($ in millions)	Yr 6	Yr 7	Yr 8	Yr 9	Grand Total
State [1]	$119.0	$ 33.8	$ 0.1	$ 0.1	**$ 152.9**
Federal [2]	$ 21.7				**$ 21.7**
Water User [3]	$ 24.5	$ 4.0	$ 4.0	$ 4.0	**$ 36.5**
Available Funding Total	**$165.2**	**$ 37.8**	**$ 4.1**	**$ 4.1**	**$ 211.1**

1. State funds include $13.9 million from the final enacted budget in Year 6 (FY 05-06) for the California Bay-Delta Authority (Authority), Department of Water Resources (DWR), and the Department of Fish and Game (DFG), Resources Agency (RA) and the Wildlife Conservation Board (WCB) and available funding from prior years of $105.1 million. The State budget includes the $13.9 million described here as State funding and the State Water Project Water User Funding amount of $4.4 million for a total of $ 18.3 million.

2. Federal funds are the President's Budget for the US Army Corps of Engineers (USACE), US Fish and Wildlife Service (USFW), and the National Marine Fisheries Service (NMFS). Federal appropriations beyond Year 6 are unknown.

3. Water user funding includes State Water Project funds and CVPIA Restoration funds that are collected from state water contractors and Central Valley Water Project water users, but are budgeted and appropriated through the federal and state governments.

Appendix A: ERP Strategic Goals and Objectives

CALFED Ecosystem Restoration Strategic Goals and Objectives
Goal 1: Endangered and Other At-risk Species and Native Biotic Communities 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.
Objective 1: Achieve, first, recovery and then large self-sustaining populations of the following at-risk native species dependent on the Delta, Suisun Bay, and Suisun Marsh: Central Valley winter-, spring- and fall/late fall-run Chinook salmon ESUs, Central Valley steelhead ESU, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, valley elderberry longhorn beetle, Suisun ornate shrew, Suisun song sparrow, soft bird's-beak, Suisun thistle, Mason's lilaeopsis, San Pablo song sparrow, Lange's metalmark butterfly, Antioch Dunes evening primrose, Contra Costa wallflower, and Suisun Marsh aster.
Objective 2: Contribute to the recovery of the following at-risk native species in the Bay-Delta estuary and its watershed: Sacramento perch, delta green ground beetle, giant garter snake, salt marsh harvest mouse, riparian brush rabbit, San Pablo California vole, San Joaquin Valley woodrat, least bell's vireo, California clapper rail, California black rail, little willow flycatcher, bank swallow, western yellow-billed cuckoo, greater sandhill crane, Swainson's hawk, California yellow warbler, salt marsh common yellowthroat, Crampton's tuctoria, Northern California black walnut, delta tule pea, delta mudwort, bristly sedge, delta coyote thistle, alkali milkvetch, and Point Reyes bird's beak.
Objective 3: Enhance and/or conserve native biotic communities in the Bay-Delta estuary and its watershed, including the abundance and distribution of the following biotic assemblages and communities: native resident estuarine and freshwater fish assemblages, anadromous lampreys, neotropical migratory birds, wading birds, shore birds, waterfowl, native anuran amphibians, estuarine plankton assemblages, estuarine and freshwater marsh plant communities, riparian plant communities, seasonal wetland plant communities, vernal pool communities, aquatic plant communities, and terrestrial biotic assemblages associated with aquatic and wetland habitats.
Objective 4: Maintain the abundance and distribution of the following species: hardhead, western least bittern, California tiger salamander, western spadefoot toad, California red-legged frog, western pond turtle, California freshwater shrimp, recurved larkspur, mad-dog skullcap, rose-mallow, eel-grass pondweed, Colusa grass, Boggs Lake hedge-hyssop, Contra Cost goldfields, Green's legenere, heartscale, and other species designated "maintain" in the Multi-Species Conservation Strategy.

Goal 2: Ecological Processes

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.

