California Department of Fish & Wildlife
National Oceanic & Atmospheric Administration
US Fish & Wildlife Service

Ecosystem Restoration Program Plan and Annual Report Year 14

(State FY 2013-14)

June 30, 2013

Ecosystem Restoration Program

Introduction

The Sacramento-San Joaquin Delta (Delta) is the largest wetland ecosystem on the Pacific Coast of the United States. It lies at the center of the Bay-Delta ecosystem, which comprises the upper extent of the San Francisco Estuary and connects two-thirds of California via the watersheds that feed into it. The Delta is home to more than half a million people, contains 500,000 acres of agriculture, provides drinking water for more than 25 million Californians, and serves as habitat for a diverse assortment of plant and animal species. Yet this vital ecological and economic link for California and the world has been altered to the extent that it no longer effectively supports all of its needed ecological functions. Approximately 3% of the Delta's historical 450,000 acres of tidal wetlands remain today. The State's increasing population and demand for water combined with changing environmental conditions are further degrading what remains of the Bay-Delta ecosystem and threatening the very existence of species that depend on it. The Ecosystem Restoration Program (ERP) is a multi-agency effort aimed at improving and increasing aquatic and terrestrial habitats and ecological functions in the Delta and its tributaries.

The ERP Focus Area includes the Delta, Suisun Bay, the Sacramento River below Shasta Dam, the San Joaquin River below the confluence with the Merced River, and other major tributary watersheds directly connected to the Bay–Delta ecosystem below major dams and reservoirs (Figure 1). Principle participants overseeing the ERP are the California Department of Fish and Wildlife (CDFW), the United States Fish and Wildlife Service (USFWS), and NOAA's National Marine Fisheries Service (NMFS), collectively known as the ERP Implementing Agencies.

The ERP goals delineate the objectives for the future condition of the ERP Focus Area. Ecosystem restoration goals help develop and organize the numerous components of the ERP. The following are the six strategic goals that guide the ERP:

1. Recover endangered and other at-risk species and native biotic communities;
2. Rehabilitate ecological processes;
3. Maintain or enhance harvested species populations;
4. Protect and restore habitats;
5. Prevent the establishment of and reduce impacts from non-native invasive species; and
6. Improve or maintain water and sediment quality.

This document, the Ecosystem Restoration Program Plan and Annual Report, FY 14 (), describes the progress made toward achieving these six strategic goals. It summarizes the activities accomplished by the ERP during the previous State fiscal year, Year 13, while identifying priority activities for the current fiscal year, Year 14, including activities completed by CDFW ERP staff.

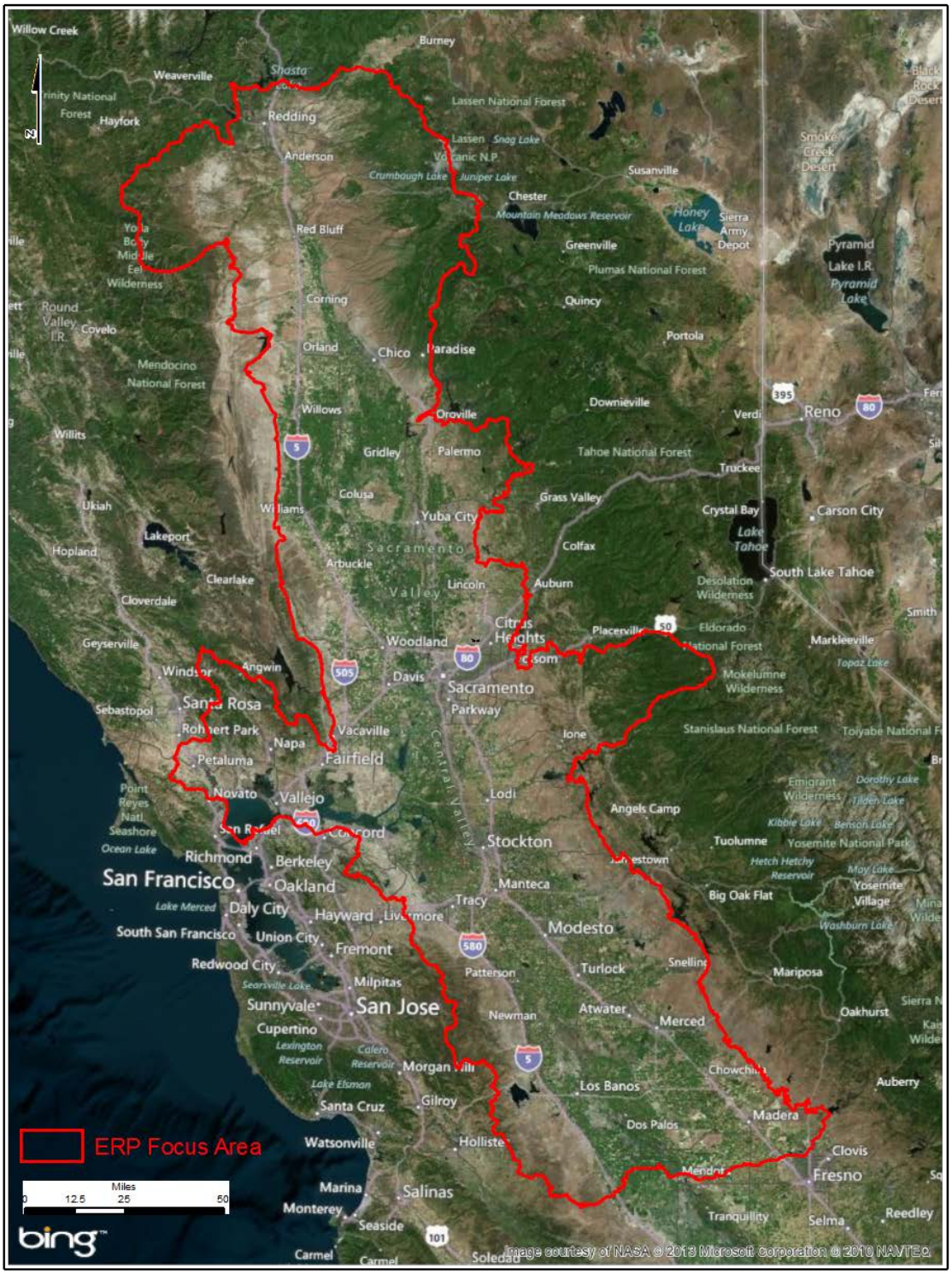

Figure 1. ERP Focus Area.

ERP Funding

Funding for the ERP has come from both State and federal sources. In addition, ERP funding has been used to match other sources of funding to complete priority projects.

State Funding
The primary sources of State funding for ERP projects include the following:

- Proposition 204–Safe, Clean, Reliable Water Supply Act (1996)
- Proposition 13–Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act (2000)
- Proposition 50–Water Quality, Supply and Safe Drinking Water Projects Act (2002)
- Proposition 84–Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act (2006)

For Year 14, ERP is requesting $31 million of State funds for program implementation (a combination of newly encumbered funds and reappropriated funds from previous years) to fund ongoing ERP project activities during State fiscal year 2013-2014. A portion of this funding will support staff that will manage approximately 70 projects expected to be active during Year 14, as well as fund staff participating in various administrative, planning and monitoring efforts that affect the Delta ecosystem. A majority of the funds will support projects selected by and funded though the ERP Grant Program.

Federal Funding
In addition to the funding that the State provides for the ERP Grant Program and other activities that support Bay-Delta ecosystem restoration, the Federal government provides funding to support various activities that contribute to Bay-Delta ecosystem restoration. Out of the requested Federal Bay–Delta funding for federal fiscal year 2014, approximately $62 million would fund additional ecosystem restoration activities through various agencies, programs, partnerships, operations, and direct habitat restoration projects (Table 1) (USFWS 2013).

