Central Valley Project Improvement Act

Public Law 102-575

Annual Report

Fiscal Year 2014

U.S. Department of the Interior
Bureau of Reclamation
U.S. Fish and Wildlife Service

Finalized August 2016

Cover photographs:

Top: Shasta Lake during the 2014 drought conditions.

Middle: A San Joaquin kit fox at Eastern Ciervo-Panoche Natural Area. Photo courtesy of US Fish & Wildlife Service.

Bottom: Juvenile fall run Chinook salmon rearing on the American River at Sailor Bar, California.

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EXECUTIVE SUMMARY

Introduction

This Annual Report for Fiscal Year (FY) 2014 summarizes the actions authorized under the Central Valley Project Improvement Act (CVPIA or Act) through September 30, 2014 and addresses the requirement under Section 3408 (f) of the Act to submit an annual report to congress. This report summarizes funding levels, activities under the various provisions of the Act, and the status of metrics to measure progress.

On October 30, 1992, President Bush signed Public Law 102-575, the Reclamation Projects Authorization and Adjustment Act of 1992. Title XXXIV amends previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses, and fish and wildlife enhancement as a project purpose equal to power generation. The Act established the Central Valley Project Restoration Fund (Restoration Fund) for donations from any source and revenues provided through payments by CVP water and power customers. The Bureau of Reclamation (Reclamation) and Fish and Wildlife Service (Service) jointly implement the CVPIA for the Department of the Interior (Interior) in collaboration with State and local governments, Tribes, non-governmental organizations, and stakeholders.

The current focus of the CVPIA Program is on fish and wildlife restoration, water management, and conservation activities, authorized in Sections 3406 and 3408 of the Act. Provisions under the CVPIA fall into four broad resource areas including Fisheries (Chapter 2), Water Management (Chapter 3), Refuges (Chapter 4), and Independent Programs (Chapter 5). Figure ES-1 shows the active CVPIA programs that contribute to each resource area as well as those provisions that are complete or inactive. Metrics developed under the CVPIA Program Activity Review (CPAR) Report and other efforts measure progress towards meeting the goals and objectives of the CVPIA (Chapter 6).

For FY 2014, $53.3 million was appropriated to the Restoration Fund to be derived from payments by water and power contractors. As a result of the drought, collections were lower than anticipated by $8.5 million and came later in the year. Reclamation and the Service adapted the 2014 work plans and used unappropriated revenues from prior years to partially mitigate the effects of the drought. Reclamation obligated a net total of $65.8 million including Water and Related Resources ($20.7 million), state trust funds ($2.3 million), and Bay-Delta funds ($4.3 million). Table ES-1 shows the breakdown of funding obligations by program activity. Figure ES-2 shows the obligations by fund source and Figure ES-3 shows the obligations by category.

Administrative work products included the 2012 Financial Report to Congress, Annual Report to Congress for Fiscal Year 2013, and the 2015 Annual Work Plans. These documents are available online at: *http://www.usbr.gov/mp/cvpia*. Work continues on a Structured Decision Making Framework for an Implementation Plan for the Fish Resource Area, a CVPIA Finance Plan to address power contractor concerns with collections for the Restoration Fund, negotiation of a cost-share agreement with the State to replace the expiring Sharing of Costs Agreement for Mitigation Projects and Improvements (SCAMPI), and planning actions to address recommendations from the 2008 and 2009 Independent Review Panels.

Water Management

In changing the management of water, the CVPIA authorized the renewal of long-term water contracts, provided for water transfers, dedicated a portion of CVP yield to fish and wildlife, and mandated changes to CVP operations for fish habitat.

Contract Renewals 3404 (c)

No changes occurred to contract renewals in 2014. Section 3404 (c) authorizes Interior to renew repayment and water service contracts for the delivery of water from the CVP. To date, 100 long term renewal contracts and 28 interim-renewal contracts have been executed within the various divisions of the CVP. Reclamation renewed 132 long term contracts with the Sacramento River Water Right Settlement contractors and one is pending renewal upon expiration in July 2020.

Water Transfers, 3405 (a)

Reclamation approved the transfer of a total of 230,000 acre-feet of CVP water in 2014. Prior to the CVPIA, the ability for CVP water contractors to transfer water

Ongoing Programs			Completed Programs
Fisheries Resources	**Refuge Resources**		**All Resource Areas**
Central Valley	3406 (b)(3) and 3406 (d)(2) Refuge Water Acquisition Program		3406 (b)(5) Contra Costa Canal Pumping Plant
3406 (b)(1) Anadromous Fish Restoration Program	3406 (d)(1), (d)(2), and (d)(5) Wheeling and Conveyance		3406 (b)(6) Shasta Temperature Control Device
3406(b)(2) Dedicated Project Yield	3406 (d)(5) Facilities Construction and San Joaquin Basin Action Plan Lands		3406 (b)(10) Red Bluff Diversion Dam
3406(b)(3) Instream Water Acquisition Program	**Other Resources**		3406 (b)(11) Coleman National Fish Hatchery
3406 (b)(4) Tracy Pumping Plant Program	3404 Contract Renewals		3406 (b)(17) ACID Diversion Dam
3406 (b)(12) Clear Creek Restoration Program	3405 Water Transfers		3406 (b)(20) Glenn-Colusa Irrigation District Program
3406 (b)(13) Spawning and Rearing Habitat Restoration Program	3406 (b)(1) “other” Habitat Restoration Program		3406 (b)(22) Waterfowl Incentive Program
3406 (b)(15) Head of Old River Barrier	3408 (h) Land Retirement Program		3406(c)(1) San Joaquin River Restoration Program
3406 (b)(16) Comprehensive Assessment and Monitoring Program	**CVP Water Operations Resources**		3406 (c)(2) Stanislaus River Basin Water Needs Program
3406 (b)(21) Anadromous Fish Screen Program	3406 (b)(1)(B) Modified CVP Operations		3406 (d)(6) Central Valley Wetlands Supply
3406 (g) Ecosystem and Water System Operations Models	3406 (b)(7) Flow Standards and Objectives		3406 (e) Supporting Investigations
Trinity River Basin	3406 (b)(8) Short Pulse Flows		3406 (f) Project Fisheries Impact Report
3406 (b)(23) Trinity River Restoration Program	3406 (b)(9) Flow Fluctuations		3408 (i) Water Conservation Program
San Joaquin River Basin	3406 (b)(19) Reservoir Storage		3408 (j) Water Augmentation (Yield Study)
P.L. 111-11 San Joaquin River Restoration Program			

* In FY 2012, the Red Bluff Diversion Dam Program substantially completed construction of the new, 2,500-cfs permanent pumping plant and fish screen. Fine tuning of the pumping plant equipment and monitoring of the riparian mitigation site continues to occur using sources other than Restoration Funds.

Figure ES-1: Ongoing Programs by Resource Area and Completed Programs

supplies was limited depending upon the individual contracts. Section 3405 (a) authorizes Interior to approve the transfer of CVP water to other users within the state for any purpose recognized as beneficial under state law, subject to certain terms and conditions. Section 3405 (a)(1)(M) created the Accelerated Water Transfer Program (AWTP) for transfers between Central Valley Project contractors within counties, watersheds, or other areas of origin. Transfers authorized by the CVPIA in 2014 included:

- Sacramento Basin AWTP: 22,292 acre-feet
- Delta-Mendota Canal AWTP: 6,871 acre-feet
- Friant Division AWTP: 11,721 acre-feet
- North of Delta to South of Delta: 83,037 acre-feet
- South of Delta Non-AWTP: 106,545 acre-feet

Dedicated Yield 3406 (b)(2) and Operations for Fish Habitat, 3406 (9) and (19)

Consistent with Section 3406(b)(2) of the CVPIA and Interior’s May 2003 (b)(2) Policy, the total (b)(2) water allocation was 600 thousand acre feet (TAF) during the 2014 water year. However, due to these

historically dry hydrological conditions, Interior was only able to make approximately 400,000 AF of the 600,000 AF of CVPIA (b)(2) water available. Under the Flow Fluctuations Program, the Sacramento River Stranding Project, a collaborative project with Golden Gate Salmon Association, began in FY 2013 to reduce fall chinook salmon redd dewatering post-irrigation season and was suspended again in FY 2014 due to unfavorable hydrologic conditions. The Reservoir Storage Program did not meet the carryover targets for Shasta and Trinity reservoirs due to drought.

Under the Dedicated Yield Program (b)(2), Reclamation and the Service dedicate and manage up to 800,000 acre-feet of CVP yield with shortage provisions for critically dry years. The Flow Fluctuations and Reservoir Storage Program seeks to maintain carryover water storage and deliver appropriately timed flows and flows of adequate quality to support fisheries restoration and meet other project purposes.

Fish Resource Area

The Act directs Interior to, "implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991…." The target established by this section of the Act is known as the "fish-doubling goal", which pertains to Chinook salmon, rainbow trout (steelhead), striped bass, American shad, white sturgeon and green sturgeon; species believed to have been impacted by CVP construction and operation. The Final Restoration Plan for the Anadromous Fish Restoration Program (Service, 2001) identified 289 actions and evaluations that were determined to be reasonable given numerous technical, legal and implementation considerations. When the Plan's actions are implemented in concert, they provide for comprehensive restoration that improves freshwater habitat for Chinook salmon and other anadromous fish species. The Fish Resource Area is divided up into programs reflecting the individual provisions of the Act. Completed fish resource area provisions include:

- Contra Costa Canal Pumping Plant, 3406 (b)(5)
- Shasta Temperature Control Device, 3406 (b)(6)
- Red Bluff Diversion Dam, 3406 (b)(10)
- Coleman National Fish Hatchery, 3406 (b)(11)
- Anderson-Cottonwood Irrigation District Diversion Dam, 3406 (b)(17)
- Glenn-Colusa Irrigation District Fish Screen, 3406 (b)(20)
- Waterfowl Incentive Program, 3406 (b)(22)

Anadromous Fish Restoration Program (AFRP), 3406 (b)(1)

AFRP continued 38 various projects to address high priority limiting factors in 20 watersheds, including fish passage, entrainment, habitat restoration, and spawning gravel augmentation projects as well as variety of assessments and evaluations that are providing information critical for future projects. No structural or non-structural actions were completed in FY 2014,

The AFRP seeks to address the limiting factors in each watershed. On watersheds where the CVPIA substantially addressed most limiting factors, fish populations have exceeded the doubling goals. These watersheds include Clear Creek, Butte Creek, and Battle Creek. The AFRP continued progress toward actions and evaluations in the Sacramento and San Joaquin watersheds to enhance passage and habitat, and reduce loss of fish. About 23% of the 289 Restoration Plan actions and evaluations have been completed to date. Of the 128 "time certain" high and medium priority actions, forty-six (46%) have been completed.

Water Acquisition Program – Instream Water (Instream WAP), 3406 (b)(3)

Due to the severe drought no water was acquired in FY14 for instream flows.

Tracy (Jones) Pumping Plant, 3406 (b)(4)

Actions taken to improve the Tracy Fish Facility in FY 2014 include continued work to improve the louver systems, the development of land for onsite research and fish protection, replacement of the secondary louvers, the continued work towards a third fish release site and various research studies that will improve fish capture and reintroduction capabilities.

Clear Creek Restoration Program (CCRP), 3406 (b)(12)

The CCRP provided instream pulse flows and maintained temperature of flows to attract fish and promote upstream movement. The program added about 8,000 tons of gravel to four sites in 2014. The program also evaluated past spawning gravel placement and monitored the impacts of the 2008, 2012 and 2013 wildfires in the South Fork Clear Creek tributary. The program continued monitoring fish populations with 2013 escapement numbers for fall-run estimated at 13,337.

Spawning and Rearing Habitat Restoration Program, 3406 (b)(13)

The Gravel program worked on permitting for new habitat restoration project sites in the Sacramento River and created a 400 yard long side channel and placed 10,000 tons of gravel just below Nimbus Dam on the American River. The program conducted spawning surveys and surveys of downstream movement of previously placed gravel on the Stanislaus River.

Comprehensive Assessment and Monitoring Program (CAMP), 3406 (b)(16)

CAMP produced its 2014 annual report assessing the overall effectiveness of actions implemented pursuant to CVPIA section 3406(b) in meeting AFRP fish production targets. CAMP continues to support fish population evaluations through the development of the Rotary Screw Trap Platform, monitoring at several locales within the CVP area, marking and tagging of juvenile fall-run Chinook salmon at the Nimbus Fish Hatchery and Coleman National Fish Hatchery and studies on the Cottonwood and Battle Creeks. The program also supported the Science Based Management Framework in conjunction with the other fisheries programs to develop tools and a process that will enable a comprehensive and prioritized fisheries management approach CVPIA-wide.

Anadromous Fish Screen Program (AFSP), 3406 (b)(21)

Construction was completed on the Yuba City (74 cfs) and Feather Water District North (78 cfs) and South (40 cfs) diversion fish screens on the Feather River. Fish screen construction was initiated for the Natomas Mutual Water Company Pritchard Lake diversion (150 cfs), and Reclamation District 2035/Woodland Davis Clean Water Agency Joint Intake (400 cfs) on the Sacramento River. In addition, the AFSP continued to support design, environmental compliance and permitting activities for the following fish screen projects: Colusa Indian Community Council Compton diversion (22 cfs) on the Sacramento River, South Sutter Water District Pleasant Grove Canal diversion (80 cfs) on Auburn Ravine, and the West Stanislaus Irrigation District Joint Use Intake (375 cfs) on the lower San Joaquin River.

Refuge Water Supply

Section 3406 (d) of the Act contributes to the maintenance, restoration and enhancements of wetlands and waterfowl habitat. The Act directs Interior to: provide, either directly or through contractual agreements with other appropriate parties, firm water supplies of suitable quality to maintain and improve wetland habitat areas on 19 federal, state and private lands, collectively referred to as "refuges." The Refuge Water Supply Program (RWSP) goal is to provide 555,515 AF of water annually, comprised of 422,251 AF of Level 2 water, which also includes 26,007 AF of replacement water, and 133,264 AF of Incremental Level 4 water. Full Level 4 water is the sum of Level 2 and Incremental Level 4 water. The RWSP allocates water on a contract year starting in March and continuing through February of the next year. This report shows refuge water deliveries from March 2013 through February 2014.

Water Acquisitions – Refuge Water (Refuge WAP), 3406 (d)(2)

In 2013, the RWAP purchased up to 33,925 AF of water for Water Year 2013 through contracts with Grasslands Water District, San Joaquin River Exchange Contractors Water Authority and Merced Irrigation District.

Refuge Water Conveyance Component (RWCC), 3406 (d)(1),(2) and (5)

The RWCC delivered an estimated 389,343 AF of Level 2 water and an estimated total of 48,096 AF of Incremental Level 4 water to the refuges during Contract Year 2013. Of the Level 2 water, a total of 51,879 AF was delivered from diverse, non-CVP sources.

Reclamation delivered 100 percent of Level 2 water supplies scheduled by CVPIA refuges in Contract Year 2013. The goal of delivering 422 TAF was not met for several reasons. Contributing factors to refuges not scheduling 100% of their L-2 allocation include:

- Conveyance capacity restrictions to certain refuges;
- Refuge internal distribution systems groundwater pump mechanical failures;
- Unexpected erosion around newly constructed alfalfa valves;
- Regionally, a few refuges received more precipitation than other refuges, reducing their demand for full Level 2 during certain months in Contract Year 2013; and
- Water schedules that are developed and implemented on a water-year basis versus a fiscal-year. Much of the RWSP is implemented and operated on a water-year basis, including the Refuge Water Supply Contracts and refuge water conveyance agreements.

Refuge Facilities Construction Component (RFCC), 3406 (d)(5)

To date, 15 of the 19 CVPIA refuges have the external conveyance capacity to receive Full Level 4 water.

In FY 2014, the RFCC focused construction efforts at the East Bear Pumping Plant located at the East Bear Creek Unit of the San Luis National Wildlife Refuge Complex, at Biggs-West Gridley Water District Facilities Improvement Project for the Gray Lodge Wildlife Area, and at the Gray Lodge and Pixley groundwater wells. Initial studies began to assess a water supply conveyance system for the Sutter National Wildlife Refuge.

Independent Programs

Habitat Restoration Program (HRP), 3406 (b)(1) "Other"

The HRP focuses on protecting and restoring native species and their habitats that have been directly and indirectly affected by the CVP's construction and operation. This is accomplished through the purchase of fee title or conservation easements on lands where threats are significant, and through restoring lands to native habitat. The HRP also funds research, and captive propagation and reintroduction projects. The HRP contributes to the protection and/or restoration of lands and habitats affected by the construction and operation of the CVP. The 1999 State Water Resources Control Board Decision 1641 (SWRCB's D-1641) requires that Reclamation provide compensation and habitat values to mitigate for impacts associated with the delivery of CVP water to lands previously outside the CVP Consolidated Place of Use. It identifies the HRP as one of three Reclamation programs suitable for fulfilling the mitigation plan. Pursuant to the SWRCB's D-1641, Reclamation developed the Consolidated Place of Use, Habitat Mitigation Plan and Monitoring and Reporting Program (HMP) as a report/strategy for how the mitigation requirements will be addressed. The HMP identifies acquisition, maintenance, and restoration of 45,391 acres needing to occur as mitigation related to the CVP Consolidated Place of Use. To date, the program has protected 1,749 acres of land towards the D-1641 goal.

In fiscal year 2014, the HRP helped protect about 795 acres on two parcels located on the eastern slope of the Ciervo Hills to benefit several federally listed species in western Fresno County.

Land Retirement Program (LRP), 3408 (h)

The LRP goals include the purchase and retirement of land from agricultural production to improve water quality and provide for terrestrial habitat restoration. By ceasing irrigation of agricultural lands, the LRP reduces the volume of agricultural drainage produced, improving water quality and providing the opportunity to restore wildlife habitat. Specifically, the goal of the LRP is to retire 15,000 acres of agricultural lands by 2014 for the Land Retirement Demonstration Project and to restore up to 400 acres of that land annually.

Ecosystem and Water Systems Operation Models (Modeling), 3406 (g)

The Modeling Program continued to develop models and supporting data to evaluate water management strategies for the CVPIA Programs. In FY 2014, the program continued ongoing development and modification of the following programs: CalSim II, the CalLite, CalSim 3.0, HEC-5Q based temperature model, C2VSIM (California Central Valley Groundwater-Surface Water Simulation Model), ANN, DSM2, inSALMO, and HydroGeoSphere (HGS). The program also prepared publications and provided support to model applications.

