

Fish Restoration Program

# Annual Report

January 2015 through December 2015

A joint program between California Department of Water Resources and California Department of Fish and Wildlife.

April 2016



Cover: Prospect Island, Sacramento River Deep Water Ship Channel, and Liberty Island (Photo Credit: Dale Kolke)

# Fish Restoration Program Annual Report

January 2015 through December 2015

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California Natural Resources Agency  
**John Laird, Secretary for Natural Resources**

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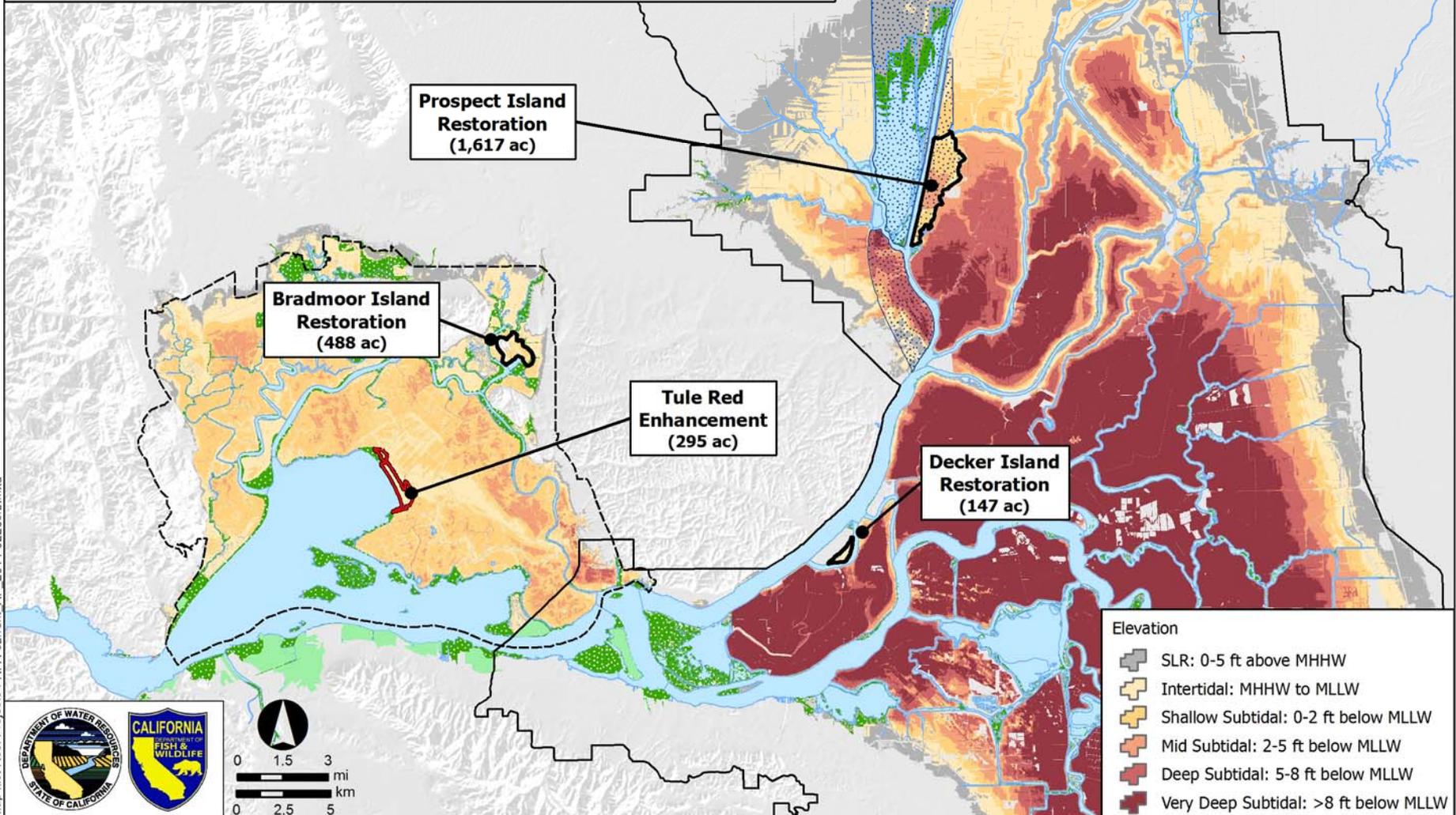
# PLANNED FRP AND OTHER TIDAL HABITAT RESTORATION PROJECTS FOR BiOps AND ITP COMPLIANCE