Table 1. Federal Year 14 Requests

Anadromous Fish Restoration Program (AFRP)	$10,065,000
Anadromous Fish Screen Program (AFSP)	$5,070,000
CALFED Coordination	$100,000
CALFED Program Management, Oversight, and Coordination	$1,700,000
Clear Creek Restoration	$800,000
Dedicated Project Yield	$600,000
Ecosystem Restoration Program (ERP) Oversight & Coordination	$129,000
Habitat Restoration	$2,937,000
Hamilton City, CA	$15,000,000
Other CVP Impacts	$1,500,000
Renewed Federal State Partnership	$102,000
Screen Engineering and Review	$65,000
Spawning Gravel/Riparian Habitat	$1,200,000
Suisun Marsh Protection	$1,423,000
Water Acquisition	$21,406,000
Total Expenditures	**$62,097,000**

Year 13 Activities

ERP Grant Program

A principle activity of the ERP is to implement projects within the Focus Area through grants administered by the ERP Grants Program. The ERP develops projects through the Proposal Solicitation Process (PSP) and through the Directed Action Process (DA) (http://www.dfg.ca.gov/erp/grants_projects.asp). Proposed projects undergo peer review by outside experts to ensure their technical accuracy and overall quality. The ERP funded Project Review Office located at University of California Davis provides unbiased expert review and assessment of the technical merits of proposals, reports, conceptual models, and other work products. Table 2 provides a summary of projects funded by ERP through Year 13. Most of these projects provide multiple benefits and often contribute to more than one topic area, for tracking purposes they are listed here by the primary topic that they address.

Table 2. Summary Projects Funded by the ERP through Year 13

Topic Area	Number of Projects	Amount Approved
At-Risk Species Assessment	50	$50,626,054
Ecosystem Water and Sediment Quality	67	$79,552,317
Environmental Education	33	$7,051,745
Environmental Water Management	8	$7,925,853
Estuary Foodweb Productivity	4	$2,172,064
Fish Passage	17	$72,813,291
Fish Screens	65	$130,834,064
Harvestable Species Assessment	10	$8,949,094
Hydrodynamics, Sediment Transport, and Flow Regimes	31	$37,871,441
Local Watershed Stewardship	53	$19,013,916
Lowland Floodplains and Bypasses	29	$42,708,766
Mine Remediation	4	$2,177,550
Non-Native Invasive Species	35	$33,761,206
Riparian Habitat	30	$46,742,099
River Channel Restoration	18	$24,683,886
Shallow Water and Marsh Habitat	52	$74,196,042
Upland Habitat and Wildlife Friendly Agriculture	20	$65,321,667
X2 Relationships (Freshwater-Seawater Interface)	1	$509,222
Totals	**527**	**$706,910,277**

Note: Inconsistences with previous year(s) reporting either in number of projects per topic, amount approved, or overall totals can be attributed to changes in project status, such as early cancelation, consolidation of projects, withdrawal of a project before implementation, or a decision to change a project's primary function to one that is a better fit. In addition, technical support, administrative or program support project previously reported are no longer tracked in this table, but are still tracked in the ERP Activities Report as part of overall program delivery.

Grant Management

At the close of Year 13, the ERP managed 69 grant projects, including six projects that initiated work and 10 projects closed during Year 13 (Appendix A). Staff also worked to develop additional grants for Year 14. Appendix B provides a summary of projects that will continue to be active in or will start in Year 14. For specific information about any of the ERP projects, please contact the ERP staff directly (the ERP staff contacts can be found on the ERP website: http://www.dfg.ca.gov/erp/).

ERP Projects Database

The ERP utilizes an Access/SQL Server database to track programmatic and fiscal information pertaining to the ERP grants. CDFW's Information Technology Branch maintains the hardware and software that support the database. ERP staff from CDFW's Water Branch and Regions are responsible for inputting project data and providing updates. The ERP is required to report project information from the ERP Projects Database to update the Delta Stewardship Council on the ERP's progress twice a year (June and December). The ERP Projects Database is also used to update and maintain the Bond Accountability Databases, and project eligibility lists maintained by the Department of Water Resources, Department of Parks and Recreation, Department of Finance, and State Treasurer's Office.

Year 13 Project Highlights

The following are some of the high profile projects that the ERP has completed in Year 13 or are currently active. For information that is more detailed on individual project and program activities, see the Ecosystem Restoration Program Activities Report Year 14 (CDFW 2014).

American Basin Fish Screen and Habitat Improvement Project (Sankey Diversion): In partnership with the CVPIA AFSP, the ERP is providing matching State cost share for the construction phase of Natomas Mutual Water Company's new 434 cfs screened pumping plant (Sankey Diversion) on the Sacramento River. When completed, the new facility will improve fish passage conditions for at-risk species in the Sacramento River by replacing existing unscreened diversions with a consolidated fish screen and intake facility which meets or exceeds federal and State screening criteria. Components of the project include construction of the screened Sankey Diversion, construction of distribution facilities required to deliver water from the Sankey Diversion outfall to existing points of use, the decommissioning, demolition and site restoration of the Northern and Bennett Pumping Plants on the Natomas Cross Canal, and the decommissioning and removal of the Verona Diversion Dam. Construction began in 2010 and is expected to be completed in 2014.

Battle Creek Salmon and Steelhead Restoration Project: The Battle Creek Salmon and Steelhead Restoration Project restores and increases the populations of State and federally listed winter and spring-run Chinook salmon and steelhead in cold-water and high-elevation habitats. This is being accomplished through modification of the Battle Creek Hydroelectric Project facilities and operations, owned and operated by Pacific Gas and Electric. The modifications are occurring in three phases, which includes increasing instream flow releases, removing five diversion dams, constructing fish

ladders and fish screens on three diversion dams, and constructing tailrace connectors to minimize the diversion of water from the North Fork of Battle Creek to the South Fork. Once all three phases have been completed, the project will have restored fish access to approximately 42 miles of habitat in Battle Creek and an additional 6 miles of habitat in its tributaries. Year 13 accomplishments for the Restoration Project included work on the fish screen and ladder construction at the Eagle Canyon and North Battle Creek Feeder diversion dams, as well as the Inskip Powerhouse penstock bypass and tailrace connector, now approximately 99% constructed. Information available: http://www.battle-creek.net/ and http://dfg.ca.gov/ERP/erp_proj_battle_ck.asp.

Conaway Ranch Agricultural Conservation Easement Acquisition: A total of $7.8 million in grant funding was provided by multiple entities for the acquisition of four conservation easements totaling approximately 6,224 acres of Conaway Ranch land in Yolo County by CDFW for the protection of threatened and endangered species and wetland, floodplain and riparian habitat areas. Three of the easements are designated for the protection and recovery of specific species, including Swainson's hawk, giant garter snake and tri-colored black bird. The ERP contributed $4 million during Year 13 to complete the purchase of the fourth conservation easement, which encumbers 4,000 acres and protects existing aquatic and migratory bird habitat by restricting land uses to current wildlife-friendly agricultural practices on the property. All of the easements allow for continuation of agricultural uses, as long as those uses maintain the resource values as described under the conservation easements.