Objective 1: Establish and maintain hydrologic and hydrodynamic regimes for the Bay and Delta that support the recovery and restoration of native species and biotic communities support the restoration and maintenance of functional natural habitats, and maintain harvested species.

Objective 2: Increase estuarine productivity and rehabilitate estuarine food web processes to support the recovery and restoration of native estuarine species and biotic communities.

Objective 3: Rehabilitate natural processes to create and maintain complex channel morphology, in-channel islands, and shallow water habitat in the Delta and Suisun Marsh.

Objective 4: Create and/or maintain flow and temperature regimes in rivers that support the recovery and restoration of native aquatic species.

Objective 5: Establish hydrologic regimes in streams, including sufficient flow timing, magnitude, duration, and high flow frequency, to maintain channel and sediment conditions supporting the recovery and restoration of native species and riparian species and biotic communities.

Objective 6: Reestablish floodplain inundation and channel-floodplain connectivity of sufficient frequency, timing, duration, and magnitude to support the restoration and maintenance of functional natural floodplain, riparian, and riverine habitats.

Objective 7: Restore coarse sediment supplies to sediment-starved rivers downstream of reservoirs to support the restoration and maintenance of functional natural riverine habitats.

Objective 8: Increase the extent of freely meandering reaches and other pre-1850 river channel forms to support the restoration and maintenance of functional natural riverine, riparian and floodplain habitats.

Goal 3: Harvested Species

Maintain and/or enhance populations of selected species for sustainable commercial and recreational harvest, consistent with the other ERP strategic goals.

Objective 1: Enhance fisheries for salmonids, white sturgeon, pacific herring, and native cyprinid fishes.

Objective 2: Maintain, to the extent consistent with ERP goals, fisheries for striped bass, American shad, signal crayfish, grass shrimp, and nonnative warm water game fishes.

Objective 3: Enhance, to the extent consistent with ERP goals, populations of waterfowl and upland game for harvest by hunting and for non-consumptive recreation.

Objective 4: Ensure that Chinook salmon, steelhead, trout, and striped bass hatchery, rearing, and planting programs do not have detrimental effects on wild populations of native fish species and ERP action.

Goal 4: Habitats

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.

Objective 1: Restore large expanses of all major habitat types, and sufficient connectivity among habitats, in the Delta, Suisun Bay, Suisun Marsh, and San Francisco Bay to support recovery and restoration of native species and biotic communities and rehabilitation of ecological processes. These habitat types include tidal marsh (fresh, brackish, and saline), tidal perennial aquatic (including shallow water and tide flats), nontidal perennial aquatic, tidal sloughs, midchannel island and shoal, seasonal wetlands, riparian and shaded riverine aquatic, inland dune scrub, upland scrub, and perennial grasslands.

Objective 2: Restore large expanses of all major aquatic, wetland, and riparian habitats, and sufficient connectivity among habitats, in the Central Valley and its rivers to support recovery and restoration of native species and biotic communities and rehabilitation of ecological processes. These habitat types include riparian and shaded riverine aquatic, instream, fresh emergent wetlands, seasonal wetlands, other floodplain habitats, lacustrine, and other freshwater fish habitats.

Objective 3: Protect tracts of existing high quality major aquatic, wetland, and riparian habitat types, and sufficient connectivity among habitats, in the Bay-Delta estuary and its watershed to support recovery and restoration of native species and biotic communities, rehabilitation of ecological processes, and public value functions.

Objective 4: Minimize the conversion of agricultural land to urban and suburban uses and maintain open space buffers in areas adjacent to existing and future restored aquatic, riparian, and wetland habitats, and manage agricultural lands in ways that are favorable to birds and other wildlife.

Objective 5: Manage the Yolo and Sutter bypasses as major areas of seasonal shallow water habitat to enhance native fish and wildlife, consistent with CALFED Program objectives and solution principles.