## Tidal Restoration Projects\*

-  Fish Restoration Program (Department of Water Resources and Department of Fish and Wildlife)
-  State and Federal Contractors Water Agency (SFCWA)

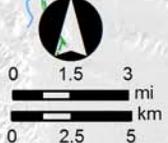
-  Yolo Bypass
-  Legal Delta
-  Suisun Protection Plan Boundary
-  Tidal Marsh
-  Muted Tidal Marsh
-  Tidal Waters

\*Listed acreage reflects property boundaries and not amount to be credited



- ### Elevation
-  SLR: 0-5 ft above MHHW
  -  Intertidal: MHHW to MLLW
  -  Shallow Subtidal: 0-2 ft below MLLW
  -  Mid Subtidal: 2-5 ft below MLLW
  -  Deep Subtidal: 5-8 ft below MLLW
  -  Very Deep Subtidal: >8 ft below MLLW

Map file: Rest-Projects-FRPA-current\_AP\_2014-0226srp.mxd



Sources: Topography: Suisun (DWR 2005), Delta (DWR 2007), Lower Yolo (SFCWA 2011);  
 Tidal Marsh: Suisun (SFEI 1998 - WWR mod 2013), Delta (CDFW 2007, BDCP 2012 - WWR mod 2013);  
 Tidal Waters (CDFW 2005 and BDCP 2012 - WWR 2013); Yolo Bypass (URS 2007 - WWR mod 2010);  
 Restoration Sites (DWR 2011, WWR 2013)

Map produced by SWS: January 2016

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## **1. Introduction**

The Fish Restoration Program Agreement (FRPA), between the California Department of Fish and Wildlife (CDFW) and the Department of Water Resources (DWR), was signed on October 18, 2010. The FRPA addresses specific habitat restoration requirements of the US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) Biological Opinions (Biological Opinions) for the State Water Project (SWP) and Central Valley Project (CVP) operations. The FRPA is also intended to address the habitat requirements of the CDFW Longfin Smelt Incidental Take Permit (ITP) for SWP Delta operations.

The primary objective of the Fish Restoration Program (FRP) is to implement the fish habitat restoration requirements and related actions of the Biological Opinions and the ITP in the Delta, Suisun Marsh, and Yolo Bypass. Restoration efforts are focused on intertidal and associated subtidal habitats to benefit Delta Smelt, Longfin Smelt, and salmonids.

This report covers activities between January 2015 and December 2015.

## **2. Progress Towards Meeting Regulatory Requirements**

### **2.1 USFWS Delta Smelt Biological Opinion RPA 4**

Reasonable and Prudent Action (RPA) 4 of the USFWS Delta Smelt Biological Opinion requires the creation or restoration of a minimum of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh. Projects that partially satisfy RPA 4 may also be applicable towards additional regulatory requirements (see sections 2.3 and 2.5).

#### **2.1.1 Prospect Island**

##### **2.1.1.1 Restoration**

Prospect Island is located in the Cache Slough Complex at the confluence of Miner Slough and the Sacramento Deep Water Ship Channel. DWR acquired the northern three-quarters of Prospect Island in 2010, and the remainder of the island from the Port of West Sacramento (the Port) in August 2015, with the goal of creating tidal wetlands pursuant to RPA 4. The restoration of Prospect Island is expected to provide habitat for native fish and enhance the food web both onsite and within the adjacent Cache Slough Complex. Restoration of Prospect Island will likely also partially satisfy habitat restoration acreage requirements in the NMFS Salmonid Biological Opinion Action 1.6.1 (section 2.3).

Three alternative restoration designs were analyzed for the Environmental Impact Report (EIR). All alternatives involve the use of wide breaches, the excavation of central dendritic channels,

and the construction of an intertidal toe berm along the interior Miner Slough levee. One alternative maintains access for a private property owner adjacent to the island. In this alternative, the southern cross levee will remain intact and the two portions of the island will remain hydrologically distinct.