Fall X2 Fish Health Study: This project investigates the health of four fish species occupying the low salinity zone (LSZ) during the critical fall period. This project examines the potential effects of stressors (e.g., contaminants, pathogens/diseases, and poor feeding success) on the "health", (growth, fecundity, histopathology, nutritional status, and other stressors induced impairment) of delta smelt, striped bass, threadfin shad, and American shad collected from three regions in the upper San Francisco Bay Delta Estuary, namely Cache Slough complex, the Sacramento/San Joaquin river confluence, and Suisun Bay. The main contrast to make is the one between fish from the Cache Slough complex and those of the LSZ located in Suisun Bay during fall 2011, but more typically located within the river confluence region. In September and October 2011, X2 was located about 74 km from the Golden Gate during fall, placing the LSZ within Suisun Bay with its increased surface area, more complex bathymetry and tidal mixing resulting in increased turbidity. To assess the role of health on survival of fish through the fall, the grantee is using a "characteristics of survivors" approach in which health measurements of fish from each sampling period can be compared to previous periods to determine the characteristics of fish that survived each period. This approach employs a rigorous and comprehensive examination of multiple stressors and physicochemical factors affecting the growth, reproduction, and general health of fish through the critical fall period.

Identifying habitat characteristics that support native fish in the Delta and Suisun Marsh: The grantee is conducting research to develop a better understanding of how physical habitat, flow, and other factors interact to maintain assemblages of native and non-

native species in an environmental gradient that supports populations of most of the native fishes in the upper estuary. By documenting how native and alien fishes use habitat around Suisun Marsh, Sherman Island, and the Cache Slough complex, insights can be gained and hypotheses tested that aid the recovery of at-risk native species, inform flow and habitat management decisions, and allow for better adaptation to climate change.

Management Tools for Landscape Scale Restoration of Ecological Functions: Better known as the Delta Landscapes project, this project contributes a needed dimension to Delta planning by providing a landscape-scale perspective on restoration opportunities and recommendations that are founded in a sound understanding of ecological functions provided by the Delta prior to substantial human modification. Historical data indicates both how the Delta system tends to function in response to physical processes and the conditions to which native species are adapted. This information is critical to planning for a future Delta that is reconciled to support as much native biodiversity as possible with minimal management effort. This information is also important for establishing landscape units with sufficient scale, diversity, and connectivity along physical gradients to adapt to future changes. Detailed, spatially explicit early 1800s habitat information from the Delta Historical Ecology Study is being examined through a lens of key ecological functions that supported Delta wildlife historically. With a team of experts in ecology and physical process, researchers are interpreting the historical Delta landscapes to define these with quantifiable metrics that represent different suites of functions provided by the different physical settings within the larger Delta. Conceptual models and other planning tools will be developed to demonstrate how the functions and metrics are related. These models can then be applied to the current Delta to identify areas where similar functions might be restored and maintained over time. Landscapes will not necessarily be reestablished in the same places or at the same scale as they were historically, but with similar metrics such that functionality is regained. The approach of drawing key functions and metrics from the historical landscape – and then applying those to contemporary and future conditions through landscape-scale conceptual models – can help maximize the value of contemporary restoration, beginning to reconcile the past with the future.

Real-time Movements of Fish: This project adds the capacity of real-time monitoring of fish movement. It consists of a small-scale pilot array that provides real-time knowledge of fish migration and salmon run-timing, stranding, and fate of rescued individuals in locations in the Delta, bypasses, and upper Sacramento River. This technology is particularly relevant for salmon, steelhead, white and green sturgeon, but is also useful for tracking non-native harvestable species movements such as striped bass and largemouth bass. Placed at bottleneck locations and frequently paired to catch movement directionality, it allows for real-time monitoring of fish on a daily basis. It allows resource managers to make management decisions, respond more quickly to migratory behaviors, avert or limit future stranding incidents, assess the success or failure of rescue operations, and potentially inform water operations. This project will develop a webpage for managers to interface directly with the network. The research team also hopes to integrate the real-time array with a system of water quality

monitoring that will tie fish movements to real-time water quality measurements of temperature, flow, turbidity, dissolved oxygen, etc.

Additional ERP Activities

In addition to administering a grant program, ERP staff engaged in activities that contribute to ERP goals and objectives within the ERP Focus Area and statewide. ERP staff supported planning efforts carried out by State and federal agencies, non-governmental organizations, stakeholders, and local governments. ERP staff contributed to development of conceptual models and monitoring programs, coordinated non-native invasive species issues, and coordinated with other programs that contribute to Delta ecosystem restoration.

Adaptive Management and Performance Measures

The ERP is developing an adaptive management framework, which will be included in the final ERP Conservation Strategy. The ERP is collaborating with other agencies to facilitate a common approach for adaptive management implementation. The Delta Reform Act (Water Code Section 85052) defined adaptive management as "a framework and flexible decision-making process for ongoing knowledge acquisition, monitoring, and evaluation leading to continuous improvements in management planning and implementation of a project to achieve specified objectives." An adaptive management approach provides a structured process that allows for taking action under uncertain conditions based on the best available science, closely monitoring and evaluating outcomes, and re-evaluating and adjusting decisions as more information is learned.

In Year 13, the ERP collaborated with the Delta Stewardship Council (DSC) and Delta Science Program (DSP) to incorporate an adaptive management framework into the ERP Conservation Strategy that is consistent with the approach articulated in the Delta Plan (Delta Stewardship Council 2013). This effort is discussed further in the Coordination section below under the Delta Stewardship Council heading. In addition, ERP staff prepared comments pertaining to the application of adaptive management in support of the State Water Resources Control Board's Comprehensive Review of the Bay-Delta Water Quality Control Plan.

The intent of these comments was to facilitate the development and adoption of an adaptive management approach through the revised Bay-Delta Water Quality Control Plan that is consistent with the ERP Conservation Strategy and the Delta Plan. ERP staff engaged in a similar effort concerning the development of the adaptive management and monitoring program, as well as governance structures, for the Bay Delta Conservation Plan. These represent important components of the ongoing effort to seek opportunities to integrate adaptive management activities across multiple programs (e.g., Delta Plan, Bay-Delta Water Quality Control Plan, Bay Delta Conservation Plan, Ecosystem Restoration Program, and Fish Restoration Program Agreement) in order to more efficiently and effectively implement habitat restoration and water management.

A key component of an adaptive management framework is the identification of measurable outcomes and associated performance measures linked to programmatic objectives via models. Measurable outcomes and accurate and operational performance measures are critical components of the adaptive management process in order to:

- document desired and anticipated outcomes following implementation of specific actions;
- help to define the monitoring required to evaluate the outcomes of those actions; and
- track progress towards achieving stated objectives (Dahm et al. 2009).

In Year 13, the ERP made significant progress towards generating performance measures for ecosystem restoration activities in the Delta, including the following:

- Developing a suite of draft performance measures for floodplain restoration that are included in the ERP Conservation Strategy.
- Coordinated with efforts to generate performance measures for the Delta ecosystem that are underway:
    - the Delta Plan, in coordination with the DSP and DSC
    - the California Estuary Monitoring Workgroup for the My Water Quality web portal

Conceptual Model Development and Action Evaluation Process

Conceptual models represent a critical component of a science-based, transparent adaptive management process. They formalize and apply current scientific understanding, and provide a venue to identify areas of uncertainty, identify possible restoration actions, develop expectations, assess likelihood of success, define monitoring needs, and evaluate tradeoffs associated with different management actions. The previous ERP Adaptive Management Planning Team utilized the Delta Regional Ecosystem Restoration Implementation Plan (DRERIP) to develop an initial suite of life history and ecosystem conceptual models (see http://www.dfg.ca.gov/ERP/conceptual_models.asp), and a scientific evaluation process (http://www.dfg.ca.gov/erp/scientific_evaluation.asp) to assess outcomes of proposed restoration actions in the Delta. The models were developed using a common approach and a robust set of tools so that this process would support consistent application of adaptive management. An early use of the models and evaluation process was to evaluate draft conservation measures for the BDCP. The ERP continues to work with the DSP, and other interested parties, to refine and further develop conceptual models of relevance to resource management in the Delta.