Goal 5: Nonnative Invasive Species

Prevent the establishment of additional nonnative invasive species and reduce the negative ecological and economic impacts of established nonnative species in the Bay-Delta estuary and its watershed.

Objective 1: Eliminate further introductions of new species from the ballast water of ships into the Bay-Delta estuary.

Objective 2: Eliminate further introductions of new species from imported marine and freshwater baits into the Bay-Delta estuary and its watershed.

Objective 3: Halt the unauthorized introduction and spread of potentially harmful nonnative introduced species of fish or other aquatic organisms in the Bay-Delta and Central Valley.

Objective 4: Halt the release of nonnative introduced fish and other aquatic organisms from private aquaculture operations and the aquarium and pet trades into the Bay-Delta estuary, its watershed, and other California waters.

Objective 5: Halt the introduction of nonnative invasive aquatic and terrestrial plants into the Bay-Delta estuary, its watershed, and other central California waters.

Objective 6: Reduce the impact of nonnative mammals on native birds, mammals, and other organisms.
Objective 7: Limit the spread or, when possible and appropriate, eradicate populations of nonnative invasive species through focused management efforts.
Objective 8: Prevent the invasion of the zebra mussel into California.
Goal 6: Water and Sediment Quality 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.
Objective 1: Reduce the loadings and concentrations of toxic contaminants in all aquatic environments in the bay-Delta estuary and watershed to levels that do not adversely affect aquatic organisms, wildlife, and human health.
Objective 2: Reduce loadings of oxygen-depleting substances from human activities into aquatic ecosystems in the Bay-Delta estuary and watershed to levels that do not cause adverse ecological effects.
Objective 3: Reduce fine sediment loadings from human activities into rivers and streams to levels that do not cause adverse ecological effects.

The programmatic biological opinions and the NCCPA approval found in the appendices of the ROD contained a set of 119 "milestones." The milestones are a discrete set of actions intended to be carried out during the CALFED Program's Stage 1 (the first 7 years of the 30-year program). These actions are derived from the PEIS/R technical appendices including the MSCS and program plans for the ERP and Water Quality Program. USFWS, NMFS, and DFG developed the milestones to ensure that the MSCS, ERP and Water Quality Program are carried out in a manner and level adequate to sustain programmatic ESA, NCCPA, and CESA compliance for all CALFED Program elements.

The milestone numbers only indicate the order in which they appear in the ROD and do not represent any sort of priority of the milestone.

Delta Region

Delta Region Ecological Processes

Milestone 1. 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.

Milestone 2. 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.

Milestone 3. Provide a fall or early winter outflow that emulates the first "winter" rain through the Delta.

Milestone 4. 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.

Milestone 5. 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 the Eastside Delta Tributary EMZ.

Delta Region Habitats

Milestone 6. In the Sacramento-San Joaquin Delta EMZ, cooperatively enhance at least 15 percent of the ERP target for wildlife friendly agricultural practices.

Milestone 7. 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.

Milestone 8. 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 EMUs, respectively. Establish at least one population of bristly sedge in each EMU.

Milestone 9. 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 EMUs, respectively.

Milestone 10. 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.

Milestone 11. Restore a minimum of 125 acres of channel islands and 125 acres of shoals in the Delta.

Milestone 12. 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.

Milestone 13. Implement 25 percent of the ERP target for diverse, self-sustaining riparian community for each EMU in the Sacramento-San Joaquin Delta EMZ.

Milestone 14. 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.

Milestone 15. Enhance, protect and restore 1,000 to 1,500 acres of seasonal wetlands in the East Delta EMU for optimum greater sandhill crane habitat.

Milestone 16. Restore a minimum of 500, 250, 500, and 750 acres of tidal perennial aquatic habitat in the North, East, South, and Central and West Delta EMUs, respectively.

Delta Region Stressor Reduction

Milestone 17. 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.

Milestone 18. Provide unimpeded upstream and downstream passage for salmon and steelhead on Eastside Delta tributaries.

