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

Ecosystem Restoration Program Plan and Annual Report Year 15

(State FY 2014-15)

June 30, 2014

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. We have altered this vital ecological and economic link for California and the world 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.

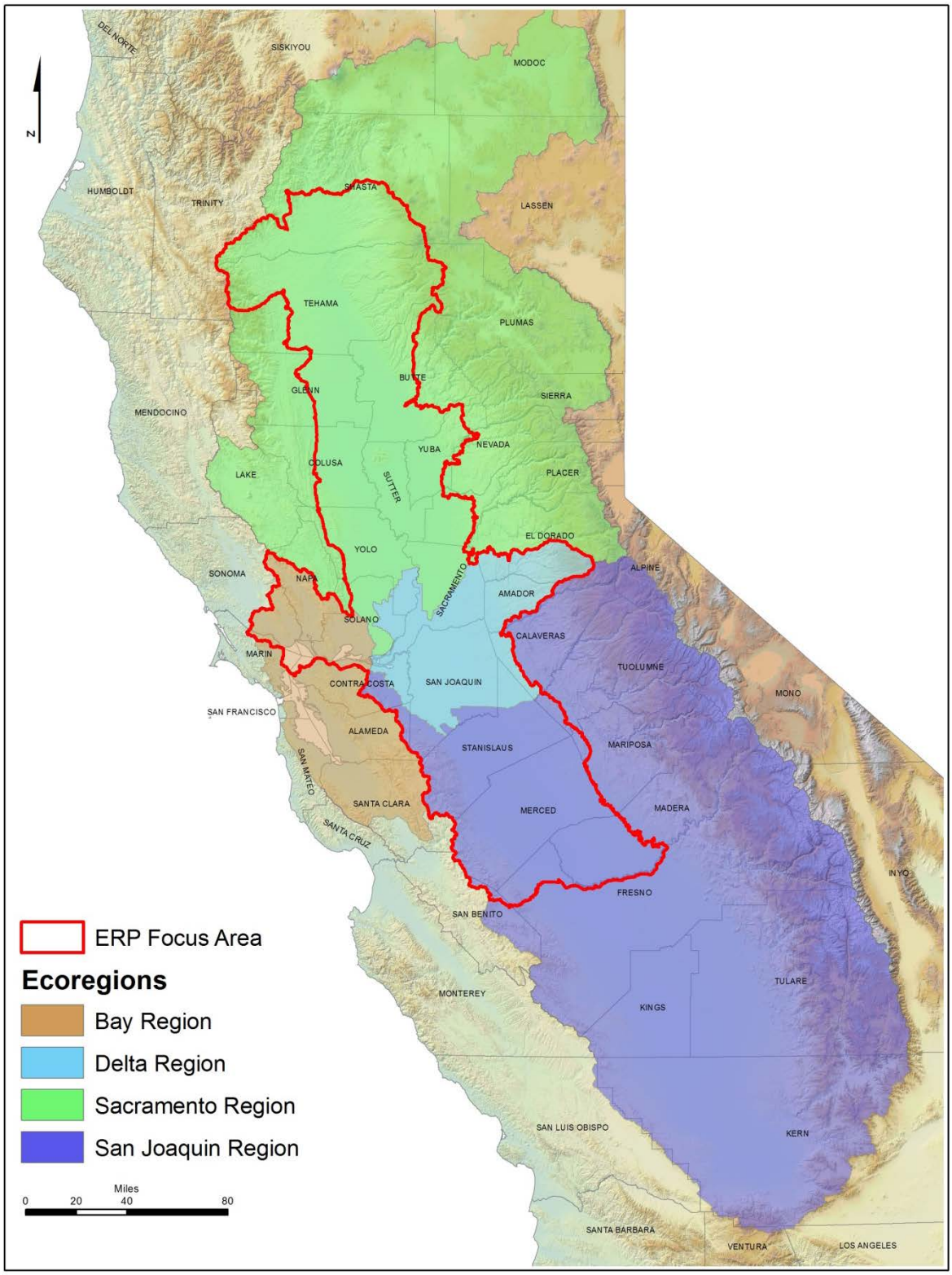
The ERP Focus Area includes the Delta, Suisun Bay, the Sacramento River below Shasta Dam, the San Joaquin River below the confluence with the Merced River, and other major tributary watersheds directly connected to the Bay–Delta ecosystem below major dams and reservoirs (Figure 1). Principle participants overseeing 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.