In Year 13, the ERP held a workshop where multiple DRERIP conceptual models were used to inform alternatives for the design of restoration alternatives for Prospect Island. A proceedings document was prepared to record the discussion and document the

process. Additionally, five articles on DRERIP were published in *San Francisco Estuary and Watershed Science*:

- Using conceptual models in ecosystem restoration decision making: an example from the Sacramento-San Joaquin River Delta, California (DiGennaro et al. 2012)
- A conceptual model for floodplains in the Sacramento-San Joaquin Delta (Opperman 2012)
- Juvenile Chinook salmon (*Oncorhynchus tshawytscha*) in and around the San Francisco Estuary (Williams 2012)
- A conceptual model for sedimentation in the Sacramento-San Joaquin Delta (Schoellhamer et al. 2012)
- Selenium (Presser and Luoma 2013)

Contaminants and Water Quality

Ecosystem water quality is an important aspect of the ERP work effort. The ERP works closely with other state agencies to support projects that contribute to improving water quality conditions so a healthy and diverse ecosystem and the multiplicity of human uses of waters, including environmental, agricultural, drinking, industrial, and recreational can be realized. In Year 13, ERP supported ongoing projects that: developed Best Management Practices (BMPs); reduced monomethylmercury (MMHg) concentrations and exports from managed seasonal wetlands; developed an integrated model for assessing dissolved oxygen loads to the Deep Water Ship Channel in the San Joaquin River estuary; developed monitoring tools to assess site-specific reproductive fitness of Delta smelt; and examined the potential effects of stressors (such as chemical contaminants, pathogens, diseases, poor feeding success) on the health of Delta smelt through the use of biomarkers.

Workshops

The ERP convenes two types of workshops: 1) project focused workshops, with the goal of improving project deliverables prior to the end of the funding agreement and 2) public workshops, with the goal of reviewing and synthesizing current scientific information so that it can be used to assist the decision making process. These workshops were facilitated through an agreement with the University of California Davis. These workshops are collaborative efforts that include independent scientists, decision makers, engineers and other specialists from many agencies and stakeholder groups. In Year 13 ERP held two workshops, one that addressed planning for Prospect Island and another that reviewed the adaptive management planning for Coleman National Fish Hatchery (see below for more detail).

Project Specific

Prospect Island Workshop: Restoration of Prospect Island is being planned under the Fish Restoration Program Agreement between the Department of Water Resources (DWR) and CDFW. The goal of this ERP sponsored workshop was to consider 15 alternative restoration designs for Prospect Island and recommend five for further consideration and environmental documentation. An invited expert panel (Evaluation Team) used the DRERIP conceptual models and scientific evaluation process, in

combination with hydrodynamic modeling results, to assess each of the alternatives with respect to desired project outcomes and possible adverse effects. This process provided for critical review of restoration options so that managers could weigh the potential outcomes, geographic and temporal scale, reversibility, and overall opportunity for learning associated with different restoration actions. DWR used the Evaluation Team's recommendations plus other feasibility factors to move eight alternatives and a "no action" alternative forward through additional modeling, refinement, and evaluation. A final report, *DRERIP Evaluation for Prospect Island Restoration Design Alternatives*, summarizing the two-day workshop was prepared and posted on the ERP website (http://www.dfg.ca.gov/erp/scientific_evaluation.asp).

Review of the Coleman National Fish Hatchery Adaptive Management Plan: A peer review of the Coleman National Fish Hatchery Adaptive Management Plan (CNFH-AMP) was held in April 2013. The science panel was comprised of independent, academic, and state experts in the fields of salmonid ecology, population dynamics, and hatchery risk assessment. The principal findings and conclusions regarding the CNFH-AMP as it fits within the larger framework of the BCRP and the BCRP-AMP were separated into two groups: (a) positive features of the CNFH which we believe are worthy of recognition and support, and (b) recommendations for critical improvements in the CNFH that would improve its value as a guide to adaptive management of CNFH operations in the context of the objectives of the BRCP.

Development of Best Management Practices to Reduce Methylmercury Exports and Concentrations from Seasonal Wetlands in the Yolo Wildlife Area: The ERP supports a Science Advisory Panel to provide review and guidance on the Development of best management practices to reduce methyl mercury exports and concentrations from seasonal wetlands in the Yolo Wildlife Area. The Panel met in June 2013 to review the second year of study results and discuss the studies planned for the final year of studies.

Public

*Technical Advisory Committee for the Delta Methylmercury Total Maximum Daily Load***:** The ERP provides support for the Technical Advisory Committee for the Delta Mercury Total Maximum Daily Load (Delta Mercury TMDL). In September 2013, the TAC met with groups developing control studies for the Delta Mercury TMDL to provide early guidance on the proposed projects being developed in response to requirements of the Delta Mercury TMDL. The TAC met again in private session to review the control studies submitted in response to the Delta Mercury TMDL.

Non-Native Invasive Species Program

Under the Non–Native Invasive Species (NIS) Program, the ERP funds one position in CDFW to coordinate activities to prevent the introduction of —and manage the existing—non-native invasive plant and animal species throughout the ERP Focus Area. CDFW works with government and non-government agencies, private and public entities, researchers, educators, and other stakeholder groups to identify and resolve

issues involving invasive species as stressors that affect or may affect native plants, wildlife, and/or habitats. CDFW NIS Program activities include:

- Attending intradepartmental and interagency committee and working group meetings;
- Attending and giving presentations or providing input at public meetings, conferences, and workshops;
- Developing and distributing education and outreach materials to other agencies, entities, and the public;
- Assisting in the preparation of management and response plans, best management practices, and other guidance/informational documents; and
- Managing existing contracts and grants for research, education, outreach, and management activities.

Outreach

The ERP recognizes the importance of sharing information gained and lessons learned in respect to ecosystem restoration, especially in the Delta. To build on the ERP outreach efforts, staff contributed to relevant conferences, symposia, and workshops by assisting in the planning, providing presentations, and presenting posters. Staff managed and updated webpages that provided information on the program, projects, and workshops. Grantees produced peer reviewed journal articles, provided presentations, and created posters that helped disseminate information regarding lessons learned and promoted cooperation and coordination with others striving to improve the Delta ecosystem. The ERP convened public workshops on relevant topics related to ecosystem restoration – including workshops aimed at synthesizing the current state of the science and establishing next steps.

Posters

Ecosystem Restoration Program staff produced scientific posters for the Bay Delta Science Conference 2012 and the Interagency Ecological Program Workshop 2013 including:

- Creating an Adaptive Management Decision-Making Framework to Address Uncertainties in Delta Habitat Restoration: Tidal Marsh Productivity Exports, Aquatic Food Webs, and Delta Smelt (Spautz et al. 2012)
- Adaptive Management of Tidal Marsh Restoration in the Delta: Addressing Uncertainties in Aquatic Food Web Responses (Spautz et al. 2013)
- Using Conceptual Models to Evaluate Delta Restoration Actions (Ballard et al. 2012)
- Evaluation Process for Restoration Design Alternatives Using DRERIP Conceptual Models (Atkins et al. 2013)
- Ecosystem Restoration Program Overview (Garcia et al. 2012)
- Ecosystem Restoration Program Overview (Grover et al. 2013)
- Ecosystem Restoration Program Delta Project Highlights (Lasko and Burmester 2013)
- Ecosystem Restoration Program Signature Project Highlight (Lasko et al. 2012)

In addition, grantees presented findings (both oral presentations and posters) from a number of ERP funded research projects at both the 2012 Bay-Delta Science Conference and 2013 IEP Workshop.

Coordination

Partners, including stakeholders and other State and federal agencies, are essential to accomplishing shared Delta ecosystem restoration visions and goals. The ERP coordinates with a growing number of partners working toward ecosystem restoration within the ERP Focus Area.