The administrative draft EIR was revised heavily in 2015 based on several revisions to construction details in the Project Description. In May 2015, FRP staff met with USFWS, NMFS, and the U.S. Army Corps of Engineers (USACE) to discuss the updated project description and ensure any issues the Federal Agencies had were addressed. The revised Administrative Draft EIR is expected to be finalized in spring of 2016, and a public draft of the EIR is scheduled to be released in summer of 2016.

#### ***2.1.1.2 Permitting***

On January 22, 2015, FRP staff met with the Central Valley Flood Protection Board (CVFPB) and provided a general description of all activities being conducted under CVFPB jurisdiction. CVFPB requires the proposed project be modeled for 100 and 200-year storm events. This modeling is pending selection of a project alternative for construction.

In September 2015, FRP staff submitted permit applications necessary for geotechnical exploration and sediment characterization that will help inform the engineering design of the restoration project. All but one of the samples in the northern part of the island was collected by the end of 2015; the remaining samples will be collected by February 2016.

#### ***2.1.1.3 Groundwater Monitoring Study***

DWR North Central Region Office has completed their site characterization and groundwater monitoring study, which began in January 2010. The final project report was completed in the early part of 2014 and is available on the FRP website [[http://www.water.ca.gov/environmentalservices/frpa\\_prospect\\_restoration.cfm](http://www.water.ca.gov/environmentalservices/frpa_prospect_restoration.cfm)].

Staff continues to monitor the 20 groundwater wells and one surface water stage installed on Prospect Island, and nine groundwater wells and three surface water stages on Ryer Island. Wells are checked twice each month.

#### ***2.1.1.4 Land Management***

DWR continues to clear vegetation on the Miner Slough levee, using a combination of boom mowers and goat herds, to facilitate levee inspections. Priority levee repair sites are monitored to ensure they do not become critical, and small repairs are conducted as needed. A larger Miner Slough levee repair effort is described in Section 3.1.3.

Two small diameter pipes underneath the levee crown, which extended from Miner Slough to landside of the levee, were allowing water at high tide to cause erosion damage on the landside of the levee. Contractors filled the pipes in January 2015 to prevent further damage.

Vegetation on the crown and upper slopes of the Miner Slough levee along Prospect Island was cleared between February and April 2015, under terms and conditions set forth in a Routine Maintenance Agreement issued by CDFW. In February, 1200 head of goats were brought on the island to graze and continue clearing vegetation on levee slopes.

DWR acquired the southern portion of Prospect Island from the Port in August 2015. The levees have not been maintained in quite some time. To facilitate an inspection of this levee, a California Conservation Crew began to manually clear the vegetation from the levee crown in mid-November 2015. Work will continue in 2016 until the Miner Slough levee, from the southern cross levee to the old levee breach site, is cleared.

DWR is coordinating with PG&E to facilitate the removal of power poles and a transmission tower in conjunction with the restoration work. After these facilities are removed, PG&E easements on the property will be cleared.

#### ***2.1.1.5 Reactivation of Reclamation District 1667***

The Prospect Island Reclamation District (RD) 1667 was reactivated in 2014 to maintain the levees efficiently and effectively. RD 1667 became inactive in 1995, when U.S. Bureau of Reclamation (USBR) purchased the upper two-thirds of Prospect Island from the Sakata Brothers. DWR acquired the Prospect Island property from USBR in January 2010, and went on to purchase the 309 acres at the southern end of the island from the Port in August 2015. Presently, all the lands within the RD 1667 boundary are owned by DWR. The RD meets the third Friday of every month to review the monthly levee inspection reports and discuss routine maintenance and property management issues.

### **2.1.2 Decker Island**

#### ***2.1.2.1 Restoration***

Decker Island is located on the Sacramento River, in the corridor between Suisun Marsh and the Cache Slough Complex. DWR acquired about 140 acres of the southeast portion of Decker Island along Horseshoe Bend, in August 2015 for tidal habitat restoration. The restoration is expected to benefit Delta Smelt and salmonids, and partially satisfy habitat restoration acreage requirements of both RPA 4 and NMFS Salmonid Biological Opinion Action 1.6.1 (section 2.3).

