Agenda Item 12
Attachment 1

Ecosystem Restoration Program

2014 Annual Summary

ECOSYSTEM RESTORATION PROGRAM

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

U.S. FISH & WILDLIFE SERVICE DEPARTMENT OF THE INTERIOR

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

Ecosystem Restoration Program
California Department of Fish and Wildlife
830 S Street
Sacramento, CA 95811

For more information, visit us at:
www.dfg.ca.gov/water/erp.html

Introduction

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.

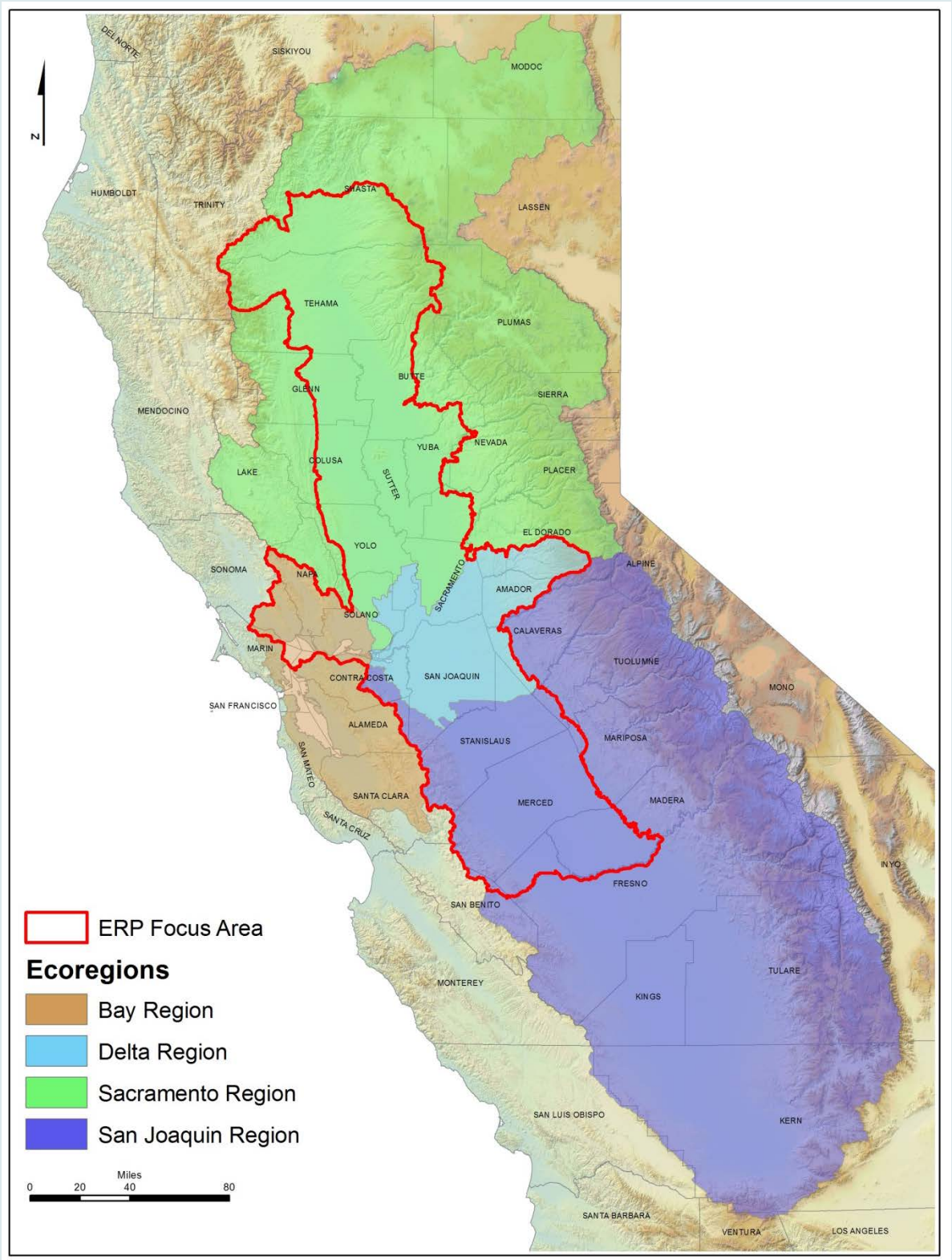
The ERP Focus Area includes the Delta, Suisun Bay, the Sacramento River below Shasta Dam, the San Joaquin River below the confluence with the Merced River, and other major tributary watersheds directly connected to the Bay–Delta ecosystem below major dams and reservoirs. Principle participants overseeing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

The following are the six strategic goals 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 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 Annual Report 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.