California Water Quality Monitoring Council

The California Water Quality Monitoring Council (CWQMC) is required under statute to develop specific recommendations to improve the coordination and cost-effectiveness of water quality and ecosystem monitoring and assessment, enhance integration of monitoring data across departments and agencies, and increase public accessibility to monitoring data and assessment information. A key recommendation of the CWQMC is to provide a platform for intuitive, streamlined public access to water quality and ecosystem information that directly addresses users' questions and decision-making needs. To implement its vision, the CWQMC and its theme-specific workgroups are developing the "My Water Quality" website (www.mywaterquality.ca.gov) to provide a single, global access point to a set of theme-based internet portals. The website is designed around clear intuitive questions that are readily understood by decision makers, agency managers, legislators, scientists, and the public (e.g., Are our aquatic ecosystems healthy?). ERP staff participated in three workgroups addressing issues relevant to aquatic ecosystem health: the California Estuary Monitoring Workgroup (CEMW), California Wetland Monitoring Workgroup, and Healthy Streams Partnership. During Year 13, ERP staff engaged primarily in the CEMW and its efforts to develop content and design for the initial release of the California Estuaries Portal. Among other benefits, the portal will provide a venue to highlight the important work of the ERP and its partners and for communicating information and improved scientific understanding generated through those efforts to a diverse audience. The initial approach for the portal is to use biological response patterns (e.g., trends in abundance) as an indicator of ecological condition. The portal will also provide descriptive information regarding estuaries, links to programs conducting monitoring and/or research in the Bay-Delta, links to data access points, and legal and regulatory background information. Following initial portal release, it is envisioned that the scope of the portal will be expanded to address a broader array of indicators, assess drivers linked to the condition of those indicators, and include performance measures.

Central Valley Regional Water Quality Control Board (CVRWQCB)

Collaboration with the CVRWQCB is key to addressing water quality issues. ERP supported the CVRWQCB Total Maximum Daily Load (TMDL) activities to the extent possible either through funding projects that further the science needed to develop TMDLs, providing support for technical advisory committees for TMDLs, or funding synthesis of literature and recent research used in developing the scientific knowledge

base for regulatory actions. ERP staff participated on various committees and review teams that address ERP water quality priorities.

Central Valley Project Improvement Act (CVPIA)

The CVPIA, enacted in 1992, mandated changes in management of the Central Valley Project (CVP), particularly for the protection, restoration, and enhancement of fish and wildlife. Among its provisions for water transfers and contracts, the CVPIA calls for 800,000 acre-feet of water dedicated to fish and wildlife annually, special efforts to restore anadromous fish populations, a restoration fund financed by water and power users for habitat restoration and enhancement and water and land acquisitions, and firm water supplies for Central Valley wildlife refuges (USBR 2013).

Many CVPIA programs are integrated with ERP implementation and coordination. Such programs include the Anadromous Fish Restoration Program (AFRP), which addresses environmental limiting factors for anadromous fish; the Dedicated Project Yield, which augments flows on the CVP-controlled streams and moderates the CVP pumping from the Delta; and the Anadromous Fish Screen Program (AFSP), which assists in the screening of water diversions to protect fish. ERP staff actively coordinated with the AFRP on restoration activities including providing support for the State Habitat Restoration Coordinators (HRCs) agreement with the USFWS, participating in quarterly AFRP HRC meetings, providing input on project prioritization, and annual work plans. In addition, ERP staff actively coordinated with the AFSP including providing State cost share for priority fish screen projects, participating in quarterly AFSP technical team meetings, and providing input on future fish screen funding priorities.

Delta Conservancy

The Sacramento–San Joaquin Delta Conservancy (Delta Conservancy) was established through legislation to be the primary State agency to implement Delta ecosystem restoration. ERP staff will continue to coordinate and collaborate with the Delta Conservancy on all aspects of Delta restoration.

Delta Stewardship Council

The ERP coordinated with the Delta Stewardship Council (DSC) and Delta Science Program (DSP) in the development of the Delta Plan, particularly the chapters relating to ecosystem restoration, water quality, and adaptive management, as stipulated in a Memorandum of Understanding (MOU), dated January 4, 2011, between CDFW and the DSC. The ERP contributed to the preparation of the Delta Plan, including the development of policies, recommendations, performance measures and supporting text, and review of drafts of the Delta Plan and associated Draft Programmatic Environmental Impact Report. Portions of the Draft ERP Conservation Strategy were incorporated into the Delta Plan and its supporting regulations, including a description of—and rationale for—habitat types targeted for restoration, an elevation map to guide habitat restoration priorities in the Delta, and suggested actions for management of non-native invasive species.

In addition, the ERP coordinated with the DSC to ensure that the ERP adaptive management framework, as revised for the ERP Conservation Strategy, aligns with the

adaptive management framework in the Delta Plan. This represents an initial step in the effort to comply with Delta Plan Policy G P1 (DSC 2013) and its supporting regulations (Water Code § 5002), which require the incorporation of adaptive management into ecosystem restoration and water management covered actions. This requirement is satisfied through both of the following: (1) the adaptive management plan must utilize an approach consistent with the adaptive management framework in Appendix A of the Delta Plan, and (2) documentation of access to adequate resources and delineated authority by the entity responsible for the implementation of the proposed adaptive management process.

The Delta Plan (DSC 2013) calls for the DSP to work with the Interagency Ecological Program, CDFW, and other agencies to develop a Delta Science Plan. The Delta Science Plan is envisioned to address the Delta's large-scale, persistent, and difficult policy and management issues ("grand challenges") through a shared approach for organizing and integrating ongoing scientific research, monitoring, data management, analysis, synthesis, and communication. The Delta Science Plan is currently under development, with the final version to be completed by December 31, 2013. In Year 13, ERP staff provided input to the DSP during initial scoping and planning prior to release of the first draft of the Delta Science Plan.

Year 14 Priorities and Activities

The ERP continues to implement projects that align with the priorities identified in the 2010 PSP (http://www.dfg.ca.gov/erp/grants_2010_grants_psp.asp), furthermore the majority of the activities identified as Year 13 activities (discussed in the prior section) will continue in Year 14.

Grant Program

The ERP will continue processing new grant agreements for projects approved either through the Directed Action process or through the Proposal Solicitation Process. It is anticipated that as many as 11 new agreements may be executed during Year 14.

Grant Management
The ERP Grants Program will manage approximately 70 grants, consisting of ongoing and new grants, as well as work to develop additional grants. Training for Grant Managers will continue as needed and coordination meetings for Grant Managers will be held monthly to ensure that the goals and objectives of the ERP are being met and that projects accomplish approved tasks. In addition, ERP staff will continue to conduct site visits of active and completed projects throughout the Focus Area.

Conservation Strategy
The ERP will finalize the "Conservation Strategy for Restoration of the Sacramento–San Joaquin Delta, Sacramento Valley and San Joaquin Valley Regions" (Conservation Strategy) and anticipate release of the Conservation Strategy in 2014. The Conservation Strategy, built on lessons learned during Stage 1 of CALFED (2000 through 2007), was developed by CDFW collaboratively with USFWS and NMFS. The Conservation Strategy identifies ERP goals and conservation priorities and processes for Stage 2 of CALFED (2008 through 2030), while providing impetus for improvement in the future. The ERP Implementing Agencies will encourage all agencies, groups, or individuals interested in resource conservation and management in the Delta to consider the Conservation Strategy as a resource for coordinating and integrating actions in the Focus Area.

Highlighted Projects Report
During Year 14, the ERP will prepare a report highlighting project activities completed by the Grant Program to date. This report may feature high priority project activities such as at-risk species assessments, habitat restoration, and stressor reduction.

Additional ERP Activities

Adaptive Management
ERP staff will continue to participate in the planning processes for the Bay Delta Conservation Plan, Comprehensive Review of the Bay-Delta Water Quality Control Plan, Delta Plan, Fish Restoration Program Agreements, and other relevant activities in an effort to facilitate the development and implementation of adaptive management

approaches that promote integration across programs and improved efficiency and effectiveness of management actions.