San Joaquin River Restoration Program (SJRRP), Public Law 111-11

Section 10009 (b)(2) of Public Law 111-11 authorizes up to $2 million (indexed to 2006 funds) from the CVP Restoration Fund for implementation of the San Joaquin River Restoration Program (SJRRP). Activities, including planning and environmental studies aim to restore and maintain fish populations in "good condition" on the mainstem of the San Joaquin River while reducing or avoiding adverse water supply impacts to Friant Division long-term contractors. Specific actions to achieve these goals include reintroduction of spring-run Chinook salmon, restoration flow releases and recirculation of restoration flows back to Friant Division contractors. The Central Valley Project Restoration Fund supplements the program's funding under PL 111-11.

The Restoration Fund contributes to the environmental analysis for the Reach 4B and Mendota Pool Bypass projects, as well as the Conservation Facility development. SJRRP accomplishments are reported at *http://www.restoresjr.net*.

Trinity River Restoration Program (TRRP), 3406 (b)(1) "Other" and (b)(23)

The CVPIA includes provisions to authorize activities for the Trinity River Restoration Program (TRRP); Section 3406 (b)(23) for delivering flows and 3406 (b)(1) for river restoration. The goal of the TRRP is to restore and sustain natural production of anadromous fish populations downstream of Lewiston Dam to pre-dam levels, and to facilitate dependent Tribal, commercial, and sport fisheries' full participation in the benefits of restoration via enhanced harvest opportunities. This will be accomplished through restoring habitats for the anadromous fishery resources by implementing variable annual instream flows, rehabilitating the channel, and managing sediment, as

stipulated in the December 2000, Record of Decision (ROD), for the Trinity River Mainstem Fishery Restoration Final Environmental Impact Statement/ Environmental Impact Report (EIS/EIR).

A channel rehabilitation project was completed at Lower Junction City. Five watershed projects including watershed condition assessments and educational outreach activities were completed in FY 2013 that continue to keep approximately 15,500 CY of fine sediment out of the mainstem. The Program conducted monitoring and assessment of biological and physical conditions to determine project effectiveness and salmon production.

Table ES-1. FY 2014 Breakdown of Funding Obligations by Program Activity

Section	Activity		Water & Related Funds	Restoration Funds	State Funds	Bay Delta Funds	ARRA Funds	Total Funds
3405(a)	Water Transfer Program		0	0	0	418,366	0	418,366
3406(b)(1)	Anadromous Fish Restoration Program		0	7,765,338	0	0	0	7,765,338
3406(b)(1)	Habitat Restoration Program		0	1,522,605	0	0	0	1,522,605
3406(b)(1)	Bay-Delta Activity		682,654	0	0	3,474,149	0	4,156,803
3406(b)(2)	Dedicated Project Yield		0	493,439	0	0	0	493,439
3406(b)(3)	Water Acquisition Program - Instream Water		(2,570,000)	215,265	0	0	0	(2,354,735)
3406(b)(4)	Tracy (Jones) Pumping Plant Program	Tracy (Jones) Pumping Plant[1]	1,124,884	0	0	0	0	1,124,884
		Two Gates	0	0	0	0	0	0
3406(b)(5)	Contra Costa Pumping Plant No. 1		2,143,914	0	48	0	0	2,143,962
3406(b)(9)	Flow Fluctuations		0	47,279	0	0	0	47,279
3406(b)(10)	Red Bluff Diversion Dam		636,515	0	0	0	14,654	651,169
3406(b)(12)	Clear Creek Restoration Program		0	655,320	0	0	0	655,320
3406(b)(13)	Spawning Gravel		0	500,348	662,829	0	0	1,163,177
3406(b)(16)	Comprehensive Assessment and Monitoring Program		2,531,125	3,137,377	0	0	0	5,668,502
3406(b)(20)	Glenn Colusa Irrigation District		0	0	0	0	0	0
3406(b)(21)	Anadromous Fish Screen Program		3,175,000	2,345,740	1,635,582	768,000	0	7,924,322
3406(b)(23)	Trinity River Restoration		2,338,551	0	0	0	0	2,338,551
3406(b)(1)	Trinity River Restoration Program		10,267,715	1,517,937	0	0	0	11,785,652
PL 111-11	San Joaquin River Restoration Program		0	1,936,297	0	0	0	1,936,297
3406(d)(1)	Refuge Water Supply							
3406(d)(2)	Refuge Water Supply Level 4		0	1,083,628	0	(350,000)	0	733,628
3406(d)(5)	Refuge Facilities Construction Program	Construction	0	4,469,209	0	0	0	4,469,209
		Wheeling	0	9,972,876	0	0	0	9,972,876
3406(d)(5)	San Joaquin Basin Action Plan		340	36,006	0	0	0	36,346
3406(g)	Ecosystem & Water System Operations Models		290,250	677,983	0	0	0	968,233
3408(h)	Land Retirement Program		69,811	515,488	0	0	0	585,299
3407	CVPIA Administration		0	1,558,619	0	0	0	1,558,619
TOTAL FUNDING OBLIGATED			**20,690,759**	**38,450,753**	**2,298,459**	**4,310,515**	**14,654**	**65,765,141**

1 Prior year recoveries are included and may result in a negative or reporting of less than total FY 2014 obligation. See Cumulative chart

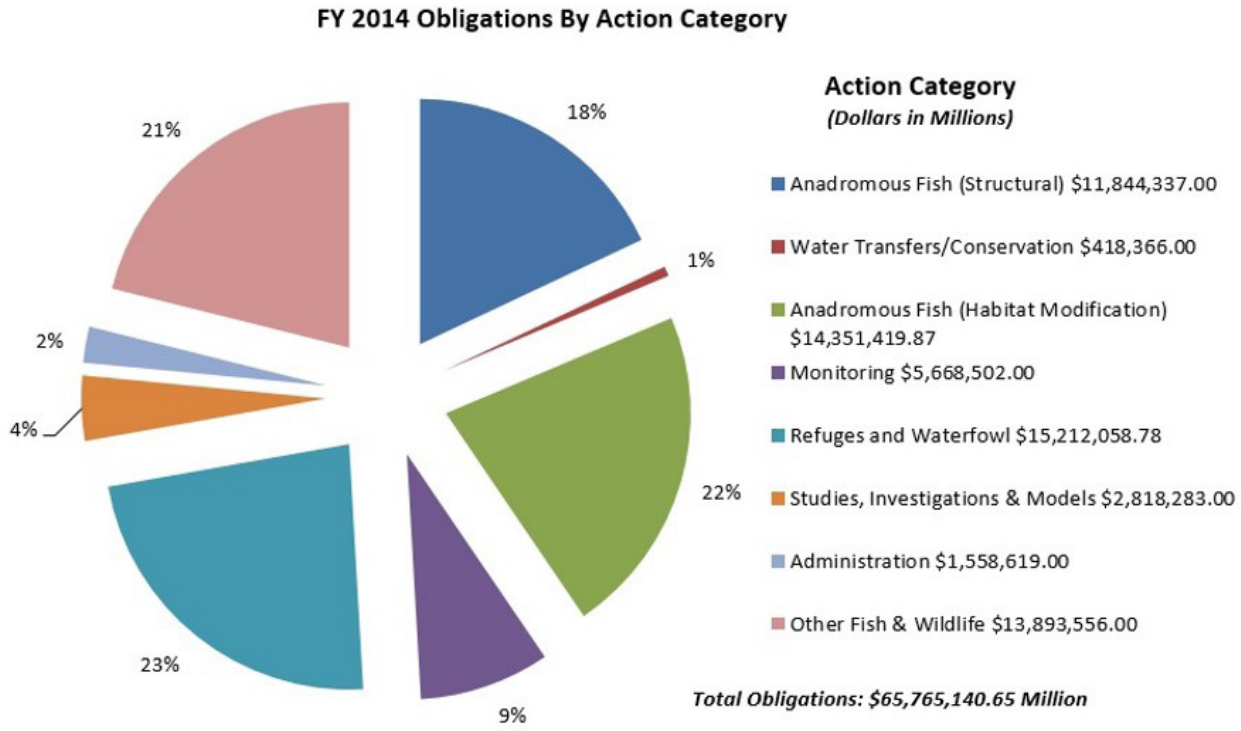

Figure ES-2. FY 2014 Breakdown of Funding Obligations by Program Activity

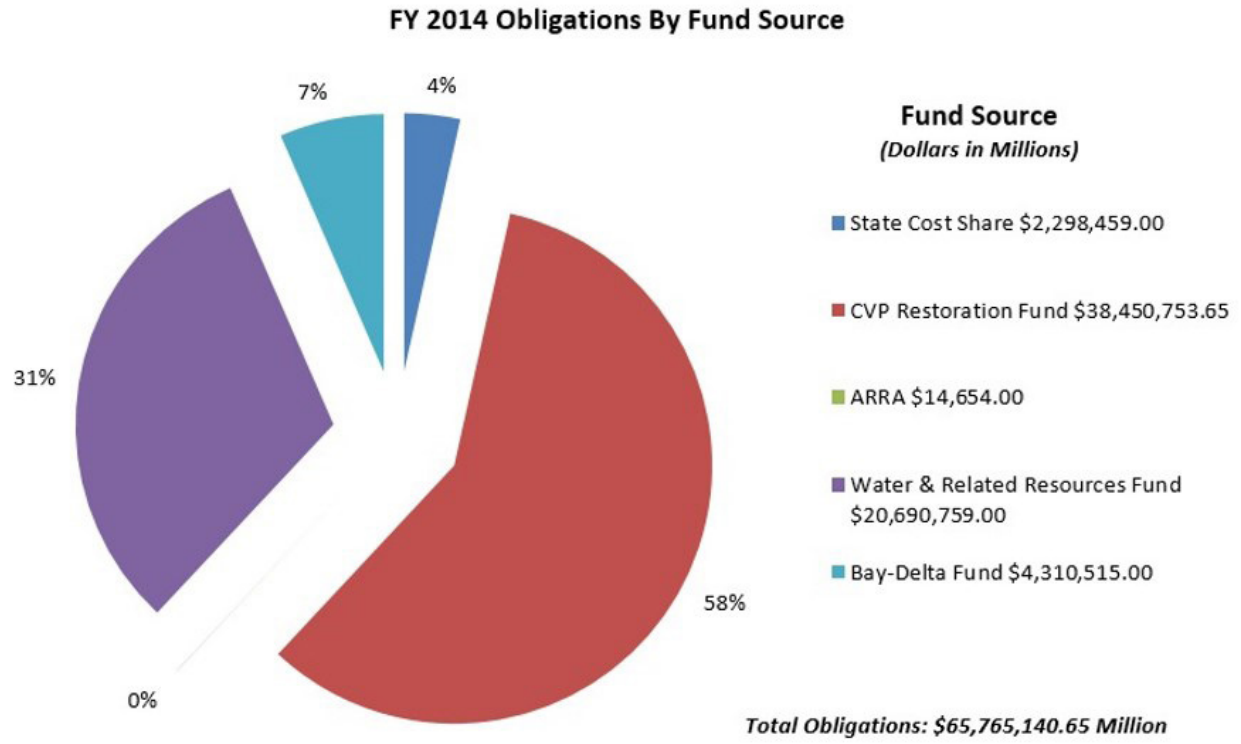

Figure ES-3. FY 2014 Breakdown of Funding Obligations by Fund Source

CHAPTER 1 - INTRODUCTION

Purpose

This Annual Report for Fiscal Year (FY) 2014 summarizes the actions authorized under the Central Valley Project Improvement Act (CVPIA or Act) through September 30, 2014 and addresses the requirement under Section 3408 (f) of the Act to submit an annual report to congress. This report summarizes funding levels, activities under the various provisions of the Act, and the status of metrics to measure progress.

Background

Authorized in 1935, construction of the Central Valley Project (CVP), California, resulted in 20 dams and reservoirs, 11 power plants, and 500 miles of canals and aqueducts. CVP facilities manage 9 million acre-feet of water storage and generate an average of 5.5 billion kilowatt-hours of electricity. The majority of the water supply for the Central Valley originates in the north within the Sacramento River Basin and is conveyed across the Sacramento-San Joaquin Delta to the San Joaquin Valley and further south (see Figure 1). Initial features of the project were built primarily to protect the Central Valley from crippling water shortages and menacing floods. Today, the CVP maintains Sacramento River navigation, supplies domestic and industrial water, generates electric power, conserves fish and wildlife, creates opportunities for recreation, and enhances water quality. This multiple-purpose project plays a key role in California`s economy, providing water for 6 of the top 10 agricultural counties in the nation`s leading farm state, approximately one-third of the agricultural land in California.

The benefits of the CVP did not come without costs. The construction of dams and the diversion of water affected the ecosystems of the Central Valley, Bay Delta Estuary, and Trinity River Basin. Populations of anadromous fish declined to levels resulting in the listing of some species under the Endangered Species Act. Conversion of historical wetlands to agricultural purposes reduced the habitat for migratory birds and other species, in some cases resulting in additional listings.

In 1992, the 102nd Congress passed, and President Bush signed, the multi-purpose water legislation known as the CVPIA. Officially Title XXXIV of Public Law 102-575, this legislation amends previous authorizations of the California Central Valley Project (CVP) to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses; and fish and wildlife enhancement as a project purpose equal to power generation. The purpose of the CVPIA is expressed in six broad statements found in Section 3402 of the Act:

- To protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California;
- To address impacts of the CVP on fish, wildlife, and associated habitats;
- To improve the operational flexibility of the Central Valley Project;
- To increase water-related benefits provided by the CVP to the State of California (State) through expanded use of voluntary water transfers and improved water conservation;
- To contribute to the State's interim and long-term efforts to protect the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary;
- To achieve a reasonable balance among competing demands for use of CVP water, including the requirements of fish and wildlife, agricultural, municipal and industrial, and power contractors.

The Secretary of the Department of Interior (Interior) assigned responsibility for implementing CVPIA's provisions jointly to Reclamation and the Service. Reclamation and the Service coordinate with other federal agencies, tribes, the State, partner organizations, and other stakeholders during each fiscal year to plan and implement activities. The CVPIA operates in a complex environment and coordinates with actions to: operate the State and Federal water projects, comply with the State's Water Quality Control Plan, implement Biological Opinions, support Endangered

Figure 1: Central Valley Project (CVP) System

Species Recovery Programs, continue water resources development, and further local projects, among other initiatives. Reclamation and the Service partner with entities that have the authority, interest, ability, expertise, and resources to implement CVPIA restoration actions using a variety of instruments such as interagency agreements, memoranda of understanding, grants, cooperative agreements, and contracts.

Report Organization

This Chapter 1 summarizes funding for the activities under the CVPIA and reports on administrative expenses. The specific activities under the CVPIA fit within four broad resource areas:

- Chapter 2 describes actions to improve fisheries, primarily the facility and habitat provisions under 3406(b) including the Anadromous Fish Restoration Program 3406(b)(1);
- Chapter 3 describes water operations including the contract renewal and transfer provisions of the CVPIA, sections 3404 and 3405 of the CVPIA. In addition, Chapter 2 reports on the use of water dedicated for fish and wildlife purposes and operations of the CVP, paragraphs 3406(b)(2) and (9), and the Water Acquisition Program 3406(b)(3) for instream flows;
- Chapter 4 describes actions to provide water supplies for wetland habitat areas, Section 3406(d);
- Chapter 5 describes the independent programs under the CVPIA including the Habitat Restoration Program 3406(b)(1), Federal Science Task Force 3406(b)(1), Land Retirement Program 3408(h), Ecosystem and Water Operations Modeling Program 3406(g), San Joaquin River Restoration Program (Title X of Public Law 111-11), and Trinity River Restoration Program 3406(b)(1) and (23),
- Chapter 6 summarizes the metrics measuring progress towards meeting the goals and objectives of the CVPIA.

Additional information on the completed projects and how they have contributed to the CVPIA restoration efforts may be found online at *http://www.usbr.gov/mp/cvpia*.

Funding

Funding to implement the CVPIA derives from multiple sources: CVP Restoration Fund (RF or Restoration Fund), Water and Related Resources (W&RR), Bay-Delta Fund, American Recovery and Reinvestment Act Fund (ARRA), and the State of California (State). Figure 2 shows the historical breakdown of funding from the different sources. Figure 3 shows the historical obligation by category of expenditure.

The Restoration Fund, established by Section 3407 of the CVPIA, is an account in the Treasury of the United States (U.S.) to be available for deposits of donations and revenues provided under the CVPIA. The Restoration Fund is authorized for up to $50 million (1992 price levels) to be derived from the revenue sources provided by the Act. The majority of revenues for the Restoration Fund derive from Mitigation and Restoration payments by CVP water and power contractors. Paragraph 3407(d) limits Mitigation and Restoration Payments to no more than $30 million (1992 price level) on a three-year rolling average basis. The rolling average results in a cyclical funding pattern with high, medium, and low collection years. Use of the Restoration Fund requires collections in advance of expenditures.

For FY 2014, $53.3 million was appropriated to the Restoration Fund to be derived from collections from CVP water and power beneficiaries. As a result of the drought, collections were lower than anticipated by $8.5 million and came later in the year. Revenues did not reach the levels anticipated by appropriations and many actions were initiated behind schedule. Unappropriated revenues from prior years provided some small ability to mitigate the effects of the drought. Figure 5 shows a total of $65.8 million in obligations with the addition of Water and Related Resources ($20.7 million), state cost share funds ($2.3 million), and Bay-Delta funds ($4.3 million). Table 1 shows a breakdown of funding for each CVPIA Program activity in FY 2014. Additional financial reporting is posted online at *http://www.usbr.gov/mp/cvpia*.