ERP Focus Area



Year 14 at a Glance

The ERP's principal activity is to fund and manage grant projects within the ERP Focus Area. Project funding is provided by State water bonds, as well as cost share from federal and local partners. Staff collaborates with federal, State, and local agencies on the development of regional planning efforts, conceptual models, monitoring programs, and performance measures within the ERP's adaptive management framework. Partners, including stakeholders and other State and federal agencies, are essential to accomplishing shared Delta ecosystem restoration visions and goals.

The following program elements and activities discussed in this report were conducted during ERP Year 14.

- **ERP Funding**
- **ERP Grant Program**
- **Year 14 Project Highlights**
- **ERP Conservation Strategy**
- **Adaptive Management**
- **Workshops**
- **Coordination**
- **Year 15 – What's Ahead**
- **ERP Projects Closed in Year 14**
- **ERP Projects Active in Year 15**

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

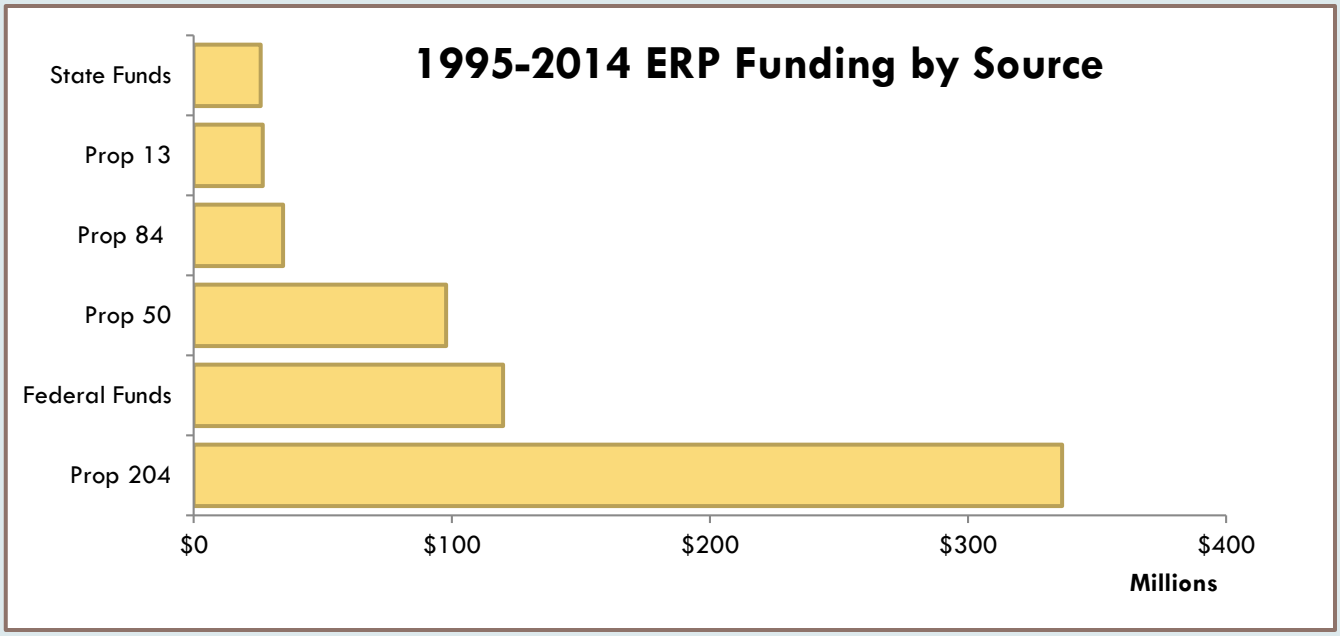
The primary sources of State funding for ERP projects and activities include the following:

- 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 to 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, the federal government provides funding to support various activities that contribute to 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.



ERP Grant Program

A principle activity of ERP is to implement projects within the Focus Area through grants administered by the ERP Grants Program. At the close of Year 14, ERP managed 65 projects, including 4 projects that initiated work and 21 projects completed during Year 14. Staff also worked to develop additional grants for Year 15. Below is a summary of projects funded by ERP from inception through Year 14. 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.