Conceptual Models

Several conceptual models for physical and chemical stressors, species life histories, and delta habitats have been developed in recent years through the DRERIP. The ERP will strive to publish additional models in the upcoming year, in peer-reviewed journals such as the San Francisco Estuary and Watershed Science Online Journal. These models will continue to be used to evaluate restoration actions being considered for the Delta. In addition, the ERP-supported projects are providing detailed information on mercury and methylmercury in managed wetlands that will be used to update the Mercury Conceptual Model.

Workshops

The ERP will continue to convene workshops to help synthesize the current state of the science and to assist the decision making process regarding many of the pressing issues throughout the Bay-Delta Ecosystem. The following four workshops are planned (one project workshop and three public workshops):

Project

Dissolved Oxygen Total Maximum Daily Load for the San Joaquin River: The ERP will convene an independent peer review panel to review the models developed to assist the CVRWQCB in assessing dissolved oxygen loads to the San Joaquin River.

Public

State of the Science Workshop on Fish Predation on Central Valley Salmonids in the Bay-Delta Watershed: This workshop was held in July 2013. The purpose was to have an independent panel of experts summarize the current state of knowledge on predation of Central Valley salmonids by other fish. The panel was provided written material and a full day of oral presentations to assist with their evaluation and response to the charge document developed by agency stakeholders with input from a diverse group of other interested stakeholders. This information will clarify the understanding of the role of fish predation on salmonids and associated factors in salmonid life history for policy decisions focused on improving Central Valley salmonid populations. Additionally, the Panel will be asked to identify data and science gaps that exist and identify a framework for research to support future management decisions.

Biomarkers Workshop: Working with IEP Contaminants Work Team, the ERP, and the State and Federal Contractors Water Agency are convening a Biomarkers Workshop on October 24 and 25, 2013. A Science Advisory Panel will review select papers and hear oral presentations on recent scientific efforts so that they may evaluate what we have learned since the 2007 IEP Biomarkers Workshop on Pelagic Organisms. The Science Advisory Panel will be asked to evaluate the data available from current research on biomarkers to assess organismal health within monitoring programs (such as ambient surface water monitoring programs) as well as determine how best to integrate these

tools into the assessment of the efficacy of restoration programs. Immediate Applications of Panel Report include the ability to 1) Inform current ERP Grants and 2) Identify important data gaps and priority information needs.

Prospect Island Workshop: A second DRERIP scientific evaluation of restoration design alternatives for Prospect Island is scheduled to occur in Year 14 in collaboration with the Fish Restoration Program Agreement. This scientific evaluation, incorporating results of additional hydrodynamic modeling and refinement to the restoration designs, is expected to provide a more detailed evaluation and vetting of the restoration alternatives to advance through the environmental review process.

Outreach

The ERP will continue to share information gained and lessons learned with respect to ecosystem restoration, especially in the Delta. To build on the ERP outreach efforts, the staff will continue to contribute to relevant conferences, symposia, and workshops by assisting in the planning, providing presentations, and presenting posters. Staff will continue to manage and update webpages that provide information on the program, projects, and workshops. Additionally, grantees will be encouraged to produce peer reviewed journal articles, provide presentations, and create posters that will help disseminate information regarding lessons learned and promoting cooperation and coordination with others striving to improve the Delta ecosystem. As described above, the ERP will also seek opportunities to use the My Water Quality portals, notably those associated with aquatic ecosystem health, as venue for communicating scientific information and improved understanding developed through the ERP activities to diverse audiences (e.g., public, agency managers, legislators, and scientists).

Coordination

California Water Quality Monitoring Council

ERP staff will continue to participate in relevant workgroups formed under the auspices of the CWQMC (e.g., California Estuary Monitoring Workgroup, California Wetland Monitoring Workgroup, and the Healthy Streams Partnership). A key milestone is the anticipated public launch of the California Estuaries Portal in October 2013.

Central Valley Regional Water Quality Control Board (CVRWQCB)

Collaboration with the CVRWQCB is key to addressing water quality issues. ERP supports the CVRWQCB Total Maximum Daily Load (TMDL) activities to the extent possible either through funding projects that further the science needed to develop TMDLs, providing support for technical advisory committees for TMDLs, or funding synthesis of literature and recent research used in developing the scientific knowledge base for regulatory actions. ERP staff participates on various committees and review teams that address ERP water quality priorities. The Delta Mercury TMDL and San Joaquin River dissolved oxygen TMDL are the two TMDLs of focus in year 14. Staff also is engaged in the CVRWQCB's effort in developing a regional monitoring program for the Delta.

Central Valley Project Improvement Act (CVPIA)

ERP staff will continue to coordinate with the AFRP on restoration activities including providing support for the State Habitat Restoration Coordinators (HRCs) agreement with the USFWS, participating in the quarterly AFRP HRC meetings, providing input on project prioritization, and annual work plans. In addition, ERP staff will coordinate with the AFSP including providing State cost share for priority fish screen projects, participating in quarterly AFSP technical team meetings, and providing input on future funding commitments by the AFSP.

Delta Habitat Restoration Project Tracking Database

As the primary program responsible for restoration in the Delta over the past 13 years, the ERP, in collaboration with the Delta Conservancy and other restoration practitioners, will actively assist in the development of the Delta Habitat Restoration Project Tracking Database. The database will meet the collective needs for sharing project information, tracking project progress, evaluating performance measures, and informing management decisions. The database will provide project tracking, assessment, and reports that will document ecosystem restoration performance in San Francisco Bay-Delta and Central Valley:

- Inventory of projects planned, underway and completed, including location, acreage, lead agency, status, and funding needs.
- Acres restored by habitat type, per year and cumulative.
- Documented occurrence and use of protected and restored habitats and migratory corridors by native resident and migratory Delta species.
- Prevalence of non-native invasive species.
- Assess progress towards meeting conservation/biological goals.
- Results of monitoring and scientific experiments conducted within restoration projects to assess progress and lessons learned as part of adaptive management cycle.
- Data that can be aggregated at the landscape scale and used to update landscape-scale conceptual models.

Delta Science Program

The ERP will continue to coordinate with the DSP and contribute to the development, and ultimately implementation, of the Delta Science Plan. Through this effort, the ERP will engage in a variety of associated initiatives including integration of adaptive management activities, development of landscape conceptual models for the Sacramento-San Joaquin Delta, development of monitoring and research frameworks (including performance measures), and enhancing data access and interoperability.

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Appendix A. Grant Projects Closed in Year 13

Appendix A. Grant Projects Closed in Year 13

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	Project End Date	ERP Goals Addressed	Topic Area
ERP-05-S28	American Basin Working Landscapes Project	Placer County Resource Conservation District	$1,738,946	12/31/2012	1, 3, 4, 6	Upland Habitat and Wildlife Friendly Agriculture
ERP-04-S16	Clear Creek Anadromous Salmonid Monitoring Program	U.S. Fish and Wildlife Service	$1,965,883	12/31/2011	1 & 3	At-Risk Species Assessment
ERP-12D-S01	Conaway Ranch Agricultural Conservation Easement Acquisition	California Waterfowl Association	$4,000,000	11/29/2013	2, 4	Upland Habitat and Wildlife Friendly Agriculture
ERP-02-P03-D	Dutch Slough Restoration Project	State Coastal Conservancy	$1,500,000	6/30/2013	1, 2, 4	Shallow Water and Marsh Habitat
ERP-02-P08-D	M&T/Llano Seco Fish Screen Facility Short-Term/Long-Term Protection Project	Ducks Unlimited	$4,306,535	6/30/2012	3	Fish Screens
ERP-02D-P60	Pacific Flyway Center Initial Planning Project	Yolo Basin Foundation	$199,522	6/2/2013	1, 2, 4	Environmental Education
ERP-05-S25	Providing Landowner Incentives to Encourage Riparian Restoration and Natural River Processes on Working Landscapes	California State University, Chico Research Foundation	$599,821	12/31/2012	4 & 5	Local Watershed Stewardship
ERP-05-S27	Rice-Cover Crop Rotation Pilot Program	California Waterfowl Association	$1,649,051	2/2/2013	1, 3, 4	At-Risk Species Assessment
ERP-06D-S15	Sacramento River Conservation Area Forum (SRCAF)	Sacramento River Conservation Area Forum	$656,277	12/31/2012	4	Riparian Habitat
ERP-02D-P56	West Coast Ballast Outreach Project	Regents of the University of California	$478,395	6/30/2013	5	Non-Native Invasive Species