CVPIA Administration

CVPIA Administration addresses activities necessary for implementation, but that cannot be reasonably attributed to the other more specific sections of the Act. Administration provides for developing and implementing the overall budget, collecting revenues

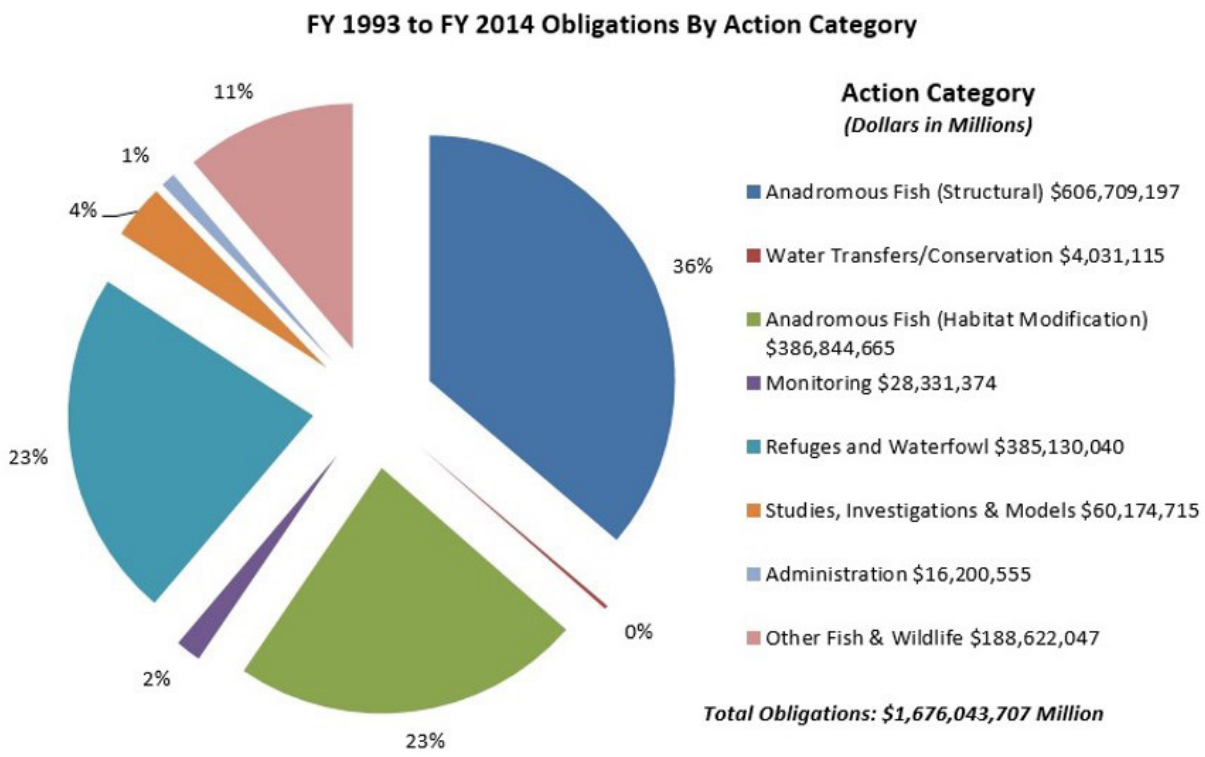

Figure 2: Program Financial Obligations By Action Category to Date (in $ millions)

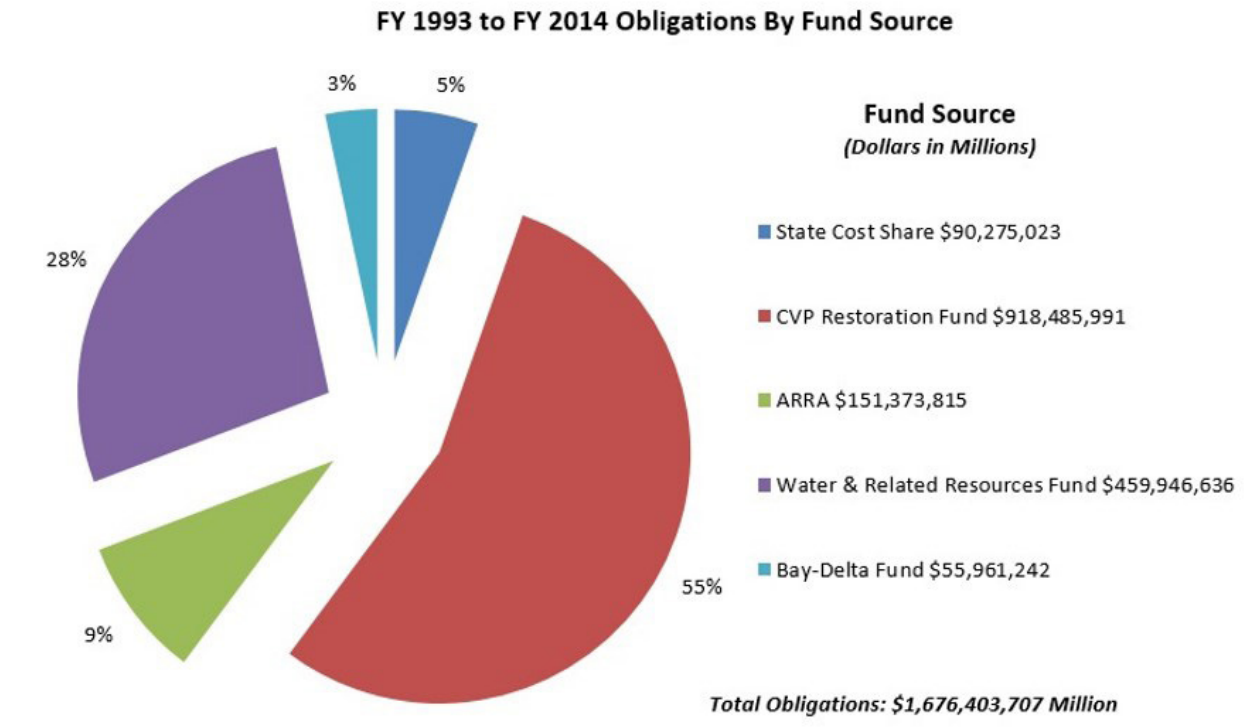

Figure 3: Program Financial Obligations By Fund Source to Date (in $ millions)

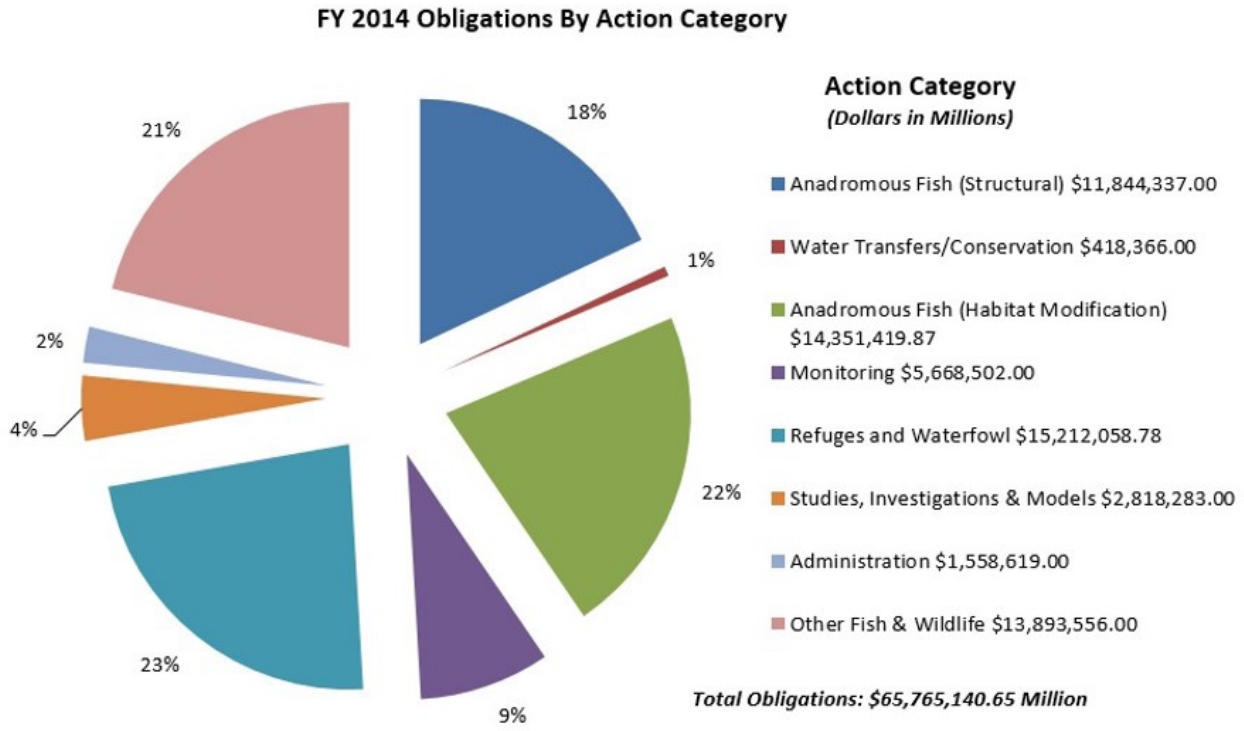

Figure 4. FY 2014 Breakdown of Funding Obligations by Program Activity

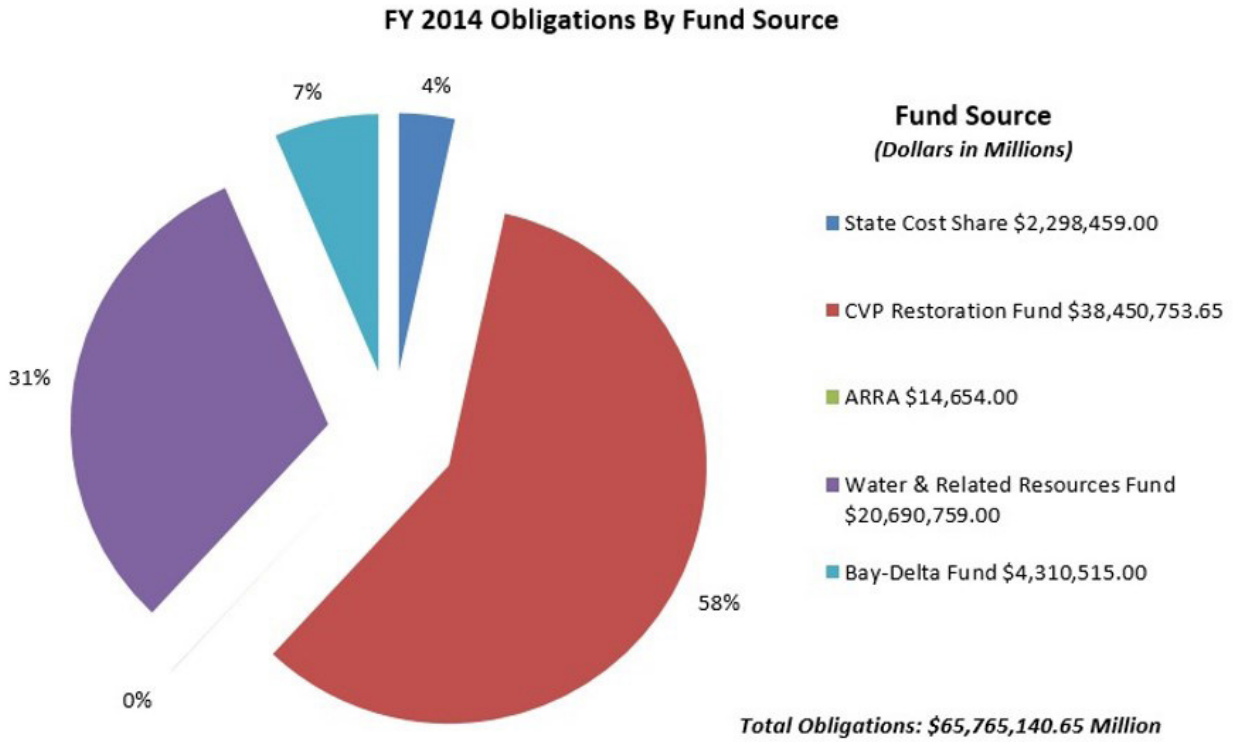

Figure 5. FY 2014 Breakdown of Funding Obligations by Fund Source

Table 1. FY 2014 Breakdown of Funding Obligations by Program Activity

Section	Activity		Water & Related Funds	Restoration Funds	State Funds	Bay Delta Funds	ARRA Funds	Total Funds
3405(a)	Water Transfer Program		0	0	0	418,366	0	418,366
3406(b)(1)	Anadromous Fish Restoration Program		0	7,765,338	0	0	0	7,765,338
3406(b)(1)	Habitat Restoration Program		0	1,522,605	0	0	0	1,522,605
3406(b)(1)	Bay-Delta Activity		682,654	0	0	3,474,149	0	4,156,803
3406(b)(2)	Dedicated Project Yield		0	493,439	0	0	0	493,439
3406(b)(3)	Water Acquisition Program - Instream Water		(2,570,000)	215,265	0	0	0	(2,354,735)
3406(b)(4)	Tracy (Jones) Pumping Plant Program	Tracy (Jones) Pumping Plant[1]	1,124,884	0	0	0	0	1,124,884
		Two Gates	0	0	0	0	0	0
3406(b)(5)	Contra Costa Pumping Plant No. 1		2,143,914	0	48	0	0	2,143,962
3406(b)(9)	Flow Fluctuations		0	47,279	0	0	0	47,279
3406(b)(10)	Red Bluff Diversion Dam		636,515	0	0	0	14,654	651,169
3406(b)(12)	Clear Creek Restoration Program		0	655,320	0	0	0	655,320
3406(b)(13)	Spawning Gravel		0	500,348	662,829	0	0	1,163,177
3406(b)(16)	Comprehensive Assessment and Monitoring Program		2,531,125	3,137,377	0	0	0	5,668,502
3406(b)(20)	Glenn Colusa Irrigation District		0	0	0	0	0	0
3406(b)(21)	Anadromous Fish Screen Program		3,175,000	2,345,740	1,635,582	768,000	0	7,924,322
3406(b)(23)	Trinity River Restoration		2,338,551	0	0	0	0	2,338,551
3406(b)(1)	Trinity River Restoration Program		10,267,715	1,517,937	0	0	0	11,785,652
PL 111-11	San Joaquin River Restoration Program		0	1,936,297	0	0	0	1,936,297
3406(d)(1)	Refuge Water Supply							
3406(d)(2)	Refuge Water Supply Level 4		0	1,083,628	0	(350,000)	0	733,628
3406(d)(5)	Refuge Facilities Construction Program	Construction	0	4,469,209	0	0	0	4,469,209
		Wheeling	0	9,972,876	0	0	0	9,972,876
3406(d)(5)	San Joaquin Basin Action Plan		340	36,006	0	0	0	36,346
3406(g)	Ecosystem & Water System Operations Models		290,250	677,983	0	0	0	968,233
3408(h)	Land Retirement Program		69,811	515,488	0	0	0	585,299
3407	CVPIA Administration		0	1,558,619	0	0	0	1,558,619
TOTAL FUNDING OBLIGATED			**20,690,759**	**38,450,753**	**2,298,459**	**4,310,515**	**14,654**	**65,765,141**

1 Prior year recoveries are included and may result in a negative or reporting of less than total FY 2014 obligation. See Cumulative chart.
Note: Numbers have been rounded.

for the Restoration Fund, reporting, coordination between the individual CVPIA activities, and oversight of activities. Charges include accounting and budget staff, CVPIA Administrators, administration support staff, and Regional Office management for both the Service and Reclamation.

Specific products included the 2012 Financial Report to Congress, Annual Report to Congress for Fiscal Year 2013, and the 2015 Annual Work Plans. These documents are available online at: *http://www.usbr.gov/mp/cvpia*. In addition to managing execution of the budget, work continued on a Structured Decision Making Framework for an Implementation Plan for the Fish Resource Area, a CVPIA Finance Plan to address power contractor concerns with collections for the Restoration Fund, negotiation of a cost-share agreement with the State to replace the expiring Sharing of Costs Agreement for Mitigation Projects and Improvements (SCAMPI), and continued actions to address recommendations from the 2008 and 2009 Independent Review Panels.

CHAPTER 2 - FISHERIES RESOURCE AREA

Anadromous Fish Restoration Program, 3406 (b)(1)

The Anadromous Fish Restoration Program (AFRP) is the overarching program to address anadromous fish doubling in the Central Valley. The Act specifically directs Interior to:

"… implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991…"

Subsequent to CVPIA's passage, the AFRP developed a series of planning reports that culminated in the Final AFRP Restoration Plan (Final Restoration Plan) (FRP) in 2001. The Final Restoration Plan guides the implementation of the actions and evaluations which were developed to address the doubling goal. The 289 actions and evaluations in the Final Restoration Plan are categorized by six programmatic-level objectives:

- Improve habitat for all life stages of anadromous fish through provision of flows of suitable quality, quantity, and timing, and improved physical habitat
- Improve survival rates by reducing or eliminating entrainment of juveniles at diversions
- Improve the opportunity for adult fish to reach their spawning habitats in a timely manner
- Collect fish population, health, and habitat data to facilitate evaluation of restoration actions
- Integrate habitat restoration efforts with harvest and hatchery management
- Involve partners in implementing and evaluating restoration actions

Performance Measures

Central Valley rivers and streams were defined in the January 9, 2001, Final Restoration Plan (FRP) for the AFRP as all rivers, streams, creeks, sloughs and other watercourses, regardless of volume and frequency of flow, that drain into the Sacramento River basin, the San Joaquin River basin downstream of Mendota Pool, or the Sacramento-San Joaquin Delta upstream of Chipps Island. The 22 rivers and streams are specifically called out within Appendix B of the FRP and are listed in Appendix B of this report.

The anadromous fish natural production targets pertain to Chinook salmon, steelhead, striped bass, American shad, white sturgeon, and green sturgeon, which are believed to have been affected by CVP construction and operation.

Table 5 below lists the doubling target by species. The AFRP implements actions and evaluations that will contribute to the doubling of the natural production of anadromous fish populations. To achieve the fish-doubling goal, the AFRP has identified 289 actions and evaluations that support Fisheries restoration (Table 3). The CVPIA Program Activity Review (CPAR) Report identified 128 Restoration Plan high and medium priority actions that are "time certain", structural (53), such as fish screens or passage obstacles and non-structural actions (75), such as flow fluctuations or studies (Table 4).

FY 2014 Accomplishments

The AFRP obligated $7.8 million from the Restoration Fund in FY 2014.

The AFRP continued progress toward programmatic actions and evaluations throughout Central Valley rivers and streams to enhance passage and habitat, and reduce loss of fish. Table 2 presents the average natural production estimate by species since 1992, including the most recent data available (2013 or earlier, depending on species).