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 ERP. The following are the six strategic goals (CDFW et al. 2014) that guide ERP:

1. Recover endangered and other at-risk species and native biotic communities
2. Rehabilitate ecological processes
3. Maintain or enhance harvested species and their populations
4. Protect, restore, and/or enhance habitats
5. Prevent or control non-native invasive species
6. Improve or maintain water and sediment quality

This document, the Ecosystem Restoration Program Plan and Annual Report, Year 15, describes the progress made toward achieving these six strategic goals. It summarizes the activities accomplished by ERP during the previous State fiscal year, Year 14, while identifying priority activities for the current fiscal year, Year 15, including activities completed by CDFW ERP staff.

Figure 1
ERP Focus Area



ERP Funding

Funding for ERP has come from both State and federal sources. In addition, ERP funding provides match for 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 15, 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 2014-2015. A portion of this funding will support staff that will manage approximately 44 projects (plus approximately nine new projects) expected to be active during Year 15, 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 Grants Program.

Federal Funding

In addition to the funding that the State provides for the ERP Grants 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 2015, approximately $56.6 million would fund additional ecosystem restoration activities through various agencies, programs, partnerships, operations, and direct habitat restoration projects (Table 1) (USFWS 2014).

Table 1
Federal Year 15 Requests

Agency Activities, Projects, and Programs	Request
Anadromous Fish Restoration Program (AFRP)	$11,379,000
Anadromous Fish Screen Program (AFSP)	$4,150,000
CALFED Coordination	$100,000
CALFED Program Management, Oversight, and Coordination	$1,700,000
Clear Creek Restoration	$1,080,000
Dedicated Project Yield	$700,000
Ecosystem Restoration Program (ERP) Oversight & Coordination	$140,000
Habitat Restoration	$4,037,000
Hamilton City, CA	$3,800,000
Other CVP Impacts	$1,700,000
Renewed Federal State Partnership	$110,000
Screen Engineering and Review	$70,000
Spawning Gravel/Riparian Habitat	$1,690,000
Suisun Marsh Protection	$1,253,000
Water Acquisition	$ 24,655,000
Total Expenditures	**$56,564,000**

Year 14 Activities

ERP Grant Program

A principle activity of ERP is to implement projects within the Focus Area through grants administered by the ERP Grants Program. 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 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 14. Most of these projects provide multiple benefits and often contribute to more than one topic area, for tracking purposes we have listed projects here by the primary topic that they address.

Table 2
Summary Projects Funded by ERP through Year 14

Topic Area	Number of Projects	Amount Approved
At-Risk Species Assessment	57	$57,151,597
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	19	$82,189,111
Fish Screens	65	$122,431,726
Harvestable Species Assessment	2	$774,500
Hydrodynamics, Sediment Transport, and Flow Regimes	29	$36,876,141
Local Watershed Stewardship	54	$19,114,716
Lowland Floodplains and Bypasses	29	$42,707,792
Mine Remediation	4	$2,177,550
Non-Native Invasive Species	34	$33,109,176
Riparian Habitat	31	$47,572,599
River Channel Restoration	18	$24,527,234
Shallow Water and Marsh Habitat	52	$74,165,441
Upland Habitat and Wildlife Friendly Agriculture	21	$66,970,718
X2 Relationships (Freshwater-Seawater Interface)	1	$509,222
Totals	**528**	**$706,979,503**

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, ERP has decided to no longer track technical support, administrative, or program support projects in this table.

Grant Management

In Year 14, ERP managed 65 projects, 21 projects were completed (Appendix A). Of the 65 projects, four initiated work in Year 14. Appendix B provides a summary of the remaining 44 projects that will continue to be active in or will start in Year 15. Staff also worked to develop additional projects for Year 15, which are pending approval. For specific information about any of the ERP projects, please contact ERP staff directly (http://www.dfg.ca.gov/erp/).

ERP Projects Database

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. ERP is required to report project information from the ERP Projects Database to update the Delta Stewardship Council on ERP's progress twice a year (June and December). ERP also uses the ERP Projects Database 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 14 Project Highlights

The following are some of the high profile projects that ERP has completed in Year 14. The Ecosystem Restoration Program Activities Report Year 15 provides a complete record of the progress of all ERP and ERP related projects and program activities.