Appendix B. Grant Projects Active Year 14

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-05-S30	A Socio-Economic and Behavioral Analysis of Farmers' Decisions to Adopt or Reject the CALFED Conservation Initiatives	Sonoma State University	$175,228	12/30/2013	4	Upland Habitat and Wildlife Friendly Agriculture
ERP-11-S16	A Systems Biology Assessment of EDCs in the Delta	University of California, Davis	$486,411	1/31/2015	1 & 6	Ecosystem Water and Sediment Quality
ERP-09D-S03	American Basin Fish Screen and Habitat Improvement (Phase IV-Construction) Project	Natomas Mutual Water Company	$9,000,000	6/30/2014	1	Fish Screens
ERP-02-P09-D	American Basin Fish Screen and Habitat Improvement Project	Natomas Mutual Water Company	$12,600,000	6/30/2014	1 - 4	Fish Screens
ERP-06D-S18	Anadromous Fish Habitat Monitoring for the Battle Creek Salmon & Steelhead Restoration	U.S. Fish and Wildlife Service	$3,360,000	3/31/2013	2 & 3	At-Risk Species Assessment
ERP-99-B01	Battle Creek Salmon and Steelhead Restoration Project	Bureau of Reclamation	$27,200,000	6/30/2015	1, 2, 4	Fish Passage
ERP-08D-S04	Battle Creek Salmon and Steelhead Restoration Project - Phase 1A	Bureau of Reclamation	$26,812,500	6/30/2015	1 - 4	Fish Passage
ERP-07D-S13	Blacklock Mercury Monitoring	California Department of Fish and Wildlife	$91,276	12/30/2012	6	Ecosystem Water and Sediment Quality
ERP-07D-S05	Blacklock Restoration Project Monitoring	California Department of Water Resources	$382,250	TBD	1, 2, 4, 6	Shallow Water and Marsh Habitat
ERP-04D-S18	BREACH III: Evaluating and Predicting 'Restoration Thresholds' in Evolving Freshwater-Tidal Marshes	U.S. Fish and Wildlife Service	$2,447,998	6/30/2013	1, 2, 4, 6	Shallow Water and Marsh Habitat

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-04-S10	Butte Creek Spring-run Chinook Salmon Life History Investigation	California State University, Chico Research Foundation	$291,661	5/31/2015	1 & 3	At-Risk Species Assessment
ERP-07D-P05	Clear Creek Environmental Water Program	U.S. Fish and Wildlife Service	$813,745	6/30/2014	1 & 3	Hydrodynamics, Sediment Transport, and Flow Regimes
ERP-07D-P04	Clover Creek/Millville Diversion Fisheries Restoration Project	Western Shasta RCD	$2,000,000	TBD	1 - 4	Fish Passage
ERP-07D-P06	Complementing Water Planning Efforts for the Delta and Sacramento River: Application of the Ecological Flows Tool	The Nature Conservancy	$1,715,533	10/31/2012	1 - 6	Hydrodynamics, Sediment Transport, and Flow Regimes
ERP-11-S19	Corona and Twin Peaks Mine Drainage Treatment Project	Tuleyome, Inc.	$1,530,550	2/1/2015	6	Mine Remediation
ERP-13D-S01	Delta Dialogues, Phase II	Sacramento-San Joaquin Delta Conservancy	100,800	6/30/2014	1-3	Local Watershed Stewardship
ERP-05-S34	Delta Working Landscapes	Delta Protection Commission	$800,000	3/31/2013	1, 4, 6	Upland Habitat and Wildlife Friendly Agriculture
ERP-11-S02	Development of a Spatially Explicit Ecosystem Model to Explore Physicochemical Drivers of Step Changes in POD Species and Distribution in the Sacramento-San Joaquin Delta and Suisun Bay	U.S. Geological Survey	$356,402	6/30/2015	1 - 4	Estuary Foodweb Productivity

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-10D-S02	Development of best management practices to reduce methyl mercury exports and concentrations from seasonal wetlands in the Yolo Wildlife Area (DFG)	California Department of Fish and Wildlife	$168,509	2/1/2015	4 & 6	Ecosystem Water and Sediment Quality
ERP-10D-S04	Development of best management practices to reduce methyl mercury exports and concentrations from seasonal wetlands in the Yolo Wildlife Area. (SJSURF)	San Jose State University Foundation	$1,632,491	2/1/2015	6	Ecosystem Water and Sediment Quality
ERP-11D-S03	Ecological Performance of Fishes in an Ever-changing Estuary: The Effects of Nutritional Status on Environmental Stress Tolerance in Sturgeon	University of California, Davis	$472,991	2/1/2015	1	At-Risk Species Assessment
ERP-11-S12	Evaluation of Floodplain Rearing and Migration in the Yolo Bypass	California Department of Water Resources	$878,020	1/31/2015	1, 2, 4	At-Risk Species Assessment
ERP-11D-S18	Expanding Fish Tracking Array with Real-Time Monitoring of Tagged Sturgeon and Salmonids	University of California, Davis	$690,593	3/31/2014	1 & 2	At-Risk Species Assessment
ERP-11D-S17	Fall X2 Fish Health Study: Contrasts in Health Indices, Growth and Reproductive Fitness of Delta Smelt and Other Pelagic Fishes Rearing in the Low Salinity Zone and Cache Slough Regions	University of California, Davis	$2,980,196	12/15/2014	1 & 2	At-Risk Species Assessment
ERP-05-S26	Fish Friendly Farming Environmental Certification Program	California Land Stewardship Institute	$1,000,243	12/31/2012	1, 4, 5, 6	Upland Habitat and Wildlife Friendly Agriculture

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-10D-S01	Fish Passage Improvement Program	California Department of Water Resources	$1,307,000	3/31/2014	1 & 3	Fish Passage
ERP-11D-S21	Groundwater Monitoring Plan for the Lake Davis Pike Eradication Project	California Department of Fish and Wildlife	$49,000	7/1/2014	5	Ecosystem Water and Sediment Quality
ERP-07D-P03	Hill Slough West Restoration Project, Phase I - Preliminary Restoration Design, Environmental Documentation and Permitting	California Wildlife Foundation	$646,642	6/30/2013	1, 2, 4	Shallow Water and Marsh Habitat
ERP-11-S14	Identifying habitat characteristics that support native fish in the Delta and Suisun Marsh	University of California, Davis	$1,152,195	3/31/2015	1 - 4	Shallow Water and Marsh Habitat
ERP-10D-P01	IRWM Fish and Productivity Data Analysis and Interpretation	Association of Bay Area Governments	$420,000	3/31/2013	1, 2, 4	Shallow Water and Marsh Habitat
ERP-11-S15	Linking Habitat and Spatial Variability to Native Fish Predation	University of California, Davis	$730,307	1/31/2015	1 - 3	Non-Native Invasive Species
ERP-11-S09	Lower Clear Creek Aquatic Habitat and Mercury Abatement Project	Western Shasta Resource Conservation District	$4,539,015	8/14/2015	1 - 4	Ecosystem Water and Sediment Quality
ERP-05D-S18	Lower Clear Creek Floodway Rehabilitation Project (Phase 3B)	Western Shasta Resource Conservation District	$3,482,451	12/31/2015	1 - 4	River Channel Restoration
ERP-11-S06	Lower Cosumnes River Floodplain Restoration Project	Ducks Unlimited	$1,244,991	12/31/2015	1,2,4	Lowland Floodplains and Bypasses