The Central Valley Chinook salmon (all races) natural production average from 1992-2013 was 396,881 fish which dropped below the 1967-1991 baseline average Chinook salmon production of 497,054. Average Chinook salmon natural production for the period 1992-2013 has exceeded the watershed doubling goal target on Clear Creek, Butte Creek, and Battle Creek, and in 2012 and 2013 the Mokelumne River observed high returns (12,660 and 11,482 naturally produced fish respectively; Table 5). Substantial gains in fish populations have been observed where investment in flow and passage has occurred. Clear Creek and the Mokelumne River have also had a substantial investment in habitat restoration. Winter-run Chinook

Table 2. Yearly Estimates of Natural Production of Anadromous Fish and the Average Natural Production by Species within Central Valley River and Streams, 1992-2013

Year	Steelhead[a]	American Shad[b]	Striped Bass[c]	Green Sturgeon[d]	White Sturgeon[e]	*Chinook Salmon Run* ---------- Fall	*Chinook Salmon Run* ---------- Late Fall	*Chinook Salmon Run* ---------- Winter	*Chinook Salmon Run* ---------- Spring
Baseline	6,546	2,129	1,252,259	983	5,571	374,049	34,192	54,439	34,374
Target	13,000	4,300	2,500,000	2,000	11,000	750,000	68,000	110,000	68,000
1992	4,086	2,012	777,293	N/A	N/A	192,117	27,778	3,167	4,463
1993		5,155	656,505	68	692	316,846	2,411	1,060	4,229
1994		1,317	599,770	N/A	6,392	382,650	1,063	505	7,811
1995		6,808	N/A	N/A	N/A	709,299	764	4,284	36,884
1996		4,270	1,043,239	N/A	N/A	485,160	453	2,160	6,309
1997		2,590	N/A	1,306	11,689	601,000	1,350	2,079	3,866
1998		4,137	1,356,412	470	8,971	272,337	83,027	5,680	49,676
1999		715	N/A	N/A	N/A	399,951	17,299	5,472	11,163
2000		764	1,591,419	N/A	N/A	658,688	19,933	2,657	11,643
2001		763	N/A	7,098	5,129	527,391	27,756	9,938	18,424
2002		1,916	945,878	1,688	2,775	539,052	56,737	9,195	19,839
2003		9,355	829,111	N/A	N/A	521,646	9,144	10,911	13,331
2004		947	1,352,335	N/A	N/A	509,017	21,343	14,862	21,638
2005		1,742	1,058,679	2,557	2,898	397,755	20,838	21,511	26,099
2006		2,304	N/A	3,144	6,991	227,985	15,600	19,712	11,659
2007		552	752,275	1,530	10,559	107,253	30,508	4,142	13,138
2008		271	1,116,062	1,330	6,257	39,236	4,806	2,555	4,508
2009		624	830,641	10,272	6,258	30,604	4,350	4,070	2,492
2010		683	693,288	N/A	N/A	121,132	5,860	1,534	2,244
2011		894	895,774	N/A	N/A	170,805	5,654	899	3,688
2012		414	744,604	N/A	N/A	297,294	5,600	3,804	17,668
2013		309	N/A	N/A	N/A	404,269	8,838	7,798	20,015
Average	N/A	2,206	952,705	2,946	6,237	359,613	16,869	6,273	14,127
% of Goal	N/A	51%	38%	147%	57%	48%	25%	5.7%	21%

a Insufficient data are available to estimate natural production of steelhead in the Central Valley other than upstream of Red Bluff Diversion Dam Operational changes at Red Bluff Diversion Dam after 1994 preclude the ability to collect comparable post baseline data for this taxon.

b Mid-water trawl index for young-of-the-year American shad in the Sacramento-San Joaquin River Delta and San Pablo and Suisun bays, 1992-2013.

c Estimated abundance of adult striped bass in the Central Valley's anadromous waters, 1992-2013. Estimates for 2007-2013 are preliminary and subject to change. Years with missing data is due to CDFW survey frequency which is based upon funding.

d Estimated abundance of green sturgeon >40 inches in total length, 1992-2013. Estimates for 2006, 2007, 2008, and 2009 are preliminary and subject to change. Years with missing data is due to CDFW survey frequency which is based upon funding.

e Estimated abundance of 15-year-old white sturgeon, 1992-2013. Estimates for 2006, 2007, 2008, and 2009 are preliminary and subject to change.

N/A indicates: (a) data were not collected that year, or (b) indicates the data that are needed to calculate a production estimate using historical methodologies is currently unavailable.

Table 3. Summary of Progress Towards Completing 289 Final Restoration Plan Actions and Evaluations by Watershed, FY 1992-2014

Watershed	Total actions and evaluations in Final Restoration Plan	Actions and evaluations completed to date	Actions and evaluations addressed in 2013	% of actions and evaluations completed to date
American River	13	2	1	15
Antelope Creek	2	0	1	0
Battle Creek	12	8	3	67
Bear Creek	2	0		0
Bear River	8	0	1	0
Big Chico Creek	10	3		30
Butte Creek	39	32		82
Calaveras River	6	0	1	0
Central Valley-Wide	15	1	4	7
Clear Creek	7	5		71
Colusa Basin Drain	2	0		0
Cosumnes River	9	2	2	22
Cottonwood Creek	5	1	2	20
Cow Creek	4	0	2	0
Deer Creek	5	0	1	0
Elder Creek	2	0		0
Feather River	12	0	1	0
Merced River	8	0	4	0
Mill Creek	5	1	1	20
Miscellaneous Small Tributaries	1	0		0
Mokelumne River	13	1	1	8
Ocean	3	0		0
Paynes Creek	2	0		0
Upper Mainstem Sacramento River	22	8	2	36
Sacramento-San Joaquin Delta	29	0	4	0
Mainstem San Joaquin River	13	0	1	0
Stanislaus River	9	1	4	11
Stoney Creek	1	0		0
Thomes Creek	6	2		33
Tuolumne River	10	0	2	0
Yuba River	14	0	4	0
All Watersheds[1]	**289**	**67**	**42**	**23**

[1] Actions to be implemented CVP-wide via tools identified in AFRP Final Restoration Plan.

Salmon natural production numbers were higher in 2013 (7,798 naturally produced fish) than during the recent trend related to poor returns from 2007-2012 (6-year average of 2,834 naturally produced fish). In 2013, Spring-run Chinook Salmon natural production (20,015 naturally produced fish) reached the highest level since 2005. In recent years, Fall-run Chinook Salmon natural production had decreased to below baseline levels due to the recent stock collapse observed from 2007-2010 however, the 2013 natural production estimate (404,269 naturally produced fish) is the highest since 2004 and brings the doubling period average nearly back to the baseline value. Late fall-run Chinook Salmon natural production averaged 5,254 fish between 2008 and 2012, but a modest increase in production was observed in 2013 (8,838 naturally produced fish).

Table 2 shows the yearly estimate of natural production for each anadromous fish species since 1992 and Table 5 shows the average natural production estimate of Chinook Salmon in each watershed from 1992-2013. Available data are insufficient to estimate natural production of steelhead in the Central Valley. Monitoring data for white and green sturgeon in San Pablo and Suisun bays are available for eleven years and ten years, respectively, between 1992 and 2009. The FRP production target for 15-year-old white sturgeon was met once while the production target for green sturgeon >40 inches (total length) was met in 2001, 2005, 2006, and 2009. The California Department of Fish and Wildlife midwater trawl index for juvenile American shad in the Sacramento-San Joaquin River Delta and San Pablo and Suisun bays suggests the FRP production target for this species was met in three of 21 years between 1992 and 2013. The 2013 midwater trawl index for this species (309) decreased from 2012 (414), and the 2013 index was markedly below the 1967-1991 baseline average of 2,129 shad and the FRP production target of 4,300 shad. Monitoring of legal-size striped bass in the Central Valley's anadromous waters has occurred in 16 out of 21 years between 1992 and 2012 and the FRP production target has not been met in any of those years.

About 23% of all Final Restoration Plan actions and evaluations (67/289) have been completed between 1992 and 2013 (Table 3). Of the 105 projects identified by the Program Assessment Rating Tool (PART) as high and medium priority structural actions and evaluations in the Restoration Plan, 73 (70%) have been completed. Of the 128 actions identified in CPAR, forty-six (36%) have been completed (Table 4). One structural action, identified as one of the 105 PART actions, was completed in FY2014 with the completion of construction at the Merced River Ranch Floodplain and Channel Restoration Project in November 2013. Although no other structural or non-structural actions were completed in FY2014 due to the limited availability of funds, 38 separate actions and evaluations to address high priority limiting factors in 20 separate watersheds continued, including fish passage, entrainment, habitat restoration, and spawning gravel augmentation projects as well as variety of assessments and evaluations that are providing information critical for future projects.

Accomplishments in the Sacramento Basin

American River

Work to further refine a structured decision making (SDM) prototype model continued to assist in selecting the best actions for restoration given existing conditions (e.g., spawning versus rearing habitat restoration). Additional spawning and side channel habitat was restored in FY2014 with the addition of gravel and improvement of approximately 1.5 acres of spawning habitat. Additionally, a 350-yard-long side channel was created along the south side of the river to provide juvenile rearing habitat. These efforts are co-implemented with the 3406(b)(13) program, U.S. Fish and Wildlife Service (USFWS), U.S. Bureau of Reclamation, U.S. Army Corps of Engineers (ACOE), California Department of Fish and Wildlife (CDFW), and the Sacramento Area Water Forum.

Antelope Creek

The Juvenile Fish Passage Improvement Project at Edwards Diversion Dam (Central Valley Evaluation 11) will prevent out-migrating salmonids from becoming entrained in the two diversion canals. The Technical Advisory Committee has met with the diverters to determine the most feasible alternative. Substantial progress on a final report of the project's history and documentation of data gaps discovered during detailed design discussions was made in 2014. This project is a cooperative effort between the USFWS, National Marine Fisheries Service (NMFS), CDFW, and the Tehama County Resource Conservation District.

Battle Creek

The Battle Creek Salmon and Steelhead Restoration Project will restore approximately 42 miles of habitat in Battle Creek and an additional 6 miles of habitat in its tributaries. AFRP staff is heavily involved in the coordination and planning of the larger restoration efforts and individual related projects and planning actions. Of the nine Bureau of Reclamation (USBR) contracts that constitute Phase 1A and 1B, seven have been awarded. At the Wildcat Dam & Canal site, both the dam & canal have been removed and the associated road repair is completed. A new fish screen and bypass is in place at Eagle Canyon Dam (Actions 2, 6, and 7). The additional pending work has been delayed to be completed until 2016. This project is a cooperative effort among the U.S. Department of the Interior,

Table 4. Summary of Progress Towards 128 High and Medium Priority "Time Certain" Actions (53 Structural, 75 Non-Structural)

Watershed	53 Structural Actions		75 Non-structural Actions	
	Number of structural actions completed in FY 2014	Number of structural actions completed since 1992	Number of non-structural actions completed in FY 2014	Number of non-structural actions completed since 1992
American River		1		1
Battle Creek		3		2
Big Chico Creek		1		1
Butte Creek		13		17
Clear Creek		1		
Cosumnes River				1
Cottonwood Creek		1		
Mill Creek		1		
Stanislaus River				1
Thomes Creek				2
All Watersheds		**21**		**25**

* NOTE: Although structural or non-structural actions were not completed in FY 2014, work continued on 20 watersheds throughout the Central Valley.

Table 5. Average Natural Production Numbers in Each Watershed Compared to the AFRP Doubling Goal Targets, 1992-2013

Watershed	Species	Doubling Goal Target	1992-2013 Average Natural Production Numbers	Percent of Target
American River*	Fall-Run	160,000	104,296	65.2
Antelope Creek	Fall-Run	720	0	0
Battle Creek*	Fall-Run	10,000	17,564	175.6
Bear River	Fall-Run	450	N/A	N/A
Big Chico Creek	Fall-Run	800	N/A	N/A
Butte Creek	Fall-Run	1,500	2,288	152.5
Clear Creek	Fall-Run	7,100	10,956	154.3
Cosumnes River	Fall-Run	3,300	768	23.3
Cottonwood Creek	Fall-Run	5,900	2,145	36.4
Cow Creek	Fall-Run	4,600	2,117	46.0
Deer Creek	Fall-Run	1,500	898	59.9
Feather River*	Fall-Run	170,000	94,314	55.5
Merced River*	Fall-Run	18,000	6,484	36.0
Mill Creek	Fall-Run	4,200	1,896	45.1
Miscellaneous Creeks	Fall-Run	1,100	78	7.1
Mokelumne River*	Fall-Run	9,300	8,731	93.9
Paynes Creek	Fall-Run	330	N/A	N/A
Sacramento River	Fall-Run	230,000	69,069	30.0
Stanislaus River	Fall-Run	22,000	5,167	23.5
Tuolumne River	Fall-Run	38,000	6,474	17.0
Yuba River	Fall-Run	66,000	30,670	46.4
Central Valley Wide	Fall-Run	750,000	359,613	47.9
Battle Creek*	Late-fall-Run	550	676	122.9
Sacramento River	Late-fall-Run	68,000	16,964	24.9
Central Valley Wide	Late-fall-Run	68,000	16,869	24.8
Butte Creek	Spring-Run	2,000	10,327	516.3
Deer Creek	Spring-Run	6,500	1,949	30.0
Mill Creek	Spring-Run	4,400	1,198	27.2
Sacramento River	Spring-Run	59,000	653	1.1
Central Valley Wide	Spring-Run	68,000	14,127	20.8
Calaveras River	Winter-Run	2,200	0	0
Sacramento River*	Winter-Run	110,000	6,273	5.7
Central Valley Wide	Winter-Run	110,000	6,273	5.7
TOTAL	**All races**	**990,000**	**396,881**	**40.1**

* Watersheds that contain a fish hatchery.

USBR, USFWS, NMFS, CDFW, and the Pacific Gas and Electric Company (PG&E).

Bear River
The quality of anadromous salmonid habitat and presence of passage barriers were assessed in a 4-mile reach of Dry Creek beginning at the Beale AFB boundary and moving upstream. Mesohabitat units were identified and mapped, and shapefiles were generated. The percentage of spawning gravel and percentage of bank with woody cover for each mesohabitat was recorded. Results are documented and discussed in a final report. Additionally, AFRP staff is investigating a recent report of the potential occurrence of an acoustically-tagged White Sturgeon entering the watershed and will proceed accordingly if the report is confirmed.

Cottonwood Creek
In 2014, AFRP staff finalized plans and required permitting for the South Fork Cottonwood Creek Fish Passage Improvement Project (Central Valley Evaluation 11). The project was planned to be implemented in late FY2014, but has been delayed due to the limited availability of helicopter support needed to move equipment (delay is related to wildfires throughout the region during this time). This project is a cooperative effort between the USFWS, CDFW, USBR, NMFS, and the landowner.

Significant work on the Cottonwood Creek Sediment Budget and accompanying report was made during FY2014 and a draft report is anticipated by the end of the calendar year.

The Cottonwood Creek non-native (invasive) plant management and control was completed in 2014. Additional treatments were implemented in South Fork Cottonwood Creek and a final report for the entire project has been submitted.

Cow Creek
Substantial field work was completed on the Cow Creek Riparian Assessment Project. A draft final report including restoration recommendations is expected during fall 2014. This is a cooperative project with the USFWS, CDFW, and the Cow Creek Watershed Group.

Work continued on the Cow Creek anadromous fish passage barrier assessment originally funded in 2011. Field surveys continued in 2014 as additional landowner access allowed. A barrier database, GIS layers and draft final report are ongoing. This is a cooperative project with the USFWS, CDFW, Cow Creek Watershed Group, and the Western Shasta Resource Conservation District.

AFRP staff remain engaged in the Clover Creek Fish Passage/Millville Diversion Dam Restoration Project. The design and initial permitting for this project was completed in 2013 and additional efforts to finalize and compete implementation are underway. This project will open up 10 miles of historic habitat to fall-run Chinook salmon and steelhead (Action 3). This is a cooperative project with the USFWS, CDFW, the California Department of Water Resources (CDWR), the Natural Resources Conservation Service, and the Millville Ditch Association.

Deer Creek
A design alternatives report for the Lower Deer Creek Falls Fish Passage Improvement Project (Phase 1) was submitted for review by the project's Technical Advisory Group in 2014. The grant recipient is working closely with the National Marine Fisheries Service hydraulic engineer to best address the complexity of the site but still meet ladder passage criteria. A new alternative design is anticipated in late summer/fall of 2014. This project is a cooperative effort between the USFWS, NMFS, USBR, CDFW, and the Deer Creek Irrigation District.

A cooperative agreement was finalized in late 2013 to begin work on the Deer Creek Irrigation District Dam Fish Passage Project. In 2014, local landowners were contacted and facilities access agreements were initiated.

Feather River
Monitoring activities targeting green sturgeon did not occur in 2014 due to low water conditions. As a result, an additional year of monitoring was added and will occur in 2015 as conditions allow. This is a cooperative project between the USFWS and CDWR. Additionally, AFRP staff remain heavily involved in planning efforts on the Feather River and serve an integral role in coordinated management decisions in this watershed.

Mill Creek
The Mill Creek fish passage assessment and restoration project was funded in FY2011 and additional funding to complete the environmental permitting was modified into the agreement on September 2013 (Evaluation 1). In 2014, 90% designs are in process for the siphon and Ward Dam sites. Agreement on the proposed alternative for both sites has been made. The Upper Dam still has to have agreement on the screening alternative which should be reached by the end of FY2014. Once this is agreed upon, 50% designs will be submitted for the Upper Dam fish ladder and screens. This is a cooperative project between the USFWS, CDFW, Los Molinos Mutual Water Company, and the Mill Creek Conservancy.

Substantial field work was completed in 2014 on the Mill Creek Riparian Assessment Project. A draft final report including restoration recommendations is expected during fall 2014. This is a cooperative project with the USFWS, CDFW, and the Mill Creek Conservancy.

An Interagency Agreement was established in 2013 to set up a network of acoustic receivers in the Mill and Deer Creek tributaries to the Sacramento River and implement a study that will assess reach specific survival rates of juvenile Chinook salmon from the Upper Sacramento River to the Delta. In 2014, Battle Creek was added to the study and juvenile salmon were collected and tagged in the spring on both Mill Creek and Battle Creek. Data from the receivers has been downloaded and is under analysis. This study is being co-implemented by the USFWS, NMFS, the CDFW Ecosystem Restoration Program, and UC Santa Cruz.