BREACH III: Evaluating and Predicting 'Restoration Thresholds' in Evolving Freshwater-Tidal Marshes: Liberty Island is located at the downstream end of the Yolo Bypass, a floodplain for the Sacramento River. After levee failure restored tidal flows to Liberty Island in 1997, passive restoration has been underway. Because of these factors, scientists identified Liberty Island as an ideal site for research that well informs future decisions as well as helps us understand some the current conditions in the Delta. Breach III focuses research and modeling studies on the biological and physical changes that have taken place on Liberty Island in California's North Delta region. The Breach III project has produced a number of scientific reports on food web dynamics, emergent marsh evolution as well as data on nekton and fish populations. The papers are available on the Breach III website (https://sites.google.com/a/uw.edu/breach-iii/). In addition to the research created under the grant, the Breach III team created hydrodynamic and landscape and other models for Liberty Island functions and processes. ERP funded researchers presented the results of the landscape model to the restoration and management communities in a special workshop in June 2013. The materials from the presentation as well as papers on the models are also available on the Breach website. Before the end of 2014, ERP funded researchers will prepare a final synthesis report that ties together the various disciplines and predictive models. The synthesis report will address ecosystem status and trends at Liberty Island, restoration trajectories, limiting and driving factors and other subjects of interest to restoration and management practitioners.

Complementing Water Planning Efforts for the Delta and Sacramento River: Application of the Ecological Flows Tool:The Nature Conservancy completed the Ecological Flows Tool (EFT), a decision support tool emphasizing clear communication of trade-offs for key ecosystem targets associated with alternative conveyance, water operations and climate futures in the Sacramento River and San Francisco Delta eco-regions. Practical integration of multi-species, multi-habitat needs in the evaluation of water operation scenarios is challenging. EFT facilitates the inclusion of a broad suite of ecological considerations into water use planning exercises. EFT takes a bottom-up, process-based view of how flow and related aquatic habitat variables (e.g. salinity, temperature, turbidity) are tied to a variety of ecosystem functions for representative sets of focal species and habitats (Chinook Salmon, Steelhead, Green Sturgeon, Delta Smelt, Splittail, tidal wetlands, invasive species deterrence, Bank Swallows, channel erosion/migration, Fremont Cottonwoods, large woody debris recruitment). By leveraging many of the same planning models used in existing socioeconomic evaluations in California (e.g., CALSIM, DSM2), EFT provides an "eco plug-in" to the water studies based on use of these models. EFT vision is to link physical models to a representative sampling of individual ecosystem components inside an overall compressed, cross-disciplinary synthesis tool for evaluating conveyance operation alternatives both in the Delta and Sacramento River eco-regions.

Sacramento Valley/Delta Fish Screen Program: In partnership with the ERP, the Anadromous Fish Screen Program, and Family Water Alliance, ERP screened 12 diversions (totaling 630 cfs) along the Sacramento River and Steamboat Slough in the Delta. The Sacramento Valley/Delta Fish Screen Program screened diversions that ranged in size from 9 to 154 cfs. Researchers collected fish entrainment monitoring data for two diversion seasons at the sites, typically April to September, prior to screen installation that occurred at the end of the second irrigation season. In July 2013, Natural Resource Scientists, Inc. completed the final entrainment monitoring report for the project titled, "*Evaluation of Fish Entrainment in 12 Unscreened Sacramento River Diversions*."

San Joaquin River Dissolved Oxygen/Oxygen-consuming materials in San Joaquin River: The purpose of this project is to collect and analyze data on the sources of nutrients, phytoplankton and oxygen-consuming materials in the San Joaquin River (SJR) estuary to support the development of an estuary model. The Central Valley Regional Water Quality Control Board (Regional Board) needs this model to complete the SJR Dissolved Oxygen (DO) Total Maximum Daily Load (TMDL) development and allocation process. Stringfellow (2013) provided the following results. The direct measurements and modeling with the Watershed Area Risk Management Framework (WARMF)-2008 and WARMF-2012 models indicate that tributaries in the southern portion of the study area contribute a disproportionate amount of oxygen demanding substances (ODS) compared to flows. Salt Slough and Mud Slough are particularly identified as contributing phytoplankton that then grow in the river and cause an impact in excess of their original discharge of ODS. However, both the modeling and mass balance results indicate that phytoplankton are only one component of ODS in the SJR and that other materials, such as organic carbon and ammonia-N, are contributing ODS

to the river. All analysis indicated that the three east-side rivers, the Merced, Tuolumne, and Stanislaus Rivers, could not be entirely ignored as sources of ODS to the SJR. Ammonia-N discharges are an important ODS source, but also contribute to ODS by stimulating phytoplankton growth in the river. Both model results and the mass balance suggest ammonia-N is more important to the stimulation of phytoplankton growth than nitrate, but model results suggest reducing total nitrogen in the river is necessary to reduce eutrophication. Phosphorous is entering the SJR from many sources, although Harding Drain contributes the most phosphorous from a single drainage. Modeling does not support the implementation of a phosphate control plan to control eutrophication, in part because of the large amounts of phosphate are apparently stored in the SJR.