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-11-S13	Lower Putah Creek Restoration from Toe Drain to Monticello Dam: Project Description Development, CEQA Compliance, Permits, Selected Final Design	Yolo Basin Foundation	$2,160,375	3/31/2015	1,2,5,6	River Channel Restoration
ERP-07D-S06	Lower Yolo Bypass Collaborative Process Project	Center for Collaborative Policy	$300,000	6/30/2013	1 - 6	Lowland Floodplains and Bypasses
ERP-12D-S02	M&T Chico Ranch/Llano Seco Rancho Fish Screen Facility Long-term Protection Project: Evaluation of Rock Removal on the Sacramento River (RM 194-187)	Ducks Unlimited	$53,000	6/30/2014	1, 2, 4	River Channel Restoration
ERP-11D-S01	M&T/Llano Seco Fish Screen Facility Long-Term Protection Project (Phase IV)	Ducks Unlimited	$2,480,610	9/1/2014	1, 2, 4	Fish Screens
ERP-11D-S20	M&T/Llano Seco Fish Screen Facility Short-Term Protection Project-Environmental Compliance	Ducks Unlimited	$542,640	6/30/2014	1, 2, 4	Fish Screens
ERP-11-S08	Management Tools for Landscape-Scale Restoration of Ecological Functions in the Delta	Aquatic Science Center	$875,000	1/31/2015	1, 2, 4	Shallow Water and Marsh Habitat
ERP-11-S05	Managing Natural Resources for Adaptive Capacity: the Central Valley Chinook Salmon Portfolio	University of California, Berkeley	$489,319	9/30/2015	1,3	At-Risk Species Assessment
ERP-11-S07	McCormack-Williamson Tract Flood Control and Ecosystem Restoration	Reclamation District 2110	$3,314,300	12/31/2017	2	Lowland Floodplains and Bypasses
ERP-02D-C12	Mercury in San Francisco Bay-Delta Birds: Trophic Pathways, Bioaccumulation and Ecotoxicological Risk to Avian Reproduction	U.S. Fish and Wildlife Service	$5,823,262	6/30/2014	1, 3, 6	Ecosystem Water and Sediment Quality

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-04-S15	Monitoring Responses of the Delta Smelt Population to Multiple Restoration Actions in the San Francisco Estuary	University of California, Davis	$1,499,181	12/30/2011	1	At-Risk Species Assessment
ERP-03-M10	Outreach and Technical Services to Support Landowner and Watershed Resident's Participation in the Battle Creek Salmon and Steelhead Restoration Project	Battle Creek Watershed Conservancy	$785,618	8/31/2014	1 & 3	Local Watershed Stewardship
ERP-02D-C11	Recovery Implementation for Riparian Brush Rabbit and Riparian Woodrat on the Lower Stanislaus River	U.S. Fish and Wildlife Service	$5,465,944	12/31/2012	1, 2, 3, 5	At-Risk Species Assessment
ERP-08D-S05	Refine the fall-run Chinook salmon population model	California State University, Fresno Foundation	$1,000,000	12/31/2012	1 - 3	At-Risk Species Assessment
ERP-02-P16-D	Restoration of the Confluence Area of the Sacramento River, Big Chico and Mud Creeks	The Nature Conservancy	$2,603,377	1/31/2015	1, 2, 4, 6	Lowland Floodplains and Bypasses
ERP-02D-P54	Restoring Ecosystem Integrity in the Northwest Delta: Phase II	Solano Land Trust	$1,781,658	3/31/2013	1 - 5	Riparian Habitat
ERP-05D-S29	Riparian Sanctuary (Phase II) – Bringing Agricultural and Ecological Interests Together for Pumping Plant Protection and Riparian Restoration (Sacramento River Mile 178) - Design Development and Environmental Compliance	River Partners	$683,698	9/30/2013	1,2,4,5	River Channel Restoration
ERP-07D-S08	Sacramento Valley/Delta Fish Screen Program	Family Water Alliance	$4,525,636	12/31/2012	1 & 3	Fish Screens

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-09D-S02	Sacramento-Central Valley Fish Screen Program	Family Water Alliance	$1,500,000	6/30/2013	1 & 3	Fish Screens
ERP-11-S11	Salinity effects on native and introduced SAV of Suisun Bay and the Delta	California State University, San Francisco Romberg Tiburon Center	$412,410	1/31/2015	1, 2, 4, 5	Shallow Water and Marsh Habitat
ERP-08D-S03	San Joaquin River Dissolved Oxygen/Oxygen-consuming materials in San Joaquin River	University of the Pacific	$2,992,933	6/30/2013	1 & 6	Ecosystem Water and Sediment Quality
ERP-05-S23	Selby Creek Stream Habitat Restoration and Riparian Revegetation Project	Bioengineering Institute	$475,000	12/30/2013	4	Upland Habitat and Wildlife Friendly Agriculture
ERP-07D-P02	Suisun Marsh Land Acquisition and Tidal Marsh Restoration - Elevation and Contaminant Surveys, Review of Land Acquisition Package, and Review of Property Appraisal	Wildlife Conservation Board	$926,870	6/30/2014	1 - 6	Shallow Water and Marsh Habitat
ERP-07D-P01	Suisun Marsh Land Acquisition and Tidal Marsh Restoration - Public Notification and Site Selection	Suisun Resource Conservation District	$16,500	12/31/2012	1 - 6	Shallow Water and Marsh Habitat
ERP-11-S04	Survival and Migratory Patterns of Juvenile Spring and Full Run Chinook Salmon in Sacramento River and Delta	University of California, Davis	$1,746,955	2/28/2015	1 & 3	At-Risk Species Assessment
ERP-04D-S08c	Upper Sacramento River Winter Chinook Salmon Carcass Survey Project (USFWS)	U.S. Fish and Wildlife Service	$496,210	3/31/2013	1 & 3	At-Risk Species Assessment

Appendix B. Grant Projects Active in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-11D-S22	Water Quality Effects on Survival, Growth, and Feeding Performance in Larval Delta Smelt from the Sacramento-San Joaquin Delta	U.S. Fish and Wildlife Service	$224,760	2/28/2015	6	At-Risk Species Assessment
ERP-10D-S05	West Stanislaus Irrigation District Fish Screen Intake Final Design Planning, Environmental Compliance and Permitting Project	Western Stanislaus Irrigation District	$2,600,000	3/31/2015	1 & 3	Fish Screens
ERP-11-S10	Wetland and Rice Management to Limit Methylmercury Production and Export	U.S. Geological Survey	$197,416	10/15/2013	6	Ecosystem Water and Sediment Quality
ERP-07D-P07	Wildlife and Vegetation Response to Experimental and Restoration of Flooded Riparian Forest Habitat for The Cosumnes River Preserve	The Nature Conservancy	$2,055,022	6/30/2015	1, 3, 4	Lowland Floodplains and Bypasses
ERP-12D-S03	Working Waterways Program	Yolo County Resource Conservation District	$643,936	12/31/2014	1 - 4	Upland Habitat and Wildlife Friendly Agriculture
ERP-09D-S05	Yuba City Fish Screen Project	City of Yuba City	$500,000	6/30/2012	1 & 3	Fish Screens