Milestone 19. Assist in the development and implementation of a black and clapper rail impact reduction program.

Milestone 20. Develop and begin implementation of a program to reduce or eliminate the influx of non-native aquatic species in ship ballast water.

Milestone 21. Complete installation of fish passage facilities at Bellota Weir, Clements Dam, and Cherryland Dam on the Calaveras River and provide passage flows.

Milestone 22. Develop and begin implementation of a demonstration program to reduce invasive non-native plant abundance within at least one EMU in the Delta.

Milestone 23. 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.

Milestone 24. Consolidate and screen 50 small agricultural diversions in the Delta, prioritized according to size, location, and season of operation.

Milestone 25. Upgrade screens at Southern Energy's Contra Costa power plants with screens acceptable to the Fish and Wildlife Agencies.

Milestone 26. 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 maximum 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.

Milestone 27. Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations (from Phase II Report).

Milestone 28. Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers (from Phase II Report).

Milestone 29. 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 U.S. Department of Agriculture (USDA) sediment reduction program.
- Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban storm water runoff, and other specific sites.
- Implement stream restoration and revegetation work.
- Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.

Milestone 30. 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.

Milestone 31. 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

Milestone 32. 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.

Milestone 33. 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.

Milestone 34. 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).

Milestone 35. 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 storm water runoff and discharges to reduce PCB and organochlorine pesticides.

Milestone 36. 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 storm water control facilities.
- Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.

Milestone 37. Conduct the following unknown toxicity work (from Phase II Report):

- Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.

Suisun Marsh and North San Francisco Bay Region (Bay Region)

Bay Region Habitats

Milestone 38. 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 (EMUs) of the Suisun Marsh/North San Francisco Bay Ecological Management Zone.

Milestone 39. In the Suisun Marsh/North San Francisco Bay Ecological Management Zone (EMZ), restore a minimum of 7,000 acres of Saline Emergent Wetland by restoring tidal action in the Suisun Bay and Marsh EMU (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 EMUs. 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.

Milestone 40. 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 EMU. Bring at least 25 percent the currently existing but unprotected occurrences of delta mudwort and delta tule pea into protection through purchase or conservation agreement, and ensure appropriate management.

Milestone 41. In the Suisun Marsh/North San Francisco Bay EMZ, 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.

Milestone 42. Restore a minimum of 400 acres of tidal perennial aquatic habitat in the Suisun Marsh/North San Francisco Bay EMZ.

Milestone 43. 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 percent of currently unprotected, existing populations into protection through purchase or conservation agreement, and ensure appropriate management.

Bay Region Stressors Reduction

Milestone 44. Develop a program to consolidate, screen, or eliminate 25 percent of the unscreened diversions in Suisun Marsh.

Milestone 45. Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report).

Milestone 46. Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report).

Milestone 47. Actions to reduce fine sediment loading to streams, especially the … 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 storm water runoff, and other specific sites.
- Implement stream restoration and revegetation work.
- Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.

Milestone 48. 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.

Milestone 49. 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

Milestone 50. 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).

Milestone 51. 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 storm water runoff and discharges to reduce PCB and organochlorine pesticides.

Milestone 52. 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 storm water control facilities.
- Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.

Milestone 53. Conduct the following unknown toxicity work (from Phase II Report):

- Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.

Sacramento River Basin Region (Sacramento Region)
Sacramento Region Ecological Processes

Milestone 54. Construct a network of channels totaling 20 miles within the Sutter and Yolo Bypasses that effectively drains flooded lands after flood flows 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.

Milestone 55. 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.

Milestone 56. 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.

Milestone 57. 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.

Milestone 58. 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.

Milestone 59. 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 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.

Milestone 60. 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 three and five habitat preserves for bank swallows along the upper reaches of the Sacramento River capable of supporting 5,000 bank swallow burrows between the towns of Colusa and Red Bluff.