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.

ERP Conservation Strategy of the San-Joaquin-Sacramento Delta, Sacramento Valley and San Joaquin Valley Regions (ERP Conservation Strategy)

CDFW has led the effort to develop the ERP Conservation Strategy in collaboration with the USFWS and the NMFS, which together comprise the three implementing agencies for ERP. ERP staff developed the ERP Conservation Strategy to help guide future environmental restoration, develop priorities and processes, and establish adaptive management to guide and improve restoration success in the Sacramento-San Joaquin Delta and its watershed.

To create the ERP Conservation Strategy, ERP staff incorporated lessons learned during Stage 1 of CALFED, used best available science on current ecological conditions, reviewed related programs and planning efforts, and sought input from stakeholders and the public. It identifies ERP goals, conservation priorities and species-specific conservation actions for Stage 2 of CALFED (2008 through 2030). ERP Implementing Agencies will use the Strategy to help guide environmental restoration. It will provide flexibility in adapting responses accordingly to new scientific findings, addressing changing circumstances, and in the development of new or modified future conservation priorities (CDFW et al. 2014).

Adaptive Management and Performance Measures

ERP has developed an adaptive management framework, which is included in the 2014 ERP Conservation Strategy. ERP is collaborating with other programs and 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 is learned.

During Year 14, ERP staff contributed to the development of the adaptive management and monitoring program, as well as governance structures, for the Bay Delta Conservation Plan (BDCP). ERP engaged in the ongoing effort to develop a monitoring and research framework to assess the effectiveness of tidal wetland restoration actions. ERP staff, in collaboration with other CDFW staff through the Science Institute, developed an adaptive management document that is meant to serve as an informational resource to CDFW staff as they incorporate adaptive management in their conservation and resource management decisions and planning documents pursuant to Assembly Bill 2402 (Huffman, 2012) and other statutory requirements. ERP staff continued to support efforts to facilitate the development and adoption of adaptive management approaches through the revised Bay-Delta Water Quality Control Plan, BDCP, and other relevant planning initiatives that are consistent with the 2014 ERP Conservation Strategy and the Delta Plan. This represents an important component of the ongoing effort to foster more efficient and effective implementation of 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
- track progress towards achieving stated objectives (Dahm et al. 2009)

In Year 14, ERP made significant progress towards generating performance measures for ecosystem restoration activities in the Delta, including coordinating with efforts to generate performance measures for the Delta ecosystem that are underway:

- the Delta Plan, in coordination with the Delta Science Program (DSP), and Delta Stewardship Council (DSC)
- the California Estuary Monitoring Workgroup for the California Estuaries Portal at the California Water Quality Monitoring Council's My Water Quality web portal (http://www.mywaterquality.ca.gov/eco_health/estuaries/)

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. Scientist developed the models using a common approach and a robust set of tools so that this process would support consistent application of adaptive management. Recent uses of the models and action evaluation process include evaluations of BDCP draft conservation measures (2009), BDCP south Delta corridors evaluation (2012), and evaluation of restoration alternatives at Prospect Island (2012) and Lower Yolo Ranch (2013). 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.

Contaminants and Water Quality

Ecosystem water quality is an important aspect of the ERP work effort. 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 14, 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

Biomarkers Workshop: Working with IEP Contaminants Work Team, ERP, and the State and Federal Contractors Water Agency convened a Biomarkers Workshop on October 24 and 25, 2013. A Science Advisory Panel reviewed select papers and heard oral presentations on recent scientific efforts so that they could evaluate what we have learned since the 2007 IEP Biomarkers Workshop on Pelagic Organisms. The Science Advisory Panel evaluated 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 determined how best to integrate these tools into the assessment of the efficacy of restoration programs. Immediate Applications of Panel Report included the ability to 1) Inform current ERP Grants and 2) Identify important data gaps and priority information needs.

Prospect Island Workshop: ERP supported a second DRERIP scientific evaluation of restoration design alternatives for Prospect Island in Year 14 in collaboration with the Fish Restoration Program (FRP). This scientific evaluation, incorporated results of

additional hydrodynamic modeling and refinement to the restoration designs, provided a more detailed evaluation and vetting of the restoration alternatives to advance through the environmental review process.