Restoration planning kicked off in June of 2015 with creation of goals and objectives, preliminary project timeline, and conceptual restoration design features. Bathymetry and LiDAR surveys were conducted to provide site elevation data for hydrodynamic modeling. A cultural resource survey was conducted in June 2015, and vegetation surveys were conducted throughout the summer, to assess what resources have the potential to be present on the project site and to provide information to support environmental documentation.

A range of restoration design scenarios was selected to be evaluated based on projected construction impacts and hydrodynamic outcomes. All alternatives involve a breach at the southern end of the property and removal of interior berms to improve tidal hydrology on the site. Other alternatives include breaching or lowering the northern levee to mean tide level with potential addition of starter channels or a flow-through channel. Hydrodynamic modeling to analyze restoration alternatives was completed in December 2015, and will be used to choose a project design to be analyzed under the California Environmental Quality Act. We expect to review the modeling results and choose a project design in January of 2016.

#### ***2.1.2.2 Permitting***

A Preliminary Wetland Delineation for the project site was completed in December 2015. This was provided to the USACE for approval, and will be used to inform pre-application meetings with permitting agencies in early 2016.

#### ***2.1.2.3 Land Management***

DWR conducted vegetation clearing along the property boundary to allow the adjacent landowner's grazing lessee access to fix their fence. A remaining section of fence will be cleared and repaired in early 2016 before cattle can be excluded from DWR's property.

### **2.1.3 Bradmoor Island**

#### ***2.1.3.1 Restoration***

Bradmoor Island Tidal Restoration Project, previously referred to as the Overlook Club (Property 322) Tidal Restoration Project, is located within the Nurse Slough Complex of Suisun Marsh, Solano County, California. Bradmoor Island includes 730 acres of managed wetlands, tidal berms, and associated uplands. DWR purchased the 245-acre Overlook Club in February 2013 for tidal habitat restoration and is pursuing acquisition of the 257-acre Flying D Club (Property 329).

The Overlook Club is currently maintained as a managed wetland, primarily for waterfowl habitat and recreational hunting, as are the two adjacent properties. DWR is maintaining the property to continue these beneficial uses while taking actions to control invasive species in

order to prepare the property for restoration. Bradmoor Island is a unique feature within the Suisun Marsh due to the presence of a hill in the central portion of the island and its proximity to Little Honker Bay, which may provide a local sediment source to the property once it is restored. Overlook Club consists of approximately 36 acres of upland grassland, currently used for cattle grazing; 33 acres of tidal berm; and 156 acres of managed wetland, including open water features. The remaining area includes the levees, roads, and navigable waters (existing dredger cuts in the tidal berm).

Restoration of the property was initially planned for 2016, but will be delayed one to three years to allow for ongoing real estate negotiations with the neighboring properties on Bradmoor Island. Restoring the properties together would allow for greater connectivity and substantial cost savings, and would reduce the need to fill wetlands to reinforce interior levees. DWR is developing alternatives to restore the whole island or only the portion already purchased. Restoration will partially satisfy the requirements under the Biological Opinions and the ITP (section 2.5) for the FRP, and the Suisun Marsh Habitat Management, Preservation, and Restoration Plan.

#### **2.1.3.2 Land Management**

DWR developed an interim land management plan for the property that identified potential tasks to be carried out under existing permits to improve wildlife habitat and create features that will be beneficial to fish following restoration of tidal action. DWR sprayed *Lepidium latifolium* patches in June 2015 and dried out the site beginning in March 2015. A cycle of spraying and mowing the invasive *Phragmites australis* was completed in September 2015. DWR plans to continue these management activities annually until restoration occurs.

#### **2.1.3.3 Monitoring**

DWR is developing a plan to monitor the effects of the restoration project. DWR is collaborating with CDFW to monitor fish and food productivity of the restoration site, and is developing a plan to monitor changes in use by wildlife as the conditions change. DWR and CDFW conducted salt marsh harvest mouse surveys in August 2015 and confirmed presence at the site.