Sacramento River

The mainstem Sacramento River redd monitoring project provided managers the ability to make management recommendations to prevent dewatered redds on nearly a "real-time" basis. Seventy-three miles of the mainstem Sacramento River were monitored for redd dewatering and juvenile stranding. Based on population estimates, about 0.2% winter, 3.1% fall/spring mixed, and 1.2% late-fall-run Chinook salmon redds were dewatered to various degrees. Maintaining stable flows during egg incubation and emergence are important to reduce negative impacts to fall run and late-fall run Chinook salmon and steelhead fry production on the mainstem Sacramento River. This project is a cooperative effort between the USFWS, CDFW, CDWR, and Pacific States Marine Fisheries Commission.

Additionally, substantial progress has been made on efforts to determine the potential impacts, and/or the degree of impact, to northern California aquatic resources, specifically anadromous fish, posed by illegal marijuana cultivation activities. In the summer of 2014, site visits and data collection were completed on multiple upper Sacramento River tributaries.

Yuba River

Monitoring growth and survival of the 5 acres of cottonwood and willow pole cuttings planted on Hammon Bar in FY2012 and FY2013 continued in FY2014. Water depths and velocities during inundation also were measured. A draft long-term monitoring plan was developed that is intended to assess plant survivorship and structure, sediment and organic material deposition, understory plant composition, groundwater and surface water patterns, and fish and macroinvertebrate abundance and diversity. The planting area is intended to flood periodically under moderate flows and thus provide juvenile salmonids with improved rearing habitat (Evaluation 4). This project is a cooperative effort between the USFWS, CDFW, Bureau of Land Management (BLM), Americorps, Western Aggregates, PG&E, and the South Yuba River Citizens League. PG&E is cost sharing $50,000 of the total project cost.

The Yuba River Study Utilizing the Spawning Habitat Integrated Rehabilitation Approach (SHIRA) has led to a detailed map and 2-D model of the lower Yuba River. Mapping of the final reach (i.e., the Narrows) was completed as part of a related AFRP project. Reports assessing the 2013 data were presented at the Lower Yuba River Accord Symposium on July 15, 2014. AFRP staff continued to be an active participant on the Yuba Accord RMT providing technical expertise on anadromous fish habitat restoration and guiding future restoration efforts with the SHIRA model. This project is a collaborative effort between the USFWS, NMFS, Army Corps of Engineers (ACOE), Yuba County Water Agency (YCWA), and the University of California at Davis. ACOE provided $100,000 and YCWA contributed $30,000 in cost-share to further refine the model.

Vaki Riverwatcher systems continue to be operated on the north and south fish ladders at Daguerre Point Dam in the lower Yuba River. The collection of fish passage data continues to improve understanding about the timing, abundance, population trends, and response to changing flow and temperature conditions of adult spring and fall-run Chinook salmon and steelhead. Reports assessing the 2013 data were presented at the Lower Yuba River Accord Symposium on July 15, 2014. AFRP staff continued to be an active participant on the Yuba River Management Team providing technical expertise on anadromous fish population monitoring. This project is a collaborative effort between the USFWS, NMFS, ACOE, CDFW, YCWA, and the Pacific States Marine Fisheries Commission. YCWA provided $120,000 for in-kind services to operate and maintain the fish counting systems on both ladders at Daguerre Point Dam.

Accomplishments in the San Joaquin Basin

Calaveras River

In-water work at the Caprini Low Flow Crossing Fish Passage Project was completed last fiscal year in September 2013 and additional project elements were completed during October 2013. Passage opportunities were limited during FY2014 due to low water conditions but steelhead were observed passing the site without delay on the one occasion when the

river was reconnected to a degree that allowed them to enter the system. This project restored access to about 6 miles of habitat (Action 3). Additional design work was required at the California Central Traction Railroad crossing site due to safety concenrs. Additional funding has been obligated and the project is scheduled to be implemented in 2015. The Calaveras River projects are a cooperative effort between the USFWS, CDFW, CDWR, Stockton East Water District, Fisheries Foundation of California, and the University of the Pacific. Stockton East Water District is cost-sharing $200,000 of the total project cost.

The 4th annual Calaveras River Education and Appreciation Day was held on November 2nd, 2013. Approximately 35 students from A.A. Stagg School in Stockton attended the event. Additionally, more than 10 local experts in a wide array of natural resource disciplines were able to interact with the students in a variety of educational activities. This is an annual cooperative effort by USFWS, USACE, Friends of the Lower Calaveras River, Defenders of Wildlife, University of the Pacific, Fisheries Foundation of California, A.A. Stagg High School, and local Audubon and Sierra Club chapters.

Cosumnes River
Unexpected delays related to adjacent landowner responses to the NEPA permitting for the Cougar Wetland Floodplain Restoration Project have caused a delay in implementation until FY15. Those concerns are being addressed by the project team and implementation is expected to start in summer 2015. Aquatic and terrestrial habitat assessments occurred in FY14. This project is a cooperative effort between the USFWS, CDWR, Ducks Unlimited, ACOE, and BLM. Ducks Unlimited and the ACOE cost shared an estimated $800,000.

Merced River
AFRP staff continued to administer the rotary screw trap monitoring agreement with Merced Irrigation District. This project documented the number of juvenile salmon and steelhead that outmigrated from the Merced River in 2014. Estimates of juvenile salmonid production were calculated and the existing outmigration database was updated. Additional data to assess effectiveness of flow management and habitat restoration projects was collected.

Designs and permitting for the Merced River floodplain and channel restoration project at Snelling (Action 3) were completed in 2013. The objective of the project is to improve spawning and rearing habitat for juvenile salmonids on the Merced River by restoring areas degraded by gold mining operations. Due to lack of funding in 2014 construction was delayed until 2015, permit required monitoring was continued. This project is a cooperative effort between the USFWS, CDFW, and Merced County.

The final construction activities on the Merced River Ranch Project were completed in November 2013. Post project monitoring was scheduled to occur in 2014 but was delayed due to lack of funding. This project is a cooperative effort between the USFWS, CDFW, Merced County, and the Merced Irrigation District.

The AFRP continued to participate in the FERC proceedings for the Merced Falls (P-2467) and Merced River Hydroelectric (P-2179) Projects (Actions 1 and 2; Evaluations 1 and 3). AFRP participated in multiple relicensing meetings in FY2014. Staff reviewed and provided comments on the Updated Study Report and various Technical Memorandums on channel armoring, IFIM habitat modeling, temperature criteria, water balance operations models, and egg viability. AFRP is actively participating in the Merced River Technical Advisory Committee and developing ongoing partnerships with numerous stakeholders in the watershed.

Mokelumne River
Ongoing habitat assessments and modeling of the treatment reaches and downstream affected areas has been completed for the Mokelumne River Spawning Habitat Improvement Project (Actions 2 and 7). This project area is rigorously characterized and monitored each year for spawning use, bed form and function and provides a foundation project for the Spawning Habitat Integrated Rehabilitation Approach (SHIRA). The final report for the 2009-2013 activities was completed in early FY2014. Due to limited funding availability, this project has yet to be funded in FY14 and no new gravel placement has occurred. Ongoing habitat assessments and modeling of the treatment reaches and downstream affected areas has been completed. Additional sources of appropriate gravel have been identified during FY14 and final permitting is nearly complete for up to 5 years of additional implementation. This project is a cooperative effort between the USFWS and the East Bay Municipal Utility District (EBMUD).

In FY2014, AFRP staff worked with the EBMUD and other signatories of the Lower Mokelumne Joint Settlement Agreement to adaptively manage the system and coordinate fall pulse flows (about 5,000 acre feet) with Delta Cross Channel (DCC) operations in an effort to improve adult Chinook salmon returns (Delta Evaluation 5). The DCC gates were not closed in October of 2013 due to low flow conditions and water quality concerns in the South Delta. This project is a cooperative effort between the USFWS, NMFS, CDFW, Woodbridge Irrigation District, and the EBMUD.

San Joaquin River
AFRP staff partnered with the CDFW to maintain VEMCO™ acoustic receivers in the San Joaquin River and continue an annual white sturgeon population assessment. AFRP deployed egg mats to identify sturgeon spawning habitat. No eggs were collected during the 2014 sampling season and it is likely that very little or no spawning occurred in the study area. This may be due to the low river discharge, high water temperatures, and a lack of spring rains. Understanding the conditions that result in sturgeon spawning continues to be an active area of research and will allow us to develop better water management recommendations needed to increase recruitment and abundance of this important CVPIA focus species. Additionally, 15 white sturgeon were captured and implanted with acoustic transmitters in the spring of 2014. Movements of these fish were tracked to learn more about the spatial and temporal distribution of white sturgeon in the San Joaquin River. Also, the AFRP partnered with USGS to map habitat-related physical characteristics along the San Joaquin River with a multibeam sonar, acoustic Doppler current profiler, and RTK-GPS, unfortunately due to low water levels the habitat mapping could not take place.

A manuscript has been developed and submitted for peer-review describing the evaluation of effects of fin ray removal on growth, survival and swim performance of White Sturgeon. Fin rays continue to be collected from angler-harvested fish and those captured by CDFW during annual bay monitoring efforts. When funding becomes available, these rays will be used to evaluate population age and growth characteristics, previous life history information, and inform restoration and management actions. Fin rays, stomachs, gonads, and blood samples were collected from 26 angler harvested fish and are being analyzed for histology, contaminants, and age and growth. Analyses are on hold due to lack of FY14 funding. Results of all analyses will be used to identify and prioritize restoration and management actions.

Stanislaus River
FY 2014 accomplishments included the collection of both juvenile and adult passage data via rotary screw trapping (juveniles)(CAMP) and a fish counting weir (adults) operated in partnership with Tri-Dam. A report summarizing the FY13 salmonid production data was completed. The third year of the Chinook salmon juvenile acoustic study was completed this year and the annual report was submitted. Juvenile salmon were radio tagged and tracked using both fixed and mobile detectors. The study will identify geographic sources of mortality for juvenile salmonids within the migratory corridor and evaluate the effectiveness of improving survival with a spring pulse flow. These studies assist with evaluating benefits resulting from habitat restoration actions. Tri-Dam cost shared about $150,000 for the operation of the rotary screw traps from January 1st to June 15th, 2013 and the fish counting weir from September 11, 2012 to June 30, 2013.

A construction summary report of the Lancaster Road Floodplain and Side-channel Restoration Project was completed in late 2013. Additional post-project monitoring was undertaken and results were presented at professional conferences in FY2014. Post-project monitoring which included vegetation surveys, channel velocity and depth profiles, channel bathymetry and floodplain topographic surveys, benthic macro-invertebrate sampling, fish population monitoring, and substrate quality assessments were also completed for the Honolulu Bar Floodplain Restoration Project. These projects were designed to increase juvenile salmonid rearing habitat and decrease predation (Action 2). The Stanislaus River floodplain restoration projects were implemented in partnership with ACOE, Oakdale Irrigation District, Cramer Fish Sciences, FishBio, River Partners, and CDFW.

Planning documents and design alternatives were developed for the Knights Ferry Floodplain Restoration Project and the Buttonbush Floodplain Restoration Project (Action 2). Pre-project monitoring data was collected to characterize the pre-project habitat conditions including water depth and velocities, substrate size distribution, and biological data. Topographic and bathymetric surveys were also completed to be used to further refine design alternatives. These projects are a cooperative effort between the USFWS and the ACOE.

The Fifth Annual Stanislaus River Salmon Festival was held on October 26, 2013 at the Knights Ferry Recreation Area, with AFRP staff heavily involved in the organization and implementation of the event. An estimated 1,800 attendees joined in the multiple activities offered as part of the event. The East Stanislaus Resource Conservation District, Modesto Junior College, Great Valley Museum, FishBio, U.S. Army Corps of Engineers, and both Oakdale and Knights Ferry schools played key roles in organizing the event.

Tuolumne River
Post-project monitoring at the Bobcat Flat Restoration Project sampled fish through snorkel and seine surveys and benthic macro-invertebrate sampling in the constructed floodplain and side-channel in the Tuolumne River (Action 2). The Bobcat Flat Restoration Project restored 8 acres of highly disturbed floodplain and about 1.6 miles of fall run Chinook salmon and Central Valley steelhead spawning and

rearing habitat in 2011. Adult and juvenile salmon were observed using the improved habitat October 2013 - May 2014. The Final Report was completed in 2014. This project was a collaborative effort between USFWS, CDFW Ecosystem Restoration Program, and Friends of the Tuolumne River.

The AFRP continued to participate in the FERC proceedings for the Don Pedro Hydroelectric Project (P-2299) (Actions 1 and 6; Evaluations 1, 2, 3, and 4). AFRP participated in multiple relicensing meetings in FY2013 and submitted study proposals for Floodplain Habitat Modeling, juvenile Chinook salmon and predator acoustic telemetry studies, and a predator mark and recapture study. Staff also provided detailed comments on the Don Pedro FERC Initial Study Report and on the Don Pedro Chinook Population Model. AFRP is collaborating with numerous stakeholders in the watershed through the relicensing process to develop conceptual models and evaluate the limiting factors and fishery resources in the Tuolumne River.

Tracy (Jones) Pumping Plant Program 3406 (b)(4)

The Tracy (Jones) Pumping Plant's six pumps, each capable of pumping between 800 - 1000 cfs into the Delta Mendota Canal, are powerful enough to alter stream flow in the Delta and the San Joaquin River Basin. This disorients migratory fish and draws them toward the pumps where they can become entrained, or trapped.

To mitigate entrainment, the Tracy Fish Collection Facility (TFCF), located upstream of the pumping plant, collects migratory fish and transports them to the Delta where they can resume outmigration to the ocean. The focus of the (b)(4) program is to improve fish protection and salvage through development of new technologies. Ongoing monitoring of the program's effectiveness helps define best practices that inform decision-making and long-term planning at Tracy and other South Delta facilities.

Performance Measures

The Tracy (Jones) Pumping Plant program (TPPP) develops and implements actions to mitigate impacts to fisheries, targeting the 23 actions included in The Tracy Fish Facility Improvement Program Plan, as shown in Table 6. As of this year 17 of the 23 actions have been completed.

FY 2014 Accomplishments

The program obligated $1,125,000 from Water & Related Resources fund for the TFCF, with no funds contributed from the Restoration Fund.

Actions to Improve Tracy Fish Collection Facility

By far the greatest accomplishment was the Secondary Louver Replacement project, Action 18, awarded at the end of last fiscal year and implanted in the Spring/ Summer 2014. Installation of the secondary channel fish screen and debris handling system was completed in July 2014, in effect becoming a prototype for Action 17. Also, work continued on design details towards eventual completion of Action 19, which will result in the development of land to better Reclamation's ability to conduct research onsite and improve fish protection at the TFCF. Replacement of the secondary transfer system, Action 20, to improve hydraulic control and fish transfer will be delayed to 2018, accommodating the new screening system testing and the need for RAX Program funding.

The program continued assessments, search of land records and initial reconnaissance was conducted in support of Action 23, the third release site. In addition Reclamation partnered with the State of California on the physical modeling of fish release pipe configuration at the DTSC. This research will be incorporated into the ultimate design for the third release site.

In addition to the 23 actions listed in Table 6, the program also completed a number of studies that will improve fish capture and reintroduction capabilities. The studies include a continuation of data evaluation related to the salvage efficiency tests for salmon, and evaluation of predatory impacts within the secondary system of the TFCF. Predation studies continued with the evaluation of the use of carbon dioxide as an alternative predator removal technique to decrease TFCF predator numbers as well as the investigation of the use of fish traps and bait attraction of predator fish. The research group advanced the state of the art of acoustic tag technology by evaluating the influence of tags on susceptibility to predation and evacuation rate in several species.

Reclamation also evaluated the holding tank screen retention efficiency for juvenile delta smelt. The research group also completed studies of the effects of fish density on water quality in the haul-out bucket and fish-haul trucks at the TFCF.

Some of these studies are related to specific RPA action items and some are included in the facility assessment program. The facility assessment program is needed in order to understand present day operational characteristics so as to have a baseline to compare improvements to and also figure out which technologies and concepts to apply to the eventual physical improvements.

Tracy Fish Facility Improvement Program Publication for FY2014:

- **Tracy Technical Bulletin 2014-1**
  Zachary A. Sutphin and Connie Svoboda. 2014. Effects of Life-Stage and Origin (Wild or Hatchery) on Delta Smelt Secondary Channel Efficiency at the Tracy Fish Collection Facility. 25 pp.
- **Tracy Technical Bulletin 2014-2**
  Zachary A. Sutphin. 2014. Effects of Removing Primary Channel Adult Striped bass on Delta Smelt Salvage Efficiency. 29 pp.
- **Tracy Technical Bulletin 2014-3**
  Brandon J. Wu and Brent B. Bridges. 2014. Retention Efficiency of the Tracy Fish Collection Facility Holding Tank Screens for 20–30 mm Fork Length Juvenile Delta Smelt during 30-Minute Fish Counts. 35 pp.

- **Tracy Research Series Volume 49**
  Brandon J. Wu and Brent B. Bridges. 2014. Evaluating the Use of Carbon Dioxide as an Alternative Predator Removal Technique to Decrease Tracy Fish Collection Facility Predator Numbers and Improve Facility Operations. 61 pp.
- **Tracy Research Series Volume 50**
  Brandon J. Wu and Brent B. Bridges. 2014. Evaluation of a New Technique to Remove Debris from Holding Tanks at the Tracy Fish Collection Facility. 33 pp.
- **Tracy Research Series Volume 51**
  Zachary A. Sutphin, Rene C. Reyes, and Brandon J. Wu. 2014. Predatory Fishes in the Tracy Fish Collection Facility Secondary System: An Analysis of Density, Distribution, Re-colonization Rates, and Impact on Salvageable Fishes. 69 pp.