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**

Year 14 Project Highlights

BREACH III: Evaluating and Predicting 'Restoration Thresholds' in Evolving Freshwater-Tidal Marshes

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. In addition to the research created under the grant, the Breach III team created hydrodynamic, landscape and other models for Liberty Island functions and processes. Researchers funded by ERP presented the results of the landscape model to the restoration and management communities in a special workshop in June 2013. Before the end of 2014, a final synthesis report that ties together the various disciplines and predictive models will be prepared. 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. Click here for more information.

Mercury in San Francisco Bay-Delta Birds: Trophic Pathways, Bioaccumulation, and Ecotoxicological Risk to Avian Reproduction

The Bay-Delta watershed has a legacy of mercury contamination originating from both the mercury mined from the Coast Range and the mercury used to extract gold in the Sierra Nevadas. With the goal of better understanding mercury bioaccumulation as well as providing information that could be used in setting appropriate human and ecotoxicological endpoints, the Mercury in Birds in SF Bay Project was initiated. This project evaluates the affect mercury in the environment has on three guilds of birds (i.e., avocets, terns, and diving ducks). Each of these birds represents a unique component of the foodweb and foraging pathway within the Bay-Delta ecosystem for mercury bioaccumulation. From this study, we have learned:

- Some bird species are more sensitive than others to mercury in the environment.
- Mercury in the bird eggs studied is above the effects threshold for terns, rails, and other species.
- Slower growth in tern chicks is associated with mercury exposure.
- Mercury concentrations in SF Bay waterbirds (i.e., tern livers) are above levels associated with deleterious effects in other species.

Year 14 Project Highlights Continued

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*."

Complementing Water Planning Efforts for the Delta and Sacramento River: Application of the Ecological Flows Tool

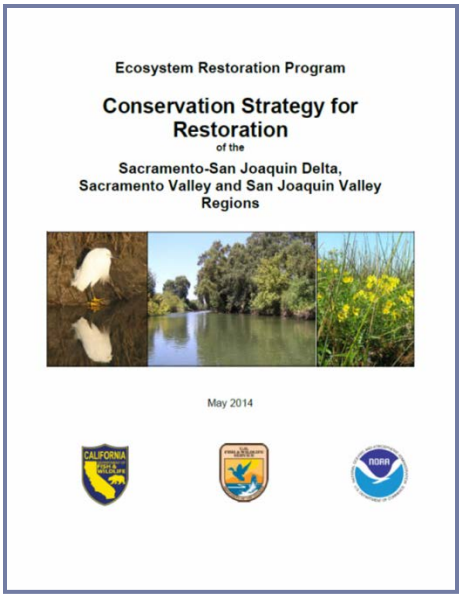
Output Viewer - Rollup View

Performance Measure	Description		Multi-Year Rollup	% Poor	% Fair	% Good
1a-Historical-T1, NoGravelAugmentation, NoRevetment						
CH - Fall - CH1	WUA Spawning - Fall Chinook	☐		5	39	56
CH - Late Fall - CH1	WUA Spawning - Late Fall Chinook	☐		23	32	45
CH - Spring - CH1	WUA Spawning - Spring Chinook	☐		16	24	60
CH - Winter - CH1	WUA Spawning - Winter Chinook	☐		12	28	60
ST1	WUA Spawning - Steelhead	☐		19	40	41
2a-Historical-T1, GravelAugmentation, NoRevetment						
CH - Fall - CH1	WUA Spawning - Fall Chinook	☐		5	32	63
CH - Late Fall - CH1	WUA Spawning - Late Fall Chinook	☐		23	26	51
CH - Spring - CH1	WUA Spawning - Spring Chinook	☐		9	21	70
CH - Winter - CH1	WUA Spawning - Winter Chinook	☐		7	25	68
ST1	WUA Spawning - Steelhead	☐		7	19	74

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. 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 are tied to a variety of ecosystem functions for representative sets of focal species and habitats. 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.

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.