State of the Science Workshop on Fish Predation on Central Valley Salmonids in the Bay-Delta Watershed: ERP and the DSP held this workshop 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 workshop sponsors provided the panel with 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 clarified 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 identified data and science gaps that exist and identified a framework for research to support future management decisions.

*Technical Advisory Committee for the Delta Methylmercury Total Maximum Daily Load***:** ERP provided 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 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.

Outreach

ERP recognizes the importance of sharing information gained and lessons learned in respect to ecosystem restoration, especially in the Delta. To build on 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. 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.

Highlighted Projects Report

During Year 14, ERP prepared a report highlighting project activities completed by the Grant Program to date. This report featured high priority project activities such as at-risk species assessments, habitat restoration, and stressor reduction.

White Papers

ERP staff carried out a series of thematic reviews of ERP projects. These reviews synthesize ERP contributions to ecosystem restoration and summarize lessons learned. ERP staff completed three reviews in Year 14 that covered the topics of fish screens, simulation models, and wildlife-friendly agriculture. The first white paper titled

"Ecosystem Restoration Program Participation in the Screening of Diversions in the Sacramento-San Joaquin and Bay-Delta Watershed" completed a review of funded ERP fish screen projects (CDFW 2014a), which provided a record of fish screens constructed/diversions screened by ERP, reviewed California Code, CDFW policy and fish screen criteria and literature and the current science, and discussed the perceived value of additional future fish screen projects. Another white paper titled "Review of Ecosystem Restoration Program Simulation Modeling Projects" reviewed ERP-funded projects that included the development of simulation models and/or decision support tools designed to improve understanding of ecosystem processes and functions and support resource planning decisions (CDFW 2014b). The final white paper titled "Wildlife-Friendly Agriculture: What We Have Accomplished, What We Have Learned" reviewed all ERP funded projects with a wildlife-agriculture nexus to capture what they have accomplished including quantitative outcomes and to document major research findings and recommendations (CDFW 2014c).

Coordination

Partners, including stakeholders and other State and federal agencies, are essential to accomplishing shared Bay-Delta ecosystem restoration visions and goals. 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 have developed the "My Water Quality" web portal (www.mywaterquality.ca.gov) to provide a single, global access point to a set of theme-based internet portals. CWQMC designed the website around clear intuitive questions that decision makers, agency managers, legislators, scientists, and the public can readily understood (e.g. Are our aquatic ecosystems healthy?). ERP staff participated in two workgroups addressing issues relevant to aquatic ecosystem health: the California Estuary Monitoring Workgroup (CEMW) and California Wetland Monitoring Workgroup. During Year 14, ERP staff engaged primarily in the CEMW to develop content and design for the initial release of the California Estuaries Portal. A key milestone was the public release of the California Estuaries Portal in October 2013. Among other benefits, the portal provides a venue to highlight the important work of ERP and its partners and for communicating information and improved scientific understanding generated through those efforts to a diverse audience. The initial portal pages use biological response patterns (e.g. trends in abundance) as an indicator of ecological condition. The portal also provides 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. The next phase of development includes providing additional data and information on other ecosystem attributes and drivers. ERP Performance Measures unit staff and CEMW are coordinating with the San Francisco Estuary Partnership, DSP, DSC, and other agency, academic, and NGO scientists to develop the 2015 State of the Estuary Report, which will include new Estuary-wide and Delta-specific indicators of ecosystem health in a report card format, building on the State of the San Francisco Bay 2011 Report (http://www.sfestuary.org/about-the-estuary/sotb/).

Central Valley Regional Water Quality Control Board (CVRWQCB)

Key to addressing water quality issues is collaboration with the CVRWQCB. 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. The Delta Mercury TMDL and San Joaquin River dissolved oxygen TMDL were 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)

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, 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 (U.S. Bureau of Reclamation 2013).