Table 6. Summary of Progress Towards 23 Tracy Fish Facility Improvement Program Plan Actions

	Actions	Start Date	Completion Date
1	Implemented periodic predator removals	1992	“ongoing”
2	Upgraded instrumentation at the TFCF	1992	1993
3	Replaced high pressure utility pump with low pressure utility pump	1995	1996
4	Epoxy coated recessed collection tanks	1997	1997
5	Constructed aquaculture facility onsite	1997	2005
6	Constructed extraction device for Chinese mitten crabs/debris removal	1998	1999
7	Installed air system in recessed collection tanks	1999	1999
8	Developed onsite laboratory for fish taxonomic work	1999	1999
9	Added air system to fish haul trucks	2000	2000
10	Upgraded fish count area to accommodate DNA sampling & fish ID	2000	2000
11	Updated fish identification key for training of operators	2000	2000
12	Replaced worn (“leaky”) bypass transition boxes	2003	2004
13	Replaced fish transfer bucket with new/improved fish transfer bucket	2006	2008
14	Replaced fish haul trucks with new/improved fish haul trucks	2006	2008
15	Constructed new biological resources building	2006	2010
16	Replaced existing trash rack cleaner with new/improved trash rack cleaner	2006	2010
17	Replace primary louvers/cleaners with new primary louvers/ cleaning system	2006	2017*
18	Replace secondary louver/cleaners with new secondary louvers/ cleaning system	2006	2014
19	Develop land onsite to improve ability to conduct research and operate the facility	2006	2018*
20	Construct new secondary screening and transfer system	2010	2018*
21	Construct new aquaculture facility onsite	2012	2020*
22	Automate velocity control pumps for the fish bypass system	2013	2016*
23	Construct third fish release site	2014	2016*
* Estimated Completion Date			

Clear Creek Restoration Program 3406 (b)(12)

Clear Creek suffered widespread degradation through the 20th century due to several factors, including construction of McCormick-Saeltzer Dam in 1903, construction of Whiskeytown Dam in the 1960s, and aggregate and gold mining activities. These actions led to precipitous drops in Chinook salmon and steelhead spawning, and juvenile production. Section (b)(12) calls for a restoration program to improve instream habitat, allowing greater spawning and rearing success.

Performance Measures

The Clear Creek Restoration Program (CCRP) focuses on the following areas and uses the following goals to track progress: fish passage; erosion control; gravel placement (creation of spawning habitat); channel restoration; instream flow and temperature of flow releases. All of these goals are in support of the overall CCRP objective of restoring fish populations in Clear Creek, and increasing natural production, to meet the annual target of 7,100 for fall-run Chinook in Clear Creek. Although there is no doubling target for spring run Chinook on Clear Creek, restoration actions will also help increase spring-run Chinook populations, contributing to the CVPIA's Central Valley-wide goals.

Fish Passage – The fish passage target was achieved in 2000, when McCormick-Saeltzer Dam was removed, opening 12 additional miles of habitat to fish passage and upstream spawning.

Erosion Control – The erosion control target was achieved ahead of schedule. All feasible and cost effective erosion control projects initially identified were completed by 2001 and at that time, the necessity for further work would be subject to future needs. Since that time, the Clear Creek watershed has experienced two major wildfires, the Moon Fire in 2008, and the Dale Fire of July 2012. The federal and state lands affected by the Dale Fire have been subject to some post-fire stabilization measures such as grass-seeding, straw mulching, replanting, and other erosion reduction efforts. The Clover Fire of September 2013 affected the Cottonwood Creek drainage and also burned a smaller area within the Clear Creek watershed. There were no major conflagrations during the summer of 2014. The potential impacts to Clear Creek are not yet fully known.

Gravel Placement (Creation of Spawning Habitat) – The CCRP attempts to replenish Clear Creek spawning habitat areas with 25,000 tons of gravel every year. Clear Creek spawning gravel replenishment goal was erroneously reported in the Final CPAR, 2009 as 17,000 tons annually. This unit of measure should have been cubic yards. Applying a conversion factor, 17,000 cubic yards of spawning gravel equates approximately to 25,000 tons. This correction first occurred in the 2012 Accomplishment Report and therefore, the percentage of annual goal for this year forward will appear smaller than past years of the same amounts of gravel. Gravel placement contributes to the restoration of the 347,288 square feet of spawning habitat that existed before the construction of Whiskeytown Dam.

Channel Restoration – The CCRP is restoring 2 miles of stream channel to support successful spawning and rearing.

In-stream Flows and Temperature of Flow Releases – The CCRP provides instream flows, depending on hydrology and biological conditions, to ensure that flow volumes and temperature meet habitat needs for successful spawning and rearing. Using (b)(2) water and coordinating with operators, the CCRP aims to provide water at 60°F June 1–September 15, and 56°F September 16–October. The goal is to meet these targets at least 98% of days, with no more than two consecutive days of releases when exceeding the temperature target. The timing of flows benefit both spring run and fall run Chinook but are especially important to spawning spring run Chinook as they can only spawn in water cold enough to sustain eggs through their incubation period.

Since 1999, studies have been undertaken by CVPIA and CALFED to develop channel maintenance flows, which are vital for providing and maintaining spawning and rearing habitat in Clear Creek. In 2008 FWS and CALFED contracted to facilitate a pilot re-operation of Whiskeytown reservoir to achieve the channel maintenance flow prescription. This Environmental Water Program prescription calls for the re-operation of Whiskeytown Dam, between March 1 and May 15, to produce a Glory Hole spill event that results in a minimum target release of 3,250 cfs for a one-day duration. This event would occur seven times in a ten-year period. Flows of this magnitude and duration could reactivate various fluvial geomorphic processes to re-create and maintain diverse instream and floodplain habitat required to support and recover aquatic and riparian species. This flow prescription is also required in the NMFS OCAP BO.

FY 2014 Accomplishments

In FY 2014, the CCRP obligated $655,000 from the Restoration Fund and no funding from the Water and Related Resources fund.

Chinook Salmon Populations - Although the spring-run population numbers have been in decline, the numbers of spring-run Chinook (SCS) increased from 8 in 2011 to 68 in 2012, and 652 were observed in 2013, the highest since monitoring efforts began in 1998. For 2013, a record number of SCS redds were counted (142), which was the 3 times the average of the previous ten years.

Gravel Placement (Creation of Spawning Habitat) – Spawning gravel was not placed in Clear Creek during FY 2013 due to limited funding, however, for 2014, about 8,000 tons of gravel were placed at four sites.

The second annual evaluation of spawning gravel implementation and monitoring was previously submitted to NMFS as a requirement under the OCAP BO. As a result of studies in 2011 suggesting that gravel sizes specification should be modified in future years to improve use by spring Chinook, a new specification was developed and implemented for the 2012 injections. The FWS conducts on-going monitoring of the spawning gravel and documents the areas being used by salmonids for spawning. These efforts will evaluate the efficacy of the new criteria, and identify whether the criteria needs to be adaptively changed. The monitoring efforts also provides a scientifically-based basis for determining future injection locations and amounts.

Channel Restoration – Phase 3C, the last phase of the restoration project, will be considered for implementation in future years. FWS and BOR began initial efforts to garner funding support from the CVPIA program managers, and the approval of the Clear Creek Technical Team (CCTT) to begin planning efforts for this final phase. The FWS and BOR will start by working on the feasibility design aspects of the project. Thereafter, FWS and BOR will develop a Performance Work Statement to begin the process of securing a contractor to work on the NEPA/CEQA environmental compliance requirements.

Instream Flows and Temperature of Flows – The CCRP met its goal of providing base flows of 200 cfs between October 1–May 31.

The pulse flows conducted in Clear Creek are beneficial in attracting salmon and promoting upstream movement. In the spring of 2014, two pulse flows were provided to help attract spring-run Chinook to Clear Creek. The first event (peak of 423 cfs) began on April 14, 2014 and ended on April 21, 2014. Scheduling complications due to drought contingency operations hindered our ability to conduct monitoring during the first pulse flow event. The second pulse flow began on June 20, 2014, and reached a maximum of 1,110 cfs. Pre- and post-flow fish-passage monitoring was collected during the second higher flow event, and 74 spring Chinook were counted prior to the flow event, and 123 were counted after the flow event, for a relative increase of 66%. Similar flows will occur in future years, as directed by the NMFS OCAP BO.

Water temperature targets were only met 70% of the time due to reduced diversions from the Trinity River Division to the Sacramento River due to widespread drought in California. During the spring Chinook salmon holding period, targets were met 100% of the time, but spawning and incubation period targets from September 15 to October 31 were never met.

In 2012, the juvenile salmonid flow habitat relationships Instream Flow Incremental Methodology (IFIM) draft report was released for peer review. Work continued on bio-validation of the models. The resulting 14 IFIM flow-habitat models is being synthesized (integrated) as the "synthesis report" with population, temperature, and restoration information in 2012 to provide flow prescriptions that optimize habitat needs for all species, runs and life stages of salmonids in the different reaches of Clear Creek, throughout the year. This "synthesis report' is currently in draft form, and upon its completion, the CCTT will provide the report and its recommendations to Reclamation. Reclamation will then submit their recommendations to NMFS for review and approval.

Instream Flows, Environmental Water Program – In FY 2011, CCRP entered into contracts to further the Environmental Water Program which aims to identify and discuss data gaps and uncertainties, understand operational tools, identify resources needed, ensure safety-of-dams considerations, and mitigate for foregone power revenues. Three workshops were conducted during FY 2012. During FY 2013, draft Technical Memorandum documents were provided to the CCRP for initial review. FWS, Reclamation, and CDFW will need to complete formal reviews of these documents to enable their finalization. During FY14, the Core Monitoring and Adaptive Management Plan (CMAMP) was completed by Stillwater Sciences. This CMAMP document will serve as the monitoring plan for the EWP pilot flow release and for longer-term monitoring needs of future EWP flow releases. With the completion of the CMAMP and eventual review of the Technical Memorandums by Reclamation, it is expected that Reclamation will begin formal development of the NEPA/CEQA process.

Adaptive Management and Monitoring

Spawning gravel-size specifications improved based on monitoring – Past spawning ground surveys and spawning habitat suitability surveys identified that Chinook were no longer using the spawning gravel provided by the program in the reach directly downstream of Whiskeytown Dam. Gravel-size distributions suggested that only smaller size gravel was being delivered to spawning areas due to reduced high flows from Whiskeytown Reservoir, and that the size specifications being used for restoration in this area did not contain enough larger material. Therefore gravel size specifications were increased for projects implemented in 2012. Further monitoring will be needed to complete the adaptive management cycle and verify if Chinook use the new gravel. Spawning studies conducted by FWS and geomorphic studies conducted by Graham Matthews and Associates (GMA) also indicated that some spawning gravel projects performed better than others. These results were used to improve projects conducted in 2012 and to prioritize sites for future spawning gravel augmentations. As gravel placement did not take place in 2013, future project efforts will be monitored to evaluate the efficacy of the size criteria which was developed in concert with the CCTT. In 2013, GMA completed the final report for the 2010-2013 Clear Creek Geomorphic Monitoring work. The report contains valuable information that confirms the importance of the seasonal pulse flows in supporting sediment/gravel transport, and provides recommendations on the gravel injection locations, tonnage, and injection frequencies.

Also, GMA re-established a stream gaging station at the "P4" location, which provides strategically valuable information on stream turbidity and flows in the "restoration reach" of lower Clear Creek.

Phase 3b restoration, pedestrian bridge, and Lower Clear Creek Aquatic Habitat and Mercury Abatement Project (LCCAHMAP; formerly long-term gravel supply project) – In 2013, planning activities continued to obtain permits to conduct decommissioning of roads used during habitat restoration activities within the Phase 3B areas, and planting riparian and upland areas. The future decommissioning of roads will reduce the amount of habitat fragmentation. Also, the Horsetown pedestrian bridge was completed. The LCCAHMAP made notable progress during 2014, with the completion of the final EA/EIS. The Initial Study-EA/EIS underwent review in the State "Clearinghouse" by trust agencies, and the public, and several comments were received. Presently, a Biological Asssessment for the LCCAHMAP is under preparation. Final environmental compliance permits and consultation with NOAA Fisheries are anticipated to be completed during latter 2014.

The Long-term Programmatic Permits project also made substantial progress in FY 2014. A Biological Opinion was issued by NOAA-Fisheries, and an Initial Study/Mitigated Negative Declaration (IS/MND) document was submitted to the State "Clearinghouse" for review. Minor comments were received and the CEQA lead agency, the California Regional Water Quality Control Board (CRWQCB) is expected to formally adopt the IS/MND in the fall of 2014.

Monitoring the impacts of wildfire will guide erosion control – The aforementioned 2008 wildfire in the South Fork Clear Creek tributary, and subsequent salvage logging and road building contributed to a significant instream sediment problem. These observations led to topographic surveys to quantify the amount of fine sediment delivered to the creek, bulk sampling to estimate changes in sediment size, and snorkel surveys to locate the downstream extent of sand deposition in pools. These actions indicated that the fine material has been progressively moving downstream and out of the Clear Creek system. It appears possible that the amount of fine sediment has been decreased, perhaps by the multiple pulse flows that have occurred since the fire. Since the 2008 fires, the juvenile productivity of steelhead and spring and fall Chinook had decreased, although it is was not understood why. Recent monitoring by the FWS has indicated that productivity of juvenile salmonids may be increasing. Since the recent 2012 Dale Fire, and the Clover Fire of 2013, monitoring efforts need to continue in Clear Creek system to guide future restoration actions.

Fish and geomorphic monitoring results may improve future pulse flows – Results of past and recent pulse flows suggested that higher flows would provide more favorable geomorphic outcomes. In addition, it was determined that higher flows could have been provided without impacting the ability of the Clear Creek Community Services District to receive water. The CCTT has assisted in adaptively modifying pulse flows in an effort to move more sediment downstream, as well as attracting Spring-run Chinook and stimulating their upstream movement. Therefore in 2013, and 2014, both higher and lower pulse flows were provided. The Clear Creek Technical Team requested that NOAA-Fisheries modify the OCAP RPA I.1.1 to provide more flexibility and aid in adaptive management. The proposal would allow the Clear Creek Technical Team to recommend to NOAA-Fisheries and Reclamation, changes in the timing, magnitude and duration of the spring attraction flows to

better meet objectives of the Clear Creek RPA actions, additional ecosystem goals, operational constraints, and adaptive management. This proposal was prompted by the results from on-going fish, geomorphic, avian and riparian monitoring.

Fish Population Monitoring Suggests Program Success – Monitoring continues to document the overall success of the Clear Creek Restoration Program. No other Central Valley watershed has survived the Chinook fishery collapse nearly as well as Clear Creek. This may be due to increased resilience of the watershed due to CVPIA's habitat restoration. In 2011, fall-run Chinook escapement was 4,841 compared to the average baseline escapement of 1,689 between 1967 and 1991. Escapement appeared lower in 2011 than in the previous 10-years (average of 8,825), in part because the method for estimating escapement was changed. The 2012 fall-run estimate was 7,631. The 2013 escapement was an impressive 13,337; approaching double the AFRP production target (7,100) for Clear Creek.

In addition, populations of threatened spring-run Chinook and steelhead have been re-established in the Clear Creek watershed. The recent CDFW Central Valley Steelhead Monitoring Plan and Central Valley Chinook Monitoring Plan recommended that a counting weir be used in Clear Creek to monitor adult populations of salmon and steelhead. In 2012 CVPIA partnered with CDFW to build and install a fish counting weir in Clear Creek near the confluence with the Sacramento River. The weir was in operation during 2013 by CDFW, using video and DIDSON sonar technology for fish counts. The CDFW Grand-Tab spring-run estimate for 2013 was 659, the highest count recorded in Clear Creek. Also, as previously noted, a record 142 SCS redds were counted in 2013. In 2014, the steelhead redd index was 328, which is 67% higher than the 10-year average. In addition, 68% of all steelhead redds were found in injected gravels, which represents a doubling of the steelhead redds over the past 12 years.

Whiskeytown Oak Bottom Temperature Control Curtain (OBTCC) – The OBTCC has deteriorated in recent years and is no longer functional. Reclamation will be removing the OBTCC during the fall of 2014. To date, there are no definitive plans for the replacement of the OBTCC, although it is anticipated that Reclamation will be listing the replacement action in its RAX (replacement, addition, and extraordinary) system.

The (b)(12) program also supported the development of the inSALMO Salmon Model Project, which was completed in FY 2014, and a peer reviewed paper was produced in the Canadian Journal of Fisheries and Aquatic Science, "Facultative anadromy in salmonids: linking habitat, individual life history decisions, and population-level consequences". This paper was prepared by Steven F. Railsback, Brett C. Harvey, and Jason L. White.

Spawning and Rearing Habitat Restoration Program 3406 (b)(13)

In a free-flowing river, rocks, gravel, dirt and other substrates are continually moving downstream, providing suitable habitat for successful spawning and juvenile rearing. The construction of CVP dams has had a dramatic impact on streams by impeding this natural process.

The (b)(13) program represents a continuous effort to restore spawning and rearing habitat in three Central Valley streams:

- Upper Sacramento River, from Keswick Dam to the Red Bluff Diversion Dam
- American River downstream of Nimbus Dam
- Stanislaus River downstream of Goodwin Dam

The Spawning and Rearing Habitat Program (SRHP) focuses on sites that are thought to have the most potential to increase the quality and quantity of spawning and rearing habitat. Two criteria guide the identification of gravel placement sites: the need for spawning and rearing habitat; and accessibility to the river by heavy equipment, helicopter or sluice to deliver gravel or modify the channel.

Aerial photos, redd (fish egg "nests") surveys, snorkel surveys and boat surveys are used to identify areas for gravel augmentation. Prior to placing gravel or improving rearing habitat, baseline data is collected using aerial photos, topographic surveys, spawning surveys and rearing surveys. Once the projects are implemented, the SRHP monitors the spawning and rearing occurring at and near the restored sites and makes comparisons to pre-project conditions and control sites to determine the program's effectiveness.

The SRHP relies on other river-wide monitoring to evaluate population level effects. This consists of adult escapement surveys (all Reclamation funded) conducted by the California Department of Fish and Wildlife (CDFW) in the Sacramento, American and Stanislaus rivers; juvenile production monitoring conducted by FWS in the Sacramento River (Reclamation funded), FWS and the Pacific States Marine Fisheries Commission in the American River (CVPIA funded), and private contractor in the Stanislaus River (CVPIA funded). Adult escapement and juvenile production monitoring provides information on the number of juvenile emigrants produced per spawner.

Performance Measures

The SRHP places gravel in the Sacramento, Stanislaus and American rivers on an annual basis to improve spawning and rearing habitat (see Table 11). The annual program targets for gravel placement are 10,000 tons on the Sacramento River, 3,000 tons on the Stanislaus River, and 7,000 tons on the American River.

The program monitors the effectiveness of gravel placement by surveying for several indicators. The number of redds per square meter indicates whether salmon find the gravel appropriate for spawning (0.03 redds/square meter is a standard guideline). The level of egg retention in females indicates whether fish are successfully finding suitable sites to spawn and are spawning (less than 10% retention is a standard guideline). The percentage of salmon using emplaced gravel indicates whether the program is providing habitat that is suitable (the program aims for 10% on the Stanislaus River and 25% on the Sacramento and American rivers).