#### **2.1.4 Restoration Project Proposal Solicitation**

DWR is developing a process for a FRP Habitat Restoration Request for Proposals Secondary (RFPII), wherein private and government entities would acquire property and develop and implement tidal habitat restoration projects that meet DWR criteria. DWR began discussions with the U.S. Bureau of Reclamation (USBR) to develop a joint, cost-shared process for soliciting proposals and awarding contracts. DWR and USBR staff met on several occasions to develop a Memorandum of Understanding (MOU) between the two agencies, which should be finished in

2016. DWR drafted the program sections of a DWR FRP RFPII, including evaluation criteria and progress payment schedules, which have been reviewed once by fishery agencies.

Next steps are to finalize the MOU with USBR and develop a financial agreement that stipulates how USBR would provide funds for the cost share in a subsequent DWR-USBR RFPII. For the current DWR RFPII, the California Natural Resources Agency and DWR Legal will meet with Department of General Services (DGS) to work out final issues, including contract type and progress payments. Then, DWR will prepare the full RFPII Solicitation Package, begin solicitation in spring 2016, and award contracts in fall 2016.

## **2.2 NMFS Salmonid Biological Opinion Action 1.2.6**

RPA Action 1.2.6 requires DWR to provide funds to the Battle Creek Salmon and Steelhead Restoration Project (Battle Creek Project), pursuant to the FRPA.

The FRPA Amendment 1, signed on November 15, 2010, clarifies that the Battle Creek Project will be paid with a \$12 million fixed cost, payable over two consecutive fiscal years. DWR provided a total of \$12 million to the Battle Creek Project at the direction of CDFW pursuant to FRPA in 2011 and 2012.

DWR requested that NMFS concur that the transfer of the \$12 million to CDFW and USBR has fully satisfied all of its legal obligations under Action 1.2.6 of the Biological Opinion. NMFS responded in a letter dated May 6, 2013 that they do not agree that compliance has been met. DWR's Office of the Chief Counsel and DWR Executive are now considering this matter. As of December 2015, FRP had not received an update.

## **2.3 NMFS Salmonid Biological Opinion Action 1.6.1**

Action 1.6.1 requires the restoration of floodplain rearing habitat for juvenile winter-run and spring-run Chinook Salmon and Central Valley Steelhead in the lower Sacramento River basin. Action 1.6.1 is addressed in the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Draft Environmental Impact Statement/EIR, which is currently being developed by DWR and USBR.

FRP tidal habitat restoration projects may count toward partial fulfillment of Action 1.6.1. As stated in the NMFS Biological Opinion, "The USFWS's Delta Smelt Biological Opinion includes an action to restore 8,000 acres of tidal habitat for the benefit of Delta Smelt. If these 8,000 acres also provide suitable rearing habitat for salmonids, they may be used in partial satisfaction of the objective of this action."

FRP expects that the Prospect, Decker, and Bradmoor Island restoration projects will apply toward both USFWS RPA 4 and NMFS Action 1.6.1. Please see Section 2.1 for details on these restoration projects.

#### **2.4 NMFS Salmonid Biological Opinion Action 1.6.2**

On October 10, 2012, DWR submitted the FRP Implementation Strategy to NMFS as fulfillment of the “Liberty Island/Lower Cache Slough enhancement plan” that is required by RPA Action 1.6.2. As of 2015, DWR had not gotten a response.

#### **2.5 CDFW Longfin Smelt ITP**

Habitat restoration required by the ITP aims to improve overall habitat quality for Longfin Smelt in the Bay Delta Estuary through the acquisition and restoration of 800 acres of inter-tidal and associated sub-tidal wetland habitat in a mesohaline part of the estuary. Projects that fulfill restoration requirements under the ITP may also count towards the 8,000 acre requirement of the USFWS Biological Opinion RPA 4 (section 2.1), as outlined within the FRP Agreement (section A.3.d). Properties 322 and 329 on Bradmoor Island could satisfy up to 500 acres of habitat. Other properties within the Suisun Marsh are being pursued to satisfy the remainder of the 800 acres of mesohaline habitat and the greater 8,000 acres requirement.