Ecosystem Restoration Program

Conservation Strategy for Restoration
of the
Sacramento-San Joaquin Delta, Sacramento Valley and San Joaquin Valley Regions

May 2014

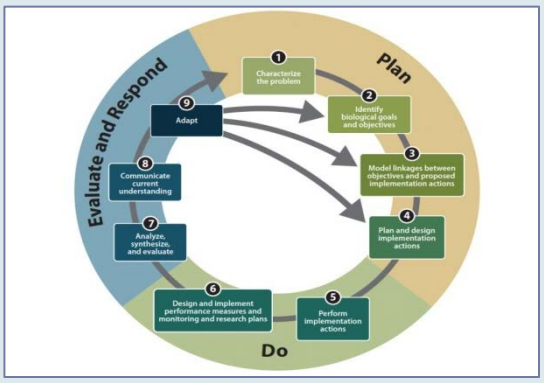
To create the ERP Conservation Strategy, ERP staff incorporated lessons learned during Stage 1 of the CALFED Bay-Delta Program, used best available science on current ecological conditions, reviewed related programs and planning efforts, and sought input from stakeholders and the public. It identifies ERP goals, conservation priorities and species-specific conservation actions for Stage 2 of ERP (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.

The ERP Conservation Strategy was released along with NOAA's National Marine Fisheries Service (NMFS) Final Recovery Plan for ESA-listed Central Valley Chinook Salmon and Steelhead, the announcement of CDFW funding for recovery implementation, and the Central Valley Wild Salmon and Steelhead Agreement on July 22nd 2014. Click here for more information.

Adaptive Management

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. 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, 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 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 (See diagram below). This represents an important component of the ongoing effort to foster more efficient and effective implementation of habitat restoration and water management.



A Nine-step Adaptive Management Framework

The shading represents the three broad phases of adaptive management (Plan, Do, then Evaluate and Respond), and the boxes represent the nine steps within the adaptive management framework. The circular arrow represents the general sequence of steps. The additional arrows indicate possible next steps for adapting (e.g., revising the selected action based on what has been learned).

Conceptual Model Development and Action Evaluation Process

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, and a scientific evaluation process to assess outcomes of proposed restoration actions in the Delta. 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 Delta Science Program, and other interested parties, to refine and further develop conceptual models of relevance to resource management in the Delta.

Workshops

State of the Science Workshop on Fish Predation on Central Valley Salmonids in the Bay-Delta Watershed

ERP and the Delta Science Program (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.

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.

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.

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.

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.

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 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 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 actively coordinated with AFRP on restoration activities including providing support for the State Habitat Restoration Coordinators (HRC) agreement with USFWS, who participate in quarterly AFRP HRC meetings, provide input on project prioritization, and annual work plans. In addition, ERP 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.

NOAA Fisheries Central Valley Salmon and Steelhead Recovery Planning

In 2001, NOAA Fisheries' recovery planning process for federally listed anadromous salmonids in the Central Valley formed 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.

Coordination continued

Delta Stewardship Council

During Year 14, ERP provided input to the DSP in their development of the Delta Science Plan. The Delta Science Plan addresses the Delta's policy and management issues through a shared approach for organizing and integrating ongoing scientific research, monitoring, data management, analysis, synthesis, and communication. ERP 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 also served on the planning committees for the DSP workshops on delta outflows and related stressors and interior delta flows and related stressors.

California Water Quality Monitoring Council

A key recommendation of the California Water Quality Monitoring Council (CWQMC) is to provide public access to water quality and ecosystem information that 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 to provide a single, global access point to a set of theme-based internet portals. ERP participated in workgroups addressing issues relevant to aquatic ecosystem health. ERP assisted the workgroup in developing the 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.

Delta Conservancy

ERP 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 Tracking Database will meet the collective needs for sharing project information, tracking project progress, evaluating performance measures, and informing management decisions.

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).

Looking Ahead

ERP continues to implement projects that align with the ERP goals, furthermore the majority of the activities identified as Year 14 activities will continue in Year 15. The following program elements and activities are expected to begin and continue in Year 15:

- **Grant Program -** ERP will manage approximately 44 grants, consisting of ongoing and new grants, as well as work to develop additional grants.
- **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.
- **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. 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 as a venue for communicating scientific information and improved understanding developed through ERP activities to diverse audiences.
- **Coordination -** ERP staff will continue to coordinate with other efforts and programs including the CWQMC, CVRWQCB, CVPIA, Delta Conservancy, Delta Stewardship Council, and the Delta Vision Foundation.