FY 2014 Accomplishments

In FY 2014, the SRHP obligated $500,000 from the Restoration Fund and $683,000 from Water and Related currently accounted for under Bay Delta Activities.

Sacramento River

In 2014, the program continued work on permitting new sites for placing gravel and providing enhanced rearing habitat. No gravel has been placed in 2014. A significant stockpile of nearly 30,000 tons of gravel remains just below Keswick Dam awaiting higher flows to distribute the material downstream. Redd surveys funded separately by Reclamation showed that 71% of the winter-run Chinook salmon spawning occurred upstream of the Anderson Cottonwood Irrigation District diversion dam in 2014. This is the reach affected by gravel injections at Keswick Dam and the section of river with the coolest water to support egg to fry survival.

Stanislaus River

In 2014, no projects were implemented by the program in the Stanislaus River. Monitoring conducted by the program consisted of redd surveys and surveys of downstream movement of previously placed gravel During redd surveys in November and December of 2013, 242 Chinook salmon redds were mapped on the gravel placed in Goodwin Canyon at the float tube pool and cable crossing sites and 54 redds were mapped on the Knights Ferry placement sites. The peak river-wide redd counts on the days that redd mapping occurred totaled 1,261 redds. The redds on these sites made up 23% of the river-wide count. In addition, high densities of rearing juvenile rainbow trout/steelhead, a threatened species in the Stanislaus, were documented rearing at the Goodwin gravel placement sites during snorkel surveys throughout the year. The primary source of gravel to Goodwin Canyon since Goodwin Dam was

built has been the recent gravel placements (over the last 15 years or so) so the cumulative movement of this material can be visually monitored with snorkel surveys in the canyon. A 2013 survey showed gravel accumulations creating spawning habitat 0.2 mile downstream of the placement reach. No gravel has reached the downstream end of the large pool at the old stream gauge site located 0.5 mile downstream of the gravel placement site and one mile downstream of Goodwin Dam.

American River

In 2014, the SRHP placed 10,000 tons of gravel and created 400 yards of side channel habitat in Nimbus Basin, directly below Nimbus Dam. The gravel placement represented 143% of the annual target of 7,000 tons. This project was funded by SRHP and AFRP and included participation by multiple agencies including Reclamation, Fish and Wildlife Service, the Water Forum, City of Sacramento, CDFW, and Sacramento County Regional Parks. The project included a designed channel spanning gravel placement (creating approximately 7,200 square yards of improved spawning habitat) and created a side channel with floodplain habitat to provide Chinook and steelhead spawning and rearing habitats designed to be usable over a range of flows. Woody debris was installed in the channel to enhance rearing habitat for juvenile salmonids.

The program continued development of a decision-support model using the Structured Decision Making approach to help determine the most efficient use of management resources to maximize the number and condition of juvenile salmonids leaving the American River. We improved on the predictive model created in FY12 by quantifying the model functions using data and empirical models and will continue to update the model through focused project monitoring. The finished model is intended to be used as a decision support tool to assist in prioritization of sites for restoration (in-channel, side channel, and floodplain) and the type of restoration action (gravel injection, gravel placement, in-channel or out-of-channel rearing habitat restoration) that will provide the greatest benefit to increase the number of juvenile outmigrants.

Monitoring, using a before-after control-impact framework, was conducted to evaluate the effectiveness of the projects including: hyporheic water chemistry, flow and temperature; gravel movement and river bed changes; Chinook and steelhead spawning habitat use; juvenile salmonid habitat preferences; macro invertebrate production; and floodplain inundation.

Table 7. Gravel Placed by Year in CVP Streams, and Percent of Target, 1997-2014

	Sacramento River (10,000 Ton Target)	% Target	Stanislaus River (3,000 Ton Target)	% Target	American River (7,000 Ton Target)	% Target
1997	31,000	310	2,000	67		0
1998	23,000	230	3,000	100		0
1999	25,000	250		0	6,000	86
2000	32,000	320	1,300	43		0
2001		0	500	17		0
2002	15,000	150	4,000	133		0
2003	8,800	88		0		0
2004	8,500	85	1,200	40		0
2005	7,200	72	2,500	83		0
2006	6,000	60	2,500	83		0
2007	6,000	60	4,100	137		0
2008	8,300	83		0	7,000	100
2009	9,900	99		0	10,600	151
2010	5,500	55		0	16,000	229
2011	5,000	50	5,000	167	20,770	297
2012	15,00	150	3,000	100	24,510	350
2013	14,000	140		0	6,000	86
2014		0		0	10,000	143
TOTAL	**220,000**	**130**	**29,100**	**54**	**100,880**	**80**

Comprehensive Assessment and Monitoring Program 3406 (b)(16)

Pursuant to CVPIA section 3406 (b)(16), the Comprehensive Assessment and Monitoring Program (CAMP) was established to assess the biological results and effectiveness of actions implemented by CVPIA in support of the AFRP's fish production targets. CAMP produces annual reports that compile and synthesize anadromous fish production data from the Central Valley. These data are used to assess the effectiveness of habitat restoration actions such as water management modifications, structural modifications, habitat restoration, and fish screens. CAMP annual reports provide data for 22 Central Valley watersheds, and a broader area that includes San Pablo Bay, Suisun Bay, and the Sacramento-San Joaquin River Delta.

The CAMP depends on other programs and agencies that provide information that the CAMP then synthesizes and summarizes in its annual report. To optimize its program budget, CAMP works with partners whenever possible to complete high-priority monitoring projects.

The CAMP Implementation Plan was developed in 1997. That document describes methods for monitoring nine anadromous fish taxa in California's Central Valley, and provides procedures for assessing the biological results and effectiveness of different categories of restoration activities. The nine anadromous fish taxa in the Plan are: Chinook salmon (fall-, late-fall-, winter-, and spring-run), steelhead, striped bass, American shad, white sturgeon and green sturgeon.

CAMP focuses on three program objectives:

- **Objective #1** – Assess the overall effectiveness of actions implemented pursuant to CVPIA section 3406(b) in meeting AFRP fish production targets.
- **Objective #2** – Assess the relative effectiveness of categories of CVPIA section 3406 (b) actions (e.g., water management modifications, structural modifications, habitat restoration, and fish screens) toward meeting AFRP fish production targets.
- **Objective #3** – Establish a data management program to manage CVPIA data (a resource available to all interested parties), provide training in data management, ensure compliance with relevant federal laws and regulations, and ensure the effective and economical management of resources.

Performance Measures

The CAMP has one performance measure. That measure requires that the program produce one report each year.

The CAMP Implementation Plan identifies 82 monitoring elements that are required to assess progress toward the AFRP fish production targets (CAMP Objective #1). The Plan also provides a framework to assess the biological response to, and effectiveness of, restoration actions (CAMP Objective #2). The program's goals have recently been expanded to consolidate, standardize, and enhance the collection of data related to the CVP ecosystems (CAMP Objective #3).

FY 2014 Accomplishments

In FY 2014, the CAMP received $3,137,000 from the Restoration Fund and $2,531,000 from Water and Related.

The CAMP accomplishments that were completed in FY 2014 are listed below; the accomplishments have been grouped according to the three CAMP objectives. For the CAMP-funded projects where a report was completed, the reports can be accessed on the CAMP website at: *http://www.fws.gov/sacramento/Fisheries/CAMP-Program/Documents-Reports/Documents/2014_CAMP_Annual_Report.pdf.*

CAMP Objective #1

CAMP Annual Report

CAMP produced its 2014 annual report assessing the overall effectiveness of actions implemented pursuant to CVPIA section 3406(b) in meeting AFRP fish production targets.

Constant Fractional Marking Program

Marking and tagging of juvenile fall-run Chinook salmon at the Nimbus Fish Hatchery and Coleman National Fish Hatchery was completed during the spring of 2014. A report describing this activity is being developed and will be posted on the CAMP website when it is finalized. The data from the marking and tagging program is used to quantify the relative proportion of hatchery vs. wild adult Chinook salmon observed during escapement surveys, which in turn leads to the development of more accurate natural production estimates for Chinook salmon.

Quantify Escapement of Adult Steelhead and Spring-run Chinook salmon on Battle Creek

Escapement levels of adult steelhead and spring-run Chinook salmon in Battle Creek at the Coleman National Fish Hatchery weir in late fall, 2013, were

monitored. A report documenting the results of that activity will be produced in 2014.

Quantify Escapement of Adult Winter-run Chinook Salmon on the Sacramento River
Escapement levels of adult winter-run Chinook salmon in the Sacramento River in 2014 were monitored. A report documenting the results of that activity will be produced in 2014 or 2015.

CAMP Objective #2

CAMP Rotary Screw Trap Platform
Development of the CAMP RST Platform continued in 2014. The Platform is now able to produce juvenile Chinook salmon production estimates from the American River, Stanislaus River, and Feather River. Data from the Mokelumne River and Sacramento River at the Red Bluff Diversion Dam have been imported into the Platform and are being modified so they can be analyzed with the Platform's analytical routines.

Monitor Juvenile Chinook Salmon Production on the Stanislaus River at Caswell State Park
Rotary screw traps were operated at Caswell State Park on the Stanislaus River during the 2014 rotary screw trap field season. A report documenting those operations will be completed in the fall of 2014.

Monitor Juvenile Chinook Salmon Production on the American River
Rotary screw traps were operated on the American River during the 2014 rotary screw trap field season. A report documenting those operations will be completed in the fall of 2014.

Monitor Juvenile Chinook Salmon Production on Battle Creek
Rotary screw traps were operated on Battle Creek during the 2014 rotary screw trap field season. A report documenting those operations will be completed at some future date.

Monitor Juvenile Chinook Salmon Production on the Sacramento River at the Red Bluff Diversion Dam
Rotary screw trap operations on the Sacramento River at the Red Bluff Diversion Dam were conducted during FY 2014. An annual report documenting those results will be developed in 2015.

Sacramento River/San Joaquin River Delta Juvenile Chinook Salmon Delta Survival Study
Juvenile Chinook salmon were tagged with acoustic tags and released to assess their survival through different portions of the Sacramento River/San Joaquin River Delta. The results will be documented in a forthcoming report, and quantify salmon survival in context with the historic drought currently occurring in the state of California.

CAMP Objective #3

Performance Goals and Accomplishments
The storage media used to document various program goals and annual accomplishments was converted from a Microsoft Excel spreadsheet format to an Access database format in 2014. That conversion is expected to markedly improve the ability to track and analyze annual accomplishments across multiple years because the ability to query data from a single media (data source) has been created.

Develop a Science Based Management Framework
Staff from the U.S. Geological Survey finished developing a computerized tool and a framework in 2014 that will be used to: (1) revisit CVPIA Program objectives and performance measures with State and Federal agencies as well as other stakeholders. Reframe the objectives and performance measures where appropriate, with explicitly stated hypotheses with measurable criteria; (2) update/develop a system-wide conceptual/quantitative model for an area that includes the Bay-Delta and Central Valley headwater tributaries to help guide Program decisions; (3) reassess monitoring and evaluation efforts within the context of revised objectives and a system-wide model; and (4) incorporate scientific reviews into the organizational structure of the Program to evaluate the Program's progress.

Anadromous Fish Screen Program 3406 (b)(21)

The Anadromous Fish Screen Program (AFSP) works together with the State of California to construct, replace and rehabilitate fish screens throughout the Central Valley and Sacramento-San Joaquin Delta. The AFSP strives to improve the effectiveness and efficiency of fish screens, and collaborates with other agencies to encourage the dissemination of fish screen related information. The program also seeks to reduce the overall cost of fish screens. These efforts support the CVPIA fish doubling goal by protecting juvenile Chinook salmon, steelhead, and green sturgeon from entrainment at priority water diversions.

The AFSP can provide matching cost share funds for state and local funding, providing up to 50% of the cost of a fish screen project. The AFSP conducts monitoring at many diversions and fish screens to determine the critical factors related to fish losses, and to assure the effectiveness of constructed fish screens. Fish screen projects are often complex and are sometimes constructed in phases over several years. The three key project phases include feasibility, design, and construction. Once a screen is constructed, the diverter is solely responsible for its ongoing operation and maintenance.

Performance Measures

The AFSP's key performance measure is to assist the State of California in developing and implementing measures to avoid juvenile anadromous fish losses resulting from unscreened or inadequately screened diversions. This is accomplished primarily by installation of fish screens. Progress is measured in the number of fish screens constructed, with a target of screening the priority unscreened diversions on prescribed watersheds. The AFSP and the State of California have conducted fish entrainment monitoring at representative unscreened diversions on the Sacramento River to evaluate potential fish screening benefits and to help determine the highest priority diversions for screening.

FY 2014 Accomplishments

The AFSP obligated funding from the Restoration Fund in the amount of $2,346,000, along with $768,000 from Bay-Delta funds and $3,175,000 from Water and Related funds.

Screening Diversions

Construction was completed on the Yuba City Fish Screen for a 74 cfs diversion on the Feather River. This screen consisted of an inclined flat-plate fish screen with an air-burst cleaning system. In addition, fish screens were installed for the north (78 cfs) and south (40 cfs) Feather Water District diversions on the Feather River. These screens are located near the west bank of the river and are cleaned using an external rotating brush. All three of the completed screens on the Feather River provide protection for out-migrating Chinook salmon, steelhead and green sturgeon as well as resident fish.

Fish screen construction was initiated for the Natomas Mutual Water Company's Pritchard Lake Diversion (150 cfs) and Reclamation District 2035/Woodland Davis Clean Water Agency Joint Intake (400 cfs) on the Sacramento River. These fish screens are targeted for completion in 2015 and 2016, respectively. In addition, the AFSP continued to support design, environmental compliance and permitting activities for the following fish screen projects: Colusa Indian Community Council Compton Diversion (22 cfs) on the Sacramento River; South Sutter Water District Pleasant Grove Canal diversion (80 cfs) on Auburn Ravine, and the West Stanislaus Irrigation District Joint Use Intake (375 cfs) on the lower San Joaquin River.

See Table 8 for fish screen projects constructed, by watershed, using AFSP cost share funding.

Table 8: AFSP Projects by Watershed and Cubic Feet per Second (cfs) Screened, 1994-2014

Watershed	Number of Fish Screens	Flow (cfs)
Sacramento	26	4,783
American	1	310
Feather	3	192
Yuba	1	65
Butte	4	257
Delta	7	137
San Joaquin	2	455
TOTAL	**44**	**6,199**

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CHAPTER 3 - WATER MANAGEMENT

Purposes of the CVPIA included improving the operational flexibility of the CVP and increasing the water-related benefits provided by the CVP through voluntary water transfers and improved water conservation as well as providing for fish and wildlife. Section 3404(c) of the Central Valley Project Improvement Act (CVPIA or Act) authorized and directed the Secretary to renew repayment and water service contracts for the delivery of water from the Central Valley Project (CVP). Prior to the passage of the CVPIA, the ability for Central Valley Project (CVP) water contractors to transfer water supplies depended upon their individual authorizations and contracts. Section 3405 of the Act authorized transfers for all water service, water repayment, and settlement contracts, at the time of the passage of the Act, to both CVP and non-CVP customers and established criteria for water transfers. Specific provisions within Section 3406(b) provide for water releases and management to support fisheries and the acquisition of additional water.

Contract Renewals 3404 (c)

All interim and long-term contracts have been renewed. These include 100 long term renewal contracts and 28 interim-renewal contracts have been executed within the various divisions of the CVP. 132 long term contracts have been renewed with the Sacramento River Water Right Settlement contractors and 1 is pending renewal upon expiration in July 2020. Long term execution of the interim-renewal contracts and the remaining unexpired contracts is pending completion of final biological opinions required to support operation of the CVP. Reclamation will continue to implement interim contract renewal consistent with CVPIA until such time that all environmental requirements have been satisfied, including the completion of a new biological opinion on the overall operations of the CVP, upon which time, Reclamation intends to complete long term contract renewal.

Water Transfers 3405

Water transfers are a means by which water supplies under contract can be reallocated from one user to another on a short term or long term basis, to assist in meeting existing and future water needs within California. Water transfers create flexibility in the place and timing of water deliveries that sustain agriculture, municipal and industrial health and safety and provide environmental and recreational benefits. Section 3405 authorizes individuals and districts who held a contract at the time of the Act to transfer all or a portion of that water to other users within the state for any purpose recognized as beneficial under state law, subject to certain terms and conditions.

The CVPIA adopted the transfer criteria under section 1725 of the California water code including requirements for historic use, section 3405(a)(1)(A) and a reduction in consumptive use, section 3405(a)(1)(I). Additionally, section 3405(a)(1)(M) determined that transfers between CVP contractors within a basin shall be deemed to meet historic and consumptive use provisions. Section 3405(a)(1)(M) provides the basis for the Accelerated Water Transfer Program (AWTP).

Reclamation approved a total of 23,000 acre-feet of CVP water in fiscal year 2014. Table 9 shows historical transfers from 2012 through fiscal year 2014.

Table 9. Water Transfers under the CVPIA between 2012 and Fiscal Year 2014 (acre-feet)

Year	Sacramento Basin AWTP	Delta-Mendota Canal AWTP	Friant Division AWTP	North of Delta to South of Delta	South of Delta Non-AWTP	Refuges
2012	64,866	121,239	71,311	0	25,000	38,480
2013	95,716	68,822	108,037	0	92,171	26,756
2014	22,292	6,871	11,721	83,037	106,545	0

Dedicated 800,000 acre-feet Project Yield 3406 (b)(2)

CVPIA authorizes a portion of the CVP project yield to be dedicated and managed for the benefit of fish and other wildlife. Interior has the responsibility to annually dedicate and manage up to 800,000 AF of CVP (b)(2) water for fish, wildlife and habitat restoration purposes. This water includes both CVP releases and decreased CVP export pumping, relative to a hypothetical pre-CVPIA baseline operation. This accounting is applied specifically to changes in operations on the American River (Nimbus Dam), Sacramento River (Keswick Dam), Stanislaus River (Goodwin Dam), Clear Creek (Whiskeytown Dam) and the Delta pumps. The management of (b)(2) water is partially informed by the Anadromous Fish Restoration Plan (AFRP) developed per Section (b)(1), and the results of Instream Flow Incremental Methodology (IFIM) studies, undertaken as part of Section (b)(1)(B), which identify optimal flow, temperature needs, and timing for the life stages of anadromous fish.