Other requirements within the ITP include developing site-specific management and monitoring plans appropriate to improve habitat conditions for Longfin Smelt, connecting restored areas to tidal marsh corridors, and allowing for natural transitions to adjacent sub-tidal, marsh, and upland habitats in restoration designs. The FRP Monitoring Team continues to work on site specific tidal wetland monitoring plans, conceptual models, and pilot monitoring that will help guide the successful monitoring of wetland restoration projects (Section 3.1.2).

### **3. Other Activities**

#### **3.1 FRP Project Teams**

##### **3.1.1 Outreach**

Successful implementation of the FRP’s restoration goals will involve extensive outreach efforts to keep stakeholders and interested agencies apprised of the FRP’s progress and plans. To date, such efforts include the development and maintenance of a FRP website, quarterly e-News updates through a FRP listserv, several informational pamphlets, and meetings with various stakeholders.

The FRP website provides a general overview of the program and serves as a public-accessible depository for all documents that are relevant to the program’s efforts. Current content

includes (but is not limited to) the Fish Restoration Program Agreement, the Implementation Strategy and other associated FRP documents such as fact sheets, frequently asked questions, program location maps, communication plans, and a stakeholder assessment. The website contains links to each separate restoration project under the FRP. The website also provides a means by which the public can contact the FRP staff.

Stakeholders and members of the public can request to be a member of the FRP listserv. These updates provide the public with general updates of the program and are also a way to announce significant events such as the release of the Notice of Preparation for the Prospect Island restoration project.

### **3.1.2 Monitoring**

Biological Opinions for the SWP and CVP require the development and implementation of a monitoring program to assess the effectiveness of the restoration program in providing benefits to listed fish species, and to facilitate adaptive management of restoration activities. The CDFW FRP monitoring team, established in 2014, is committed to objective, science-based monitoring of fishes and their food web in sites restored through the FRP. Monitoring-related activities in 2015 comprised planning, coordination and consultation, gear testing, and preliminary baseline monitoring.

The FRP monitoring team continued to lead the Interagency Ecological Program (IEP) Tidal Wetlands Monitoring Project Work Team. Activities in 2015 focused on the further development of a standardized framework for tidal wetland monitoring in the Delta. The intent in using a common framework is to increase data comparability across projects and provide more power to detect effects of restoration. The draft “Tidal Wetland Monitoring Framework for the Upper San Francisco Estuary” (framework) was extensively revised this year based on discussions of the work team. The FRP monitoring team accordingly revised the preliminary monitoring plan for the Prospect Island Project to reflect the hypotheses and metrics included in the framework.

Biological monitoring of shallow tidal areas is uniquely challenging, and many sampling methods exist. Before settling on standardized fish and invertebrate sampling methods for recommendation in the framework, the FRP monitoring team began to compare methods and gears through pilot work in 2015. In July 2015, the IEP extended Delta Smelt incidental take coverage for phase I of the pilot work. From July through October 2015, several methods for collecting macroinvertebrates and larval, juvenile, and adult fish were qualitatively explored. In this work, the monitoring team collaborated with personnel from the USFWS Liberty Island studies and UC Davis’ North Delta Arc project to minimize duplication of sampling efforts. Limited pre-restoration (baseline) data on invertebrates and fishes were collected in the Cache Slough area (Lindsey Slough, Miner Slough, Cache Slough, and Liberty Island). The team

developed databases to house these data, as well as metadata standards, which will be applied to all future monitoring. At the conclusion of phase I field work, a subset of the tested gears was chosen for further evaluation, based on diversity and density of catches during phase I, and on ease and consistency of gear deployment. The plan to more rigorously compare these gears through more intensive and spatially extensive sampling in winter-spring 2016 was approved by the IEP in December 2015.

In addition to planning for monitoring of Prospect Island, the monitoring team conducted site visits to future FRP restoration sites: Decker Island, and Bradmoor Island. The team also visited other sites pending restoration and sites under consideration for context monitoring. Standardized monitoring methods now in development by the FRP team will be used in the preparation of site-specific monitoring plans for all FRP projects.

### **3.1.3 Miner Slough Levee Repair**

A levee inspection in February 2013 revealed twenty-five sites along Prospect Island's Miner Slough levee that require repair due to damage from beaver activity, erosion, and lack of bank protection or waterside vegetation to prevent further erosion. These sites have been regularly monitored to insure their condition does not become critical. FRP staff continues to work with DWR's Division of Engineering on work plans for the repair of these sites.