The U.S. Bureau of Reclamation integrates ERP implementation and coordination with CVPIA programs. Such programs include 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 AFSP, which assists in the screening of water diversions to protect fish. ERP staff actively coordinated with AFRP on restoration activities including providing support for the State Habitat Restoration Coordinators (HRCs) agreement with USFWS, participating in quarterly AFRP HRC meetings, providing input on project prioritization, and annual work plans. In addition, ERP staff actively coordinated with 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 Act (Chapter 5, Statutes of 2009) established the Sacramento–San Joaquin Delta Conservancy (Delta Conservancy) as the primary State agency to implement Delta ecosystem restoration. ERP staff coordinated and collaborated with the Delta Conservancy on all aspects of Delta

restoration. ERP staff participated on a technical team to develop a unified habitat tracking database for the Bay-Delta (i.e. Delta Habitat Restoration Project Tracking Database), as part of an ongoing project led by the Delta Conservancy, San Francisco Estuary Institute, San Francisco Bay Joint Venture, and Central Valley Joint Venture. The Delta Habitat Restoration Project Tracking 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 Stewardship Council

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.

During Year 14, ERP staff provided input to the DSP in their development of the Delta Science Plan. The Delta Science Plan addresses the Delta's large-scale, persistent, and difficult policy and management issues through a shared approach for organizing and integrating ongoing scientific research, monitoring, data management, analysis, synthesis, and communication. ERP staff also engaged in activities related to implementation of the Delta Science Plan, including development of the Interim Science Action Agenda and the 2014 Environmental Data Summit. ERP staff also served on the planning committees for the DSP workshops on (1) delta outflows and related stressors and (2) interior delta flows and related stressors. The purpose of these two workshops was to identify the best available science to inform the State Water Resource Control Board's Comprehensive Review of the Bay-Delta Water Quality Control Plan.

Delta Vision Foundation

ERP staff provided information on ERP activities for the Delta Vision Foundation, in support of the 2014 Delta Vision Report Card (Delta Vision Foundation 2014). The Delta Vision Report Card assesses the status of the Delta ecosystem and water supply

reliability and the progress and effectiveness of agencies and organizations in implementing the actions recommended in the Delta Vision Strategic Plan (Delta Vision Blue Ribbon Task Force 2008).

NOAA Fisheries Central Valley Salmon and Steelhead Recovery Planning
The Endangered Species Act (ESA) requires that recovery plans are developed for each species on the Federal list of threatened or endangered species. NOAA Fisheries' recovery planning process for federally listed anadromous salmonids in the Central Valley took a key step in 2001 with the formation of a Technical Recovery Team (TRT) composed of federal, state, and academic experts. The TRT was tasked with providing the scientific foundation for recovery planners to use in developing a recovery plan for the Sacramento River winter-run Chinook salmon evolutionarily significant unit (ESU), the Central Valley spring-run Chinook salmon ESU, and the Central Valley steelhead distinct population segment. In 2007, NOAA Fisheries formed a recovery team to develop and implement a recovery plan for these three species. Using TRT science products as a foundation, and incorporating co-manager and public input, the recovery team developed a final recovery plan that was released in July 2014. That recovery plan is a key resource for helping to achieve ERP goals.

This Conservation Strategy and the recovery plan share the goal of recovering at risk species. As such, the effectiveness and chances for success of both planning efforts, and others, increases by aligning priorities and coordinating actions. The ERP Implementing Agencies will strive for such coordination and leverage the areas where priorities overlap in order to recover winter-run Chinook salmon, spring-run Chinook salmon, and steelhead.

Year 15 Priorities and Activities

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 14 activities (discussed in the prior section) will continue in Year 15.

Grant Program

ERP will continue processing new grant agreements for projects approved either through the Directed Action process or through the Proposal Solicitation Process. ERP anticipates that as many as nine new agreements that the ERP Implementing Agencies may approve during Year 15.

Grant Management
The ERP Grants Program will manage approximately 44 projects (projects continuing from Year 14) plus new projects (approximately nine to begin in Year 15), as well as work to develop additional projects. ERP will hold training for Grant Managers as needed and coordinate monthly meetings for Grant Managers to ensure that projects meet the goals and objectives of ERP and that projects accomplish approved tasks. In

addition, ERP staff will conduct site visits of active and completed projects throughout the Focus Area.

Additional ERP Activities

Adaptive Management
ERP staff will continue to participate in the planning processes for the BDCP, Comprehensive Review of the Bay-Delta Water Quality Control Plan, Delta Plan, Fish Restoration Program, 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
ERP has supported the development of several conceptual models for physical and chemical stressors, species life histories, and delta habitats in recent years through DRERIP. 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. Restoration planners will use these conceptual models to evaluate restoration actions that planners are considering for the Delta.

Workshops
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.