ERP Grant Projects Completed in Year 14

At-Risk Species Assessment

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
ERP-11D-S18	Expanding Fish Tracking Array with Real-Time Monitoring of Tagged Sturgeon and Salmonids	University of California, Davis	$420,392	1 & 2
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	1, 2, 3, 5
ERP-04D-S08c	Upper Sacramento River Basin Chinook Salmon Escapement Monitoring Program (USFWS)	U.S. Fish and Wildlife Service	$496,210	1 & 3

Ecosystem Water and Sediment Quality

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
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	1, 3, 6
ERP-08D-S03	San Joaquin River Dissolved Oxygen/Oxygen-consuming materials in San Joaquin River	University of the Pacific	$2,992,933	1 & 6
ERP-11-S10	Wetland and Rice Management to Limit Methylmercury Production and Export	U.S. Geological Survey	$197,416	6

ERP Grant Projects Completed in Year 14

Fish Passage

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
ERP-10D-S01	Fish Passage Improvement Program	California Department of Water Resources	$1,307,000	1 & 3

Fish Screens

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
ERP-02-P09-D	American Basin Fish Screen and Habitat Improvement Project	Natomas Mutual Water Company	$12,600,000	1 – 4
ERP-11D-S20	M&T/Llano Seco Fish Screen Facility Short-Term Protection Project-Environmental Compliance	Ducks Unlimited	$542,640	1, 2, 4
ERP-07D-S08	Sacramento Valley/Delta Fish Screen Program	Family Water Alliance	$4,525,636	1 & 3
ERP-09D-S05	Yuba City Fish Screen Project	City of Yuba City	$500,000	1 & 3

Hydrodynamics, Sediment Transport, and Flow Regimes

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
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	1 – 6

ERP Grant Projects Completed in Year 14

Local Watershed Stewardship

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
ERP-05-S34	Delta Working Landscapes	Delta Protection Commission	$800,000	1, 4, 6
ERP-05-S26	Fish Friendly Farming Environmental Certification Program	California Land Stewardship Institute	$1,000,243	1, 4, 5, 6

River Channel Restoration

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
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	1, 2, 4
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	1,2,4,5
ERP-05-S23	Selby Creek Stream Habitat Restoration and Riparian Revegetation Project	Bioengineering Institute	$475,000	4

ERP Grant Projects Completed in Year 14

Shallow Water and Marsh Habitat

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Expended)	ERP Goals Addressed
ERP-04D-S18	BREACH III: Evaluating and Predicting 'Restoration Thresholds' in Evolving Freshwater-Tidal Marshes	U.S. Fish and Wildlife Service	$2,447,998	1, 2, 4, 6
ERP-10D-P01	IRWM Fish and Productivity Data Analysis and Interpretation	Association of Bay Area Governments	$420,000	1, 2, 4
ERP-02D-P54	Restoring Ecosystem Integrity in the Northwest Delta: Phase II	Solano Land Trust	$1,781,658	1, 2, 4
ERP-07D-P01	Suisun Marsh Land Acquisition and Tidal Marsh Restoration - Public Notification and Site Selection	Suisun Resource Conservation District	$16,500	1-6

ERP Grant Projects Active in Year 15

At-Risk Species Assessment

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-06D-S18	Anadromous Fish Habitat Monitoring for the Battle Creek Salmon & Steelhead Restoration	U.S. Fish and Wildlife Service	$3,360,000	2 & 3
ERP-04-S10	Butte Creek Spring-run Chinook Salmon Life History Investigation	California State University, Chico Research Foundation	$291,661	1 & 3
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	1
ERP-11-S12	Evaluation of Floodplain Rearing and Migration in the Yolo Bypass	California Department of Water Resources	$878,020	1, 2, 4
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	1 & 2
ERP-11-S05	Managing Natural Resources for Adaptive Capacity: the Central Valley Chinook Salmon Portfolio	University of California, Berkeley	$489,343	1 & 3
ERP-13D-S03	Supporting a Multi-Agency Fish Tracking Array in the Sacramento/San Joaquin Watershed	University of California, Davis	$2,837,386	1 & 3
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	1 & 3
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	6

ERP Grant Projects Active in Year 15

Ecosystem Water and Sediment Quality

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-11-S16	A Systems Biology Assessment of EDCs in the Delta	University of California, Davis	$486,411	1 & 6
ERP-13D-S04	BREWing Health 2: Improved sample collection for seasonal wetland MeHg flux	U.S. Geological Survey	$200,000	6
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	4 & 6
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	6
ERP-11D-S21	Groundwater Monitoring Plan for the Lake Davis Pike Eradication Project	California Department of Fish and Wildlife	$49,000	5