Biological Assessments (BA) and Nationwide Permit (NWP 3) applications were submitted to USACE for species under the jurisdiction of NMFS (Green Sturgeon, Steelhead, winter-run and spring-run Chinook Salmon) and the USFWS (Delta Smelt, Giant Garter Snake, and Valley Elderberry Longhorn Beetle) on February 18, 2014. A Biological Opinion was received from USFWS on August 11, 2014. The NMFS did not agree with FRP's findings and on July 11, 2014 issued a non-concurrence letter stating that the project is likely to adversely affect listed species. With the assistance of CDFW biologists, a revised BA was resubmitted to NMFS through the USACE on January 13, 2015. On January 22, 2015, the USACE requested formal consultation from NMFS. We received the Biological Opinion from NMFS August 28, 2015. USACE determined that a permit under section 14 of the Rivers and Harbors Act of 1899 (section 408 permit) would also be required and this forced CVFPB to re-open the permit application. The CVFPB originally determined that the project was not within their jurisdiction; however, after resubmitting the document, they are requiring an encroachment permit. DWR is in the process of gaining this approval. At this time, DWR is waiting for CVFPB encroachment permit, as well as 408 and 404 permits from the USACE.

### **3.1.4 Property Acquisition**

FRP continues to work with DWR's Real Estate Branch to evaluate the suitability of potential new properties in the Delta and Suisun Marsh for restoration.

DWR purchased the Port's holdings on Decker and Prospect Islands in August 2015. DWR came to an agreement to purchase club 329 on Bradmoor Island and was in escrow as of the end of 2015. Real Estate Branch has requested and received appraisals for two parcels in the Suisun Marsh (parcels 604 and 330) and has entered into negotiations with the owners.

FRP is negotiating with landowners to potentially purchase eleven other properties in the Delta and Suisun Marsh. However, due to the sensitivity of Real Estate negotiations, preliminary acquisition discussions cannot be disclosed. DWR continues to work with DGS on valuation of restoration properties. Currently however, DGS does not recognize restoration as the highest and best use of real property, and as a public agency, DWR can only offer fair-market value for land. This has made it challenging for the department to negotiate with landowners as most property that becomes available is appraised at duck club values, which typically range from \$1,700 to \$3,000 an acre. Offers in that range are almost always rejected, forcing DWR to explore other options for meeting restoration targets.

### **3.1.5 Cache Slough Complex Conservation Assessment**

The Cache Slough Complex is one of the primary areas targeted for tidal wetland restoration. However, currently identified projects will only fulfill about half of the required acreage. To guide the selection and implementation of future restoration projects, FRP staff and consultants are preparing an assessment of the Cache Slough Region. This will be comprised of two volumes: Volume 1 will describe existing conditions of the Cache Slough region, and Volume 2 will present the overarching scientific foundation for the restoration efforts and feasibility analysis methodology. A draft of Volume 1 was completed at the end of 2015 and was provided for public review. Preliminary work has begun on Volume 2. The Volume 1 draft is available to the public on the FRP website.

### **3.2 FRP Coordination Efforts**

The California EcoRestore Program was formed in 2015 to help coordinate and advance habitat restoration in the Sacramento-San Joaquin Delta. FRP staff regularly attend monthly EcoRestore coordination meetings.

To ensure consistency with other habitat restoration efforts in the Bay-Delta, DWR has entered into two memoranda of agreement (MOA). The first, with the State and Federal Contactors Water Agency (SFCWA), sets forth the framework and general terms that SFCWA and DWR mutually agree will guide their coordinated efforts to develop, manage, construct, and implement restoration projects. The FRP and SFCWA staff meet quarterly to provide program and project updates and to coordinate restoration efforts.

SFCWA is carrying out restoration projects to help fulfill the requirements of the Biological Opinions and ITP. Although the FRP is not a lead in planning and implementing these restoration projects, it is expected that projects will be consistent with the goals and processes laid out in the FRP Implementation Strategy, and that DWR will purchase restoration credit upon completion of these projects, per the SFCWA MOA. For this reason, FRP staff regularly attends SFCWA's meetings with the Fisheries Agencies Strategy Team (FAST) and provide input on their projects as they are developed.