Outreach
ERP will continue to share information gained and lessons learned with respect to ecosystem restoration, especially in the Delta. To build on 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, 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 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). ERP Performance Measures unit staff and CEMW will continue to coordinate with the San Francisco Estuary Partnership, Delta Science Program, Delta Stewardship Council, and other agency, academic, and NGO scientists, to develop the 2015 State of the Estuary Report, which will include new Estuary-wide and Delta-specific indicators of ecosystem health in a report card format, building on the State of the San Francisco Bay 2011 Report (http://www.sfestuary.org/about-the-estuary/sotb/).

Central Valley Regional Water Quality Control Board (CVRWQCB)

Collaboration with the CVRWQCB is important to addressing water quality issues. ERP will continue to support the CVRWQCB TMDL activities to the extent possible through funding projects that further the science needed to develop TMDLs, provide support for technical advisory committees for TMDLs, or fund synthesis of literature and recent research used in develop the scientific knowledge base for regulatory actions. ERP staff will participate on various committees and review teams that address ERP water quality priorities.

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 Conservancy

ERP staff will continue to coordinate and collaborate with the Delta Conservancy on all aspects of Delta restoration. ERP staff will participate on a technical team to develop the Habitat Restoration Project Tracking Database, as part of an ongoing project led by the Delta Conservancy, San Francisco Estuary Institute, San Francisco Bay Joint Venture, and Central Valley Joint Venture.

Delta Stewardship Council

ERP will coordinate with the DSC and DSP. ERP will continue to coordinate with the DSP and contribute to the implementation of the Delta Science Plan. Through this effort, 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), reporting Delta Plan performance measures, and enhancing data access and interoperability.

Delta Vision Foundation

ERP staff will provide information on ERP activities for the Delta Vision Foundation, in support of the 2015 Delta Vision Report Card.

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Appendix A. Grant Projects Closed in Year 14

Appendix A. Grant Projects Closed in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	Project End Date	ERP Goals Addressed	Type of Restoration Project
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-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
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	4/30/2014	1 – 6	Hydrodynamics, Sediment Transport, and Flow Regimes
ERP-05-S34	Delta Working Landscapes	Delta Protection Commission	$800,000	9/30/2013	1, 4, 6	Local Watershed Stewardship
ERP-11D-S18	Expanding Fish Tracking Array with Real-Time Monitoring of Tagged Sturgeon and Salmonids	University of California, Davis	$420,392	3/31/2014	1 & 2	At-Risk Species Assessment
ERP-05-S26	Fish Friendly Farming Environmental Certification Program	California Land Stewardship Institute	$1,000,243	12/31/2013	1, 4, 5, 6	Local Watershed Stewardship
ERP-10D-S01	Fish Passage Improvement Program	California Department of Water Resources	$1,307,000	3/31/2014	1 & 3	Fish Passage
ERP-10D-P01	IRWM Fish and Productivity Data Analysis and Interpretation	Association of Bay Area Governments	$420,000	12/31/2013	1, 2, 4	Shallow Water and Marsh Habitat

Appendix A. Grant Projects Closed in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	Project End Date	ERP Goals Addressed	Type of Restoration Project
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-S20	M&T/Llano Seco Fish Screen Facility Short-Term Protection Project-Environmental Compliance	Ducks Unlimited	$542,640	6/30/2016	1, 2, 4	Fish Screens
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
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-02D-P54	Restoring Ecosystem Integrity in the Northwest Delta: Phase II	Solano Land Trust	$1,781,658	9/30/2013	1, 2, 4	Shallow Water and Marsh 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	$660,665	3/31/2014	1,2,4,5	River Channel Restoration

Appendix A. Grant Projects Closed in Year 14

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	Project End Date	ERP Goals Addressed	Type of Restoration Project
ERP-07D-S08	Sacramento Valley/Delta Fish Screen Program	Family Water Alliance	$4,525,636	12/31/2013	1 & 3	Fish Screens
ERP-08D-S03	San Joaquin River Dissolved Oxygen/Oxygen-consuming materials in San Joaquin River	University of the Pacific	$2,992,933	12/31/2013	1 & 6	Ecosystem Water and Sediment Quality
ERP-05-S23	Selby Creek Stream Habitat Restoration and Riparian Revegetation Project	Bioengineering Institute	$475,000	3/11/2014	4	River Channel Restoration
ERP-07D-P01	Suisun Marsh Land Acquisition and Tidal Marsh Restoration - Public Notification and Site Selection	Suisun Resource Conservation District	$16,500	6/30/2014	1 - 6	Shallow Water and Marsh Habitat
ERP-04D-S08c	Upper Sacramento River Basin Chinook Salmon Escapement Monitoring Program (USFWS)	U.S. Fish and Wildlife Service	$496,210	3/31/2014	1 & 3	At-Risk Species Assessment
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-09D-S05	Yuba City Fish Screen Project	City of Yuba City	$500,000	12/31/2013	1 & 3	Fish Screens