Sacramento Region Habitats

Milestone 61. In the American River Basin, Butte Basin, Colusa Basin, Feather River/Sutter Basin EMZs, cooperatively enhance at least 15 to 25 percent of the ERPP target for wildlife friendly agricultural practices.

Milestone 62. 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.

Milestone 63. 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.

Milestone 64. 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.

Milestone 65. 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.

Sacramento Region Stressors Reduction

Milestone 66. 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.

Milestone 67. Provide unimpeded upstream and downstream passage for salmon and steelhead on Sacramento River Basin tributaries.

Milestone 68. 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.

Milestone 69. Develop and implement a solution to improve passage of upstream migrant adult fish and downstream migrant juvenile fish Battle Creek.

Milestone 70. 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.

Milestone 71. 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.

Milestone 72. Install positive barrier fish screens on all diversions greater than 250 cfs in all EMZs and 25 percent 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.

Milestone 73. Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report).

Milestone 74. 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.

Milestone 75. Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report).

Milestone 76. 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 storm water runoff, and other specific sites.
- Implement stream restoration and revegetation work.
- Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.

Milestone 77. 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.

Milestone 78. 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.

Milestone 79. 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.

Milestone 80. 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.

Milestone 81. 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 storm water runoff and discharges to reduce PCB and organochlorine pesticides.

Milestone 82. 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 storm water control facilities.
- Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.

Milestone 83. Conduct the following unknown toxicity work (from Phase II Report):

- Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.

San Joaquin River Basin Region (San Joaquin Region)

San Joaquin Region Ecological Processes

Milestone 84. 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.

Milestone 85. 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.

Milestone 86. 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.

Milestone 87. 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.

Milestone 88. 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-channel 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.

Milestone 89. 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.

Milestone 90. Establish a river meander corridor between the Chowchilla Bypass and Mendota Pool to expand the floodway corridor to convey increased anticipated flood flows and restore floodplain habitat.

San Joaquin Region Habitats

Milestone 91. In the San Joaquin River and West San Joaquin Basin EMZs, cooperatively enhance at least 15 to 25 percent of the ERPP target for wildlife friendly agricultural practices.

Milestone 92. In the West San Joaquin Basin EMZ, restoring or create 100 acres of fresh emergent wetland habitat.

Milestone 93. 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.

Milestone 94. 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.

Milestone 95. 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 percent and the number of populations and individuals by at least 10 percent 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.

San Joaquin Region Stressors Reduction

Milestone 96. 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.

Milestone 97. Provide unimpeded upstream and downstream passage for salmon and steelhead on San Joaquin River Basin tributaries.

Milestone 98. 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.

Milestone 99. Install positive barrier fish screens on all diversions greater than 250 cfs in all EMZs and 25 percent 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.

Milestone 100. 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 maximum 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.

Milestone 101. Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations (from Phase II Report).

Milestone 102. 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 BMPs, including reducing anthropogenic fine sediment loads, to minimize or eliminate inter-substrate low DO conditions.

Milestone 103. 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).

Milestone 104. Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers (from Phase II Report).

Milestone 105. 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 storm water runoff, and other specific sites.
- Implement stream restoration and revegetation work.
- Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.

Milestone 106. 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.

Milestone 107. 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.

Milestone 108. 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).

Milestone 109. 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 storm water runoff and discharges to reduce PCB and organochlorine pesticides.

Milestone 110. 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 storm water control facilities.
- Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.

Milestone 111. Conduct the following unknown toxicity work (from Phase II Report):

- Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.

Research Milestones

Milestone 112. 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.

Milestone 113. 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.

Milestone 114. Conduct a study to investigate the effects of the road through Olcott Lake on vernal pool hydrology and impacts on vernal pool species.

Milestone 115. Conduct instream flow studies to determine the flows necessary to support all life stages of anadromous and estuarine fish species.

Milestone 116. 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.

Milestone 117. Conduct experimental introductions of Sacramento perch into nontidal perennial aquatic habitats.

Milestone 118. 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.

Milestone 119. 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.