ERP Grant Projects Active in Year 15

Estuary Foodweb Productivity

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
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	1-4

Fish Passage

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-99-B01	Battle Creek Salmon and Steelhead Restoration Project	Bureau of Reclamation	$28,000,000	1, 2, 4
ERP-08D-S04	Battle Creek Salmon and Steelhead Restoration Project - Phase 1A	Bureau of Reclamation	$14,812,500	1-4
ERP-13D-S02	Battle Creek Salmon and Steelhead Restoration Project - Phase 2	Bureau of Reclamation	$12,000,000	1-4
ERP-07D-P04	Clover Creek / Millville Diversion Fisheries Restoration Project	Western Shasta RCD	$2,000,000	1-4

ERP Grant Projects Active in Year 15

Fish Screens

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-09D-S03	American Basin Fish Screen and Habitat Improvement (Phase IV-Construction) Project	Natomas Mutual Water Company	$9,000,000	1
ERP-11D-S01	M&T/Llano Seco Fish Screen Facility Long-Term Protection Project (Phase IV)	Ducks Unlimited	$2,480,610	1, 2, 4
ERP-11D-S20	M&T/Llano Seco Fish Screen Facility Short-Term Protection Project-Environmental Compliance	Ducks Unlimited	$542,640	1, 2, 4
ERP-09D-S02	Sacramento-Central Valley Fish Screen Program	Family Water Alliance	$1,750,000	1 & 3
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	1 & 3

Upland Habitat and Wildlife Friendly Agriculture

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-12D-S03	Working Waterways Program	Yolo County Resource Conservation District	$643,936	1-4
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	4

ERP Grant Projects Active in Year 15

Hydrodynamics, Sediment Transport, and Flow Regimes

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-07D-P05	Clear Creek Environmental Water Program	U.S. Fish and Wildlife Service	$813,745	1 & 3

Local Watershed Stewardship

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-13D-S01	Delta Dialogues, Phase II	Sacramento-San Joaquin Delta Conservancy	100,800	2 & 3
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	1 & 3

Lowland Floodplains and Bypasses

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-11-S06	Lower Cosumnes River Floodplain Restoration Project	Ducks Unlimited	$1,244,017	1,2,4
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, 2, 4, 6
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	1, 3, 4

ERP Grant Projects Active in Year 15

Mine Remediation

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-11-S19	Corona and Twin Peaks Mine Drainage Treatment Project	Tuleyome, Inc.	$1,530,550	6

Non-Native Invasive Species

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-11-S15	Linking Habitat and Spatial Variability to Native Fish Predation	University of California, Davis	$730,307	1-3

River Channel Restoration

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-11-S09	Lower Clear Creek Aquatic Habitat and Mercury Abatement Project	Western Shasta Resource Conservation District	$4,539,015	1 - 4, & 6
ERP-05D-S18	Lower Clear Creek Floodway Rehabilitation Project (Phase 3B)	Western Shasta Resource Conservation District	$3,482,451	1-4
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	1,2,5,6

ERP Grant Projects Active in Year 15

Shallow Water and Marsh Habitat

ERP Project ID	Project Title	Grantee	Project Cost (Total Amount Awarded)	ERP Goals Addressed
ERP-07D-S05	Blacklock Restoration Project Monitoring	California Department of Water Resources	$382,250	1, 2, 4, 6
ERP-07D-P03	Hill Slough West Restoration Project, Phase I - Preliminary Restoration Design, Environmental Documentation and Permitting	California Wildlife Foundation	$646,642	1, 2, 4
ERP-11-S14	Identifying habitat characteristics that support native fish in the Delta and Suisun Marsh	University of California, Davis	$1,152,195	1-4
ERP-13D-S06	Lindsey Slough Tidal Marsh Enhancement Project	California Wildlife Federation	$800,000	1-4
ERP-11-S08	Management Tools for Landscape-Scale Restoration of Ecological Functions in the Delta	Aquatic Science Center	$875,000	1, 2, 4
ERP-11-S07	McCormack-Williamson Tract Flood Control and Ecosystem Restoration Project	Reclamation District 2110	$3,314,300	1-4
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, 2, 4, 5
ERP-13D-S05	Suisun Marsh Land Acquisition	California Waterfowl Association	$940,952	1-6