The second MOA, regarding the early implementation of habitat restoration projects, establishes a review team and crediting process for habitat restoration projects. FAST is comprised of technical representatives from CDFW, NMFS, USFWS, and USBR. The MOA sets forth a habitat restoration acreage crediting process by FAST that involves technical assistance, project review, and crediting determination towards Biological Opinions / ITP compliance.

FRP staff attends quarterly Delta Conservancy restoration network meetings. The purpose of this effort is to coordinate restoration efforts with public, private, and non-government organizations.

DWR and USBR staffs are leading the effort to fulfill floodplain restoration requirements in the Yolo Bypass (section 2.3). FRP staff have attended meetings and provided comments on the development of the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Implementation Plan, which is intended to outline the implementation of NMFS Biological Opinion RPA Action suites 1.6 and 1.7. Other specific projects that the FRP has provided support for include the proposed North Bay Aqueduct Realignment, Knaggs Ranch Restoration Study and Lower Putah Creek Realignment. Staff are also involved with IEP Yolo Bypass Project Work Team meetings to keep up to date on technical information and informed of future studies and projects occurring in the region.

#### **4. Financials**

With the requirement to restore 8,000 acres, including the costs for land acquisition, land management, planning, design, permitting, monitoring, adaptive management, construction, post-project management, consultants and staff, implementing the FRP is estimated to cost at least \$230 million over 10 years. To date, from July 2009 through December 2015, the FRP expenditures total \$36.2 Million. Revised expenditures for the FRP per fiscal year are shown below in Table 1.

**Table 1.** Fish Restoration Program annual expenditures to date.

STATE FISCAL YEAR FRP EXPENDITURES	ANNUAL ACCOUNT	CAPITAL ACCOUNT(S)	COMBINED TOTAL
FY 2009-2010	\$167,869	0	\$167,869
FY 2010-2011	\$698,075	0	\$698,075
FY 2011-2012	\$1,972,303	\$5,300,000	\$7,272,303
FY 2012-2013	\$3,238,072	\$7,663,892	\$10,901,964
FY 2013-2014	\$5,305,720	\$390,444	\$5,696,164
FY 2014-2015	\$4,153,063	\$1,014,928	\$5,167,991
FY 2015-2016 (Through Dec. 2015)	\$2,120,759	\$4,240,253	\$6,361,012
<b>FRP EXPENDITURES TO DATE (TOTALS)</b>	<b>\$17,655,861</b>	<b>\$18,609,517</b>	<b>\$36,265,378</b>

During the reporting period of July 2009 to December 2015 the following FRP expenditures were made in the categories listed below in Table 2 for a total Program cost to date of \$36.2 Million.

**Table 2.** Fish Restoration Program expenditures to date by projects and categories.

FRP EXPENDITURES BY PROJECTS:	2009-2015 Expenditures
<b>FRP General Costs</b> (CDFW Staff contracts, Consultant contract costs, DWR staff costs & Program Administrative costs)	<b>\$8,401,360</b>
<b>Prospect Island Restoration Project</b>	<b>\$ 12,395,335</b>
<b>Bradmoor Island Restoration Project</b>	<b>\$3,246,388</b>
<b>Decker Island Restoration Project</b>	<b>\$143,703</b>
<b>Winter Island Restoration Project</b>	<b>\$52,851</b>
<b>Property 604 Restoration Project</b>	<b>\$25,741</b>
<b>Battle Creek Salmon &amp; Steelhead Restoration Project Funding</b> (NMFS Action 1.2.6 completed = \$12 Million Dollars )	<b>\$12,000,000</b>
<b>FRP EXPENDITURES TO DATE (TOTALS)</b>	<b>\$36,265,378</b>

## **5. Constraints and Impediments to Restoration**

FRP staff has encountered and are anticipating some constraints and impediments to meeting the timelines established in the Biological Opinions. The more immediate constraints and impediments include:

- Conflicting land use
- Land acquisition challenges
- Potential impacts to neighboring lands
- Mitigation impacts to listed species from restoration construction
- Permitting
- Scientific uncertainty
- Institutional hurdles