Appendix B. Grant Projects Active in Year 15

Appendix B. Grant Projects Active in Year 15

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	12/30/2015	4	Administrative or Program Support
ERP-11-S16	A Systems Biology Assessment of EDCs in the Delta	University of California, Davis	$486,411	1/31/2016	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	6/30/2016	1	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	3/31/2015	2 & 3	At-Risk Species Assessment
ERP-99-B01	Battle Creek Salmon and Steelhead Restoration Project	Bureau of Reclamation	$28,000,000	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	6/30/2017	1 - 4	Fish Passage
ERP-13D-S02	Battle Creek Salmon and Steelhead Restoration Project - Phase 2	Bureau of Reclamation	$12,000,000	12/31/20019	1 - 4	Fish Passage
ERP-07D-S05	Blacklock Restoration Project Monitoring	California Department of Water Resources	$382,250	To Be Determined	1, 2, 4, 6	Shallow Water and Marsh Habitat

Appendix B. Grant Projects Active in Year 15

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-13D-S04	BREWing Health 2: Improved sample collection for seasonal wetland MeHg flux	U.S. Geological Survey	$200,000	6/30/2017	6	Ecosystem Water and Sediment Quality
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	12/31/2015	1 & 3	Hydrodynamics, Sediment Transport, and Flow Regimes
ERP-07D-P04	Clover Creek / Millville Diversion Fisheries Restoration Project	Western Shasta RCD	$2,000,000	9/30/17	1 - 4	Fish Passage
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	7/31/2014	2 & 3	Local Watershed Stewardship

Appendix B. Grant Projects Active in Year 15

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
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
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

Appendix B. Grant Projects Active in Year 15

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
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-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	6/30/2015	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-13D-S06	Lindsey Slough Tidal Marsh Enhancement Project	California Wildlife Federation	$800,000	6/1/2017	1 - 4	Shallow Water and Marsh Habitat

Appendix B. Grant Projects Active in Year 15

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-11-S15	Linking Habitat and Spatial Variability to Native Fish Predation	University of California, Davis	$730,307	1/31/2016	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	To Be Determined	1 - 4, & 6	River Channel Restoration
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	$1,244,017	12/31/2015	1,2,4	Lowland Floodplains and Bypasses
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	$2,260,313	3/31/2016	1,2,5,6	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

Appendix B. Grant Projects Active in Year 15

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-11D-S20	M&T/Llano Seco Fish Screen Facility Short-Term Protection Project-Environmental Compliance	Ducks Unlimited	$542,640	6/30/2016	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	$489,343	9/30/2017	1 & 3	At-Risk Species Assessment
ERP-11-S07	McCormack-Williamson Tract Flood Control and Ecosystem Restoration Project	Reclamation District 2110	$3,314,300	To Be Determined	1 - 4	Shallow Water and Marsh Habitat
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-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-09D-S02	Sacramento-Central Valley Fish Screen Program	Family Water Alliance	$1,750,000	12/31/2016	1 & 3	Fish Screens

Appendix B. Grant Projects Active in Year 15

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
ERP-11-S11	Salinity effects on native and introduced SAV of Suisun Bay and the Delta	California State University, San Francisco Romberg Tiburon Center	$412,405	1/31/2015	1, 2, 4, 5	Shallow Water and Marsh Habitat
ERP-13D-S05	Suisun Marsh Land Acquisition	California Waterfowl Association	$940,952	6/30/2017	1 - 6	Shallow Water and Marsh Habitat
ERP-13D-S03	Supporting a Multi-Agency Fish Tracking Array in the Sacramento/San Joaquin Watershed	University of California, Davis	$2,837,386	2/28/2017	1 & 3	At-Risk Species Assessment
ERP-11-S04	Survival and Migratory Patterns of Juvenile Spring and Full Run Chinook Salmon in Sacramento River and Delta	University of California, Davis	$2,105,911	2/28/2015	1 & 3	At-Risk Species Assessment
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	$250,136	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

Appendix B. Grant Projects Active in Year 15

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	Project End Date	ERP Goals Addressed	Topic
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	Habitat and Wildlife Friendly Agriculture