The Dedicated Yield Program (DYP) actions affecting fish fall into the following categories:

- Instream flow augmentations on CVP-controlled streams intended to protect salmon and steelhead, as well as contribute toward meeting Anadromous Fish Restoration Program (AFRP) Final Restoration Plan flow objectives
- Increased releases from Goodwin Reservoir to help meet the Water Quality Control Plan (WQCP) requirements for San Joaquin River flows at Vernalis for fish and wildlife standards
- Increased releases from Keswick and/or Nimbus reservoirs to help meet the WQCP fish and wildlife standards
- Export reductions at the CVP Jones pumps to protect at-risk fish species, notably salmon, steelhead and delta smelt, and to help meet the WQCP Delta standards

Performance Measures

Annual contribution – Reclamation annually contributes up to 800,000 AF of water from CVP facilities. In dry years, the target is reduced by up to 100,000 AF. In critically dry years, the target is reduced by up to 200,000 AF.

Contribution to fisheries habitat goal – The 800,000 AF of water contributes towards the 1,000,000 AF fishery habitat goal. The Section (b)(3) Instream Water Acquisition Program contributes the balance, up to 200,000 AF, towards this goal, as described in the CVPIA record of decision (ROD).

FY 2014 Accomplishments

The program obligated $493,000 from the Restoration Fund in FY 2014.

The Water Year (WY) type is a designation that is based on hydrologic indices for the Sacramento and San Joaquin Valleys. Water Year type is either Wet, Above Normal, Below Normal, Dry or Critical. Water year type is largely determined by precipitation and is therefore indicative of local and regional conditions that influence climate, snowpack and runoff.

WY 2014 has been one of the driest in decades and follows two consecutive dry years throughout the state.

This three year period has set a new record for low statewide precipitation accumulation totals in the historical record, which has manifested in very low reservoir levels and dry soil.

The final WY 2014 classification was Critical for both the Sacramento Valley and the San Joaquin Valley.

Consistent with Section 3406(b)(2) of the CVPIA and Interior's May 2003 (b)(2) Policy, the total (b)(2) water allocation was 600 thousand acre feet (TAF) during the 2014 water year. However, due to these historically dry hydrological conditions, Interior was only able to make approximately 400,000 AF of the 600,000 AF of CVPIA (b)(2) water available. The specific uses and locations are shown in Table 11.

This program activity partially funds real-time fish monitoring which informs when and where fish actions should be taken. On a weekly basis, fishery biologists from the Sacramento, San Joaquin and Delta regions report on fish movements to a B2 Interagency Team (Team). The Team, including fishery biologists from FWS, USBR, NOAA, CDFW, and DWR, evaluate the data and collaboratively decide where to apply CVPIA (b)(2) water. Interior provides detailed accounting of (b)(2) fish actions at *http://www.usbr.gov/mp/cvo*.

Table 10: Allocation Target and Use of (b)(2) Water, 2001-2014

Year	Water Year Type*	*Allocation of (b)(2) Water* — (b)(2) Allocation Target (acre-feet)	*Use of (b)(2) Water* — Allocated Flow** (acre-feet)	*Use of (b)(2) Water* — Unused** (acre-feet)	*Use of (b)(2) Water* — Banked (acre-feet)
2001	Dry	800,000	798,000		
2002	Dry	800,000	793,000		
2003	Above Normal	800,000	796,000		
2004	Below Normal	800,000	800,000		
2005	Above Normal	800,000	672,000		128,000
2006	Wet	800,000	422,000	183,000	195,000
2007	Dry	800,000	798,000		
2008	Critical	600,000	600,000		
2009	Dry	600,000	600,000		
2010	Below Normal	800,000	800,000		
2011	Wet	800,000	348,800	451,200	
2012	Below Normal	800,000	800,000		
2013	Dry	700,000	700,000		
2014***	Critical	600,000	600,000		

* Water Year Type is based on the Sacramento Valley Index.
** Section 3406 (b)(2)(D): If the quantity of water dedicated under this paragraph, or any portion thereof, is not needed for the purposes of this section, based on a finding by the Secretary, the Secretary is authorized to make such water available for other project purposes.
*** 2014 water data is estimated.

Table 11: FY 2014 Use of (b)(2) Water by Location

River	Action	Timeframe	Results
American	(b)(2) water used to provide spring outmigration pulse flows	Mar – Apr 2014	Contributed toward AFRP Final Restoration Plan flow objectives and provided pulse flows for juvenile steelhead and fall-run Chinook rearing and outmigration.
Clear Creek	(b)(1) and (b)(2) water used to augment would-be base flows throughout water year 2013	Nov 2013 – Apr 2014	Contributed to AFRP Final Restoration Plan flow objectives and improved instream conditions for fall-run Chinook, spring-run Chinook and steelhead during spawning, incubation, rearing and downstream migration.
	(b)(2) water was used to provide short pulse flows	Apr and Jun 2014	Contributed to AFRP Final Restoration Plan flow objectives and provided pulse flow to attract adult spring-run Chinook salmon to suitable spawning areas.
Sacramento	None	N/A	N/A
Stanislaus	(b)(2) water used to provide a fall attraction pulse flow, two winter instability pulse flows, and spring outmigration pulse flow	Oct – Nov 2013 Jan – Feb 2014 Apr - May 2014	Contributed toward AFRP Final Restoration Plan flow objectives and provided pulse flows for adult fall-run Chinook and steelhead attraction, juvenile steelhead and fall-run Chinook rearing and outmigration, and steelhead juvenile rearing.
CVP Jones Pumping Plant	(b)(2) water used to reduce CVP exports pursuant to both the NMFS BO and the SWRCB WQCP	Nov - Dec 2013 Feb – Apr 2014	Benefitted outmigrating salmon and steelhead smolts and pre-spawning adult delta smelt within the lower Sacramento and San Joaquin Rivers and Sacramento-San Joaquin Delta.

Water Acquisition Program – Instream Water 3406 (b)(3)

The Water Acquisition Program – Instream Water (WAP-Instream) acquires water to supplement the 800,000 acre-feet (AF) of CVP yield that is dedicated to fisheries. The increased instream flows benefit numerous resident and anadromous fish species, but primarily benefit Central Valley Chinook salmon, the majority of salmon produced in California.

Water acquisition for CVPIA-designated refuges and wildlife management areas is discussed in Section 3406 (d)(2), Refuge Water Supply Program (RWSP).

Performance Measure

Acquire up to 200,000 AF per year to supplement the 800,000 AF dedicated from CVP yield to meet the fisheries flow objective of 1,000,000 AF (per ROD, CVPIA Final PEIS, Jan 2001).

FY 2014 Accomplishments

In FY 2014, $215,000 was obligated for the purpose of administering the program. Prior year funds from Water and Related were deobligated. Due to the severe drought no water was acquired this year.

Central Valley rivers and streams were defined in the January 9, 2001, Final Restoration Plan (FRP) for the AFRP as all rivers, streams, creeks, sloughs and other watercourses, regardless of volume and frequency of flow, that drain into the Sacramento River basin, the San Joaquin River basin downstream of Mendota Pool, or the Sacramento-San Joaquin Delta upstream of Chipps Island. The 22 rivers and streams are specifically called out within Appendix B of the FRP and are listed in Appendix B of this report.

The anadromous fish production targets pertain to Chinook salmon, steelhead, striped bass, American shad, white sturgeon, and green sturgeon, which are believed to have been affected by CVP construction and operation.

Table 12. Annual (b)(3) Instream Water Acquisitions, Toward 200,000 Acre-Feet Target, 1994-2014

Year	AF Acquired	% of 200,000 AF Target
1994	76,441	38
1995	0	0
1996	16,161	8
1997	155,983	78
1998	80,000	40
1999	224,498	112
2000	108,880	54
2001	109,785	55
2002	68,105	34
2003	91,526	46
2004	98,211	49
2005	38,500	19
2006	38,500	19
2007	114,645	57
2008	106,490	53
2009	38,500	19
2010	62,480	31
2011	38,500	19
2012	25,714	13
2013	0	0
2014	0	0
Average	**71,091**	**36**

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CHAPTER 4 - REFUGES RESOURCE AREA

Refuge Water Supply Program 3406 (d)(1), (2) & (5)

The Refuge Water Supply Program (RWSP) is comprised of three components:

- **3406 (d)(2) Refuge Water Acquisition** – Acquisition of Incremental Level 4 quantities specified in 3406 (d)(2).
- **3406 (d)(1), (2) & (5) Refuge Water Conveyance** – Delivery of Level 2 water and Incremental Level 4 water in quantities specified in 3406 (d) (1 & 2).
- **3406 (d)(5) Refuge Facilities Construction** – Infrastructure construction to provide conveyance capacity for the delivery of full Level 4 water supplies to the boundary of the CVPIA refuges.

The RWSP was established to implement Section 3406(d), providing for the delivery of water to 19 specific state wildlife areas, federal wildlife refuges and privately owned/managed wetlands (hereinafter referred to as refuges) identified in the Report on Refuge Water Supply Investigations (March 1989) and the San Joaquin Basin Action Plan/Kesterson Mitigation Plan (December 1989). The RWSP's goal is to ensure that all CVPIA refuges annually receive water of specified quantity, of suitable flow rate and timing, and suitable quality to support their wetland and aquatic environments.

Most of the RWSP's activities are based on Reclamation's Mid-Pacific Region's water service contract year (Contract Year), including administration of conveyance and water supply contracts, refuge water allocation delivery schedules, and related accounting of water deliveries. A Contract Year is the period beginning March 1st of each calendar year through the last day of February of the following calendar year. Obligations show Fiscal Year 2014 activities and water delivery data in this report represents Contract Year 2013 (March 1, 2013, thru February 28, 2014) in correlation with water delivery activities, which concluded during the middle of FY 2014. The RWSP components—acquisition, conveyance, and construction—work together to implement the goals of CVPIA related to refuges.

The RWSP's two water targets are defined in CVPIA as Level 2 (L2) water and Level 4 (L4) water.

- L2 is the amount of water required for minimum wetlands and wildlife habitat management based on historic average annual water use before 1989. Reclamation is required to provide full Level 2 water supplies annually. The L2 annual water delivery target is 422,251 acre-feet (AF), including 26,007 acre-feet of "replacement water". Replacement water represents specific quantities of refuge water supplies originally provided by tailwater and groundwater to certain refuges and later replaced with Central Valley Project supplies under pre-CVPIA Reclamation contracts. Replacement water was included in Level 2 water supply allocations in the refuge water supply contracts subsequent to CVPIA.
- L4 is the total annual amount of water identified for each refuge in CVPIA as required for optimum wetlands and wildlife habitat development and management. The L4 water delivery target for the 19 refuges is 555,515 AF.

To achieve the L4 target, however, the RWSP must acquire the incremental difference between the L2 and L4 water supplies, which amounts to 133,264 AF of water. This quantity of water is referred to as Incremental Level 4 (IL4) water and is made available either through direct purchase, exchange, conservation, conjunctive use, lease, donations, or other similar activities. Each year, Reclamation strives to deliver full quantities of L2 supplies based on the schedules of those refuges where sufficient existing conveyance capacity allows. Reclamation also strives to acquire as much as possible of IL4 supplies for delivery to the refuges.

Long-Term Supply Contracts Provide Stability for Refuge Managers

To ensure reliability for refuge managers, Reclamation entered into long-term water supply contracts with the three refuge managing agencies: CDFW, the Service, and Grassland Water District (GWD). These contracts have a performance period of 25 years and are renewable, representing Reclamation's obligation under CVPIA to provide identified quantities of water to these refuges in the Central Valley.

Each year in February and monthly thereafter through May, Reclamation's Central Valley Operations Office announces the water supply allocation available to the CVP contractors and CVPIA refuges (Level 2 water) for the current contract year. Each year between February and March, the RWSP provides the Interagency Refuge Water Management Team (IRWMT) with an initial projection of anticipated Incremental Level 4 water purchases for that contract year. The IRWMT determines the allocation of the projected Incremental Level 4 supplies. The IRWMT is comprised of representatives from Reclamation, the Service, CDFW, GWD, and the Central Valley Joint Venture. The creation of this team was established through a provision in the long-term water supply contracts. Concurrent to this process, the three refuge managing agencies develop their initial annual water delivery schedules for each refuge by March 1.

Use of Groundwater for Refuge Water Supplies

The RWSP strives to broaden its water supply sources. For example, the RWSP pursues groundwater projects in partnership with local water districts. Groundwater is acquired at a lower cost than surface water, and frequently does not require external conveyance if the source can be located at or near a refuge. The lower cost of groundwater is also an advantage, although downsides include groundwater of lesser quality in some locations, particularly in the San Joaquin Valley; threat of aquifer depletion; and land subsidence. The RWSP coordinates with refuge managers for monitoring of groundwater quality for toxins, pollutants and salinity so as not to degrade the general quality of water on the refuges.

During Contract Year 2013, several refuges relied at least in part on groundwater supplies, including Gray Lodge Wildlife Area (WA), Merced and Pixley National Wildlife Refuges (NWR) and Grassland Resource Conservation District (GRCD).

Refuge Benefits

Numerous biological benefits have resulted from a reliable year-round water supply through CVPIA that adequately meets the delivery schedule for wetland management on CVPIA refuges. Habitat is now available during the months of August and early September that benefits early arriving migrant waterfowl and shorebirds; habitat is also provided for resident wildlife and their young during the spring and summer, when wetland habitat can be particularly limited by hydrology. Introducing water for semi-permanent and permanent wetland habitat in the spring and summer directly benefits the recovery of special status species such as the giant garter snake, and tricolored blackbirds.

Wintering wildlife also benefit from this habitat diversity, as seasonal wetlands are now managed to coincide with peak migration times of shorebirds and waterfowl. Timely de-watering and irrigations promote the germination and irrigation of important moist-soil food plants, such as swamp timothy and watergrass. These plants provide a high-energy food source through both their seeds and associated invertebrate communities.

Refuge Water Acquisition 3406 (d)(2)

The Refuge Water Acquisition Component (RWAC) is responsible for the acquisition of IL4 Water for critical wetland habitat supporting resident and migratory waterfowl, threatened and endangered species, and wetland dependent aquatic biota on the refuges.

IL4 water consists of annual purchases from willing sellers from both surface and groundwater supplies. In 1998 and 2005 the RWAC acquired a total of 9,300 AF of permanent IL4 surface water supplies. The RWAC also acquires a portion of water supplies at no cost, including 215 water, and water delivered under a mitigation agreement with the Federal Energy Regulatory Commission.

The RWAC continues to use groundwater to lower costs and increase reliability of providing IL4 refuge water supplies with acquisitions from GWD and by other groundwater wells including two groundwater wells constructed at the Volta Wildlife Area under the American Recovery and Reinvestment Act through a pilot project. The groundwater wells will increase water supply reliability and the ARRA funded wells help to diversify L2 water sources. It is anticipated that together these wells will produce up to 10,000 AF annually.

Performance Measures

Acquisition - The RWAC's goal is to acquire enough water to deliver 133,264 acre-feet (AF) of IL4 water to refuge boundaries annually (i.e. 133,264 AF plus any additional water needed to cover conveyance losses).

FY 2014 Accomplishments

The RWCP obligated $1,084,000 from the Restoration Fund FY 2014. Funds were used primarily for water purchases, ground water assessment, and program administration.

The RWAC entered into contracts with the following contractors to purchase a total amount of 33,925 AF of IL4 water to be delivered in water year 2013: San Joaquin River Exchange Contractors (19,500 A/F), Merced Irrigation District (7,256 A/F), and Grassland Water District (7,169 A/F of groundwater). In addition, permanent surface water of 5,858 AF, mitigation water of 2,500 AF, Volta well water of 1,146 A/F and Pixley well water of 102 A/F were acquired at no additional cost for the water and increased the amount of IL4 to 41,531 AF, which includes water to account for conveyance losses such as seepage and evaporation (see Table 13).

In Contract Year 2013 approximately 42,243 AF of IL4 water was delivered to the refuges. See the next section on Conveyance for more information on water deliveries.

Table 13. Incremental Level 4 Acquisitions by Fiscal Year, 2002-2014

Fiscal Year*	Gross Incremental Level 4 Water Acquired (AF)**
2002	94,690
2003	79,300
2004	77,010
2005	85,538
2006	94,622
2007	51,911
2008	41,108
2009	42,526
2010	74,038
2011	102,565
2012	59,197
2013	50,281
2014	22,579

* A water year is the period beginning March 1st of each calendar year through the last day of February the following calendar year.

** Water acquired is from all sources (purchased and non purchased).

Refuge Water Conveyance 3406 (d) (1), (2) & (5)

The Refuge Water Conveyance (Wheeling) Component (RWCC) is responsible for providing long-term, firm and reliable water deliveries to the 19 CVPIA refuges located in the Central Valley of California. The RWCC has two primary performance goals, specifically, starting with Water Year 2002 forward, based on established refuge allocations for each of the two water types:

- Annually provide/deliver Level 2 (L2) water supplies by specified amounts to the refuges totaling 422,251 acre-feet; and
- Annually deliver IL4 acquired water supplies by specified amounts to the refuges totaling 133,264 acre-feet.

The RWCC delivers L2 and IL4 water supplies to the refuges through agreements with water conveying entities.

Reclamation entered into five long-term water supply contracts with GWD (1), the Service (2), and CDFW (2) which established Reclamation's commitment to the CVPIA delivery mandates.

Reclamation currently has eight long-term (15-50 years) conveyance agreements that are administered by the RWCC, along with one Service 40-year conveyance agreement, also administered under the RWCC. The RWCC utilizes cooperative agreements to reimburse delivering entities for costs of conveying L2 and IL4 water supplies through federal, state, and private water distribution systems to the refuges. The RWCC also uses agreements to reimburse costs for groundwater pumping.

Performance Measures

The RWCC goal is to deliver L2 water supplies of 422,251 acre-feet (AF) per year; and IL4 water of 133,264 AF per year to the boundary of the refuges.

A portion of L2 water supplies is provided from non-CVP diverse sources, which assists in minimizing possible adverse effects on other CVP contractors.

FY 2014 Accomplishments

The RWCC obligated $9,973,000 from the Restoration Fund.

In Contract Year 2013, an estimated 387,611 AF of L2 water was delivered to the refuges, representing 92% of the target (Table 18).

Approximately 42,243 AF of IL4 water was delivered, representing 32% of the target. Table 15 shows the targets and deliveries for each refuge in Contract Year 2013.

Of the estimated total of 270,915 AF of L2 water delivered in Contract Year 2013, a total of approximately 57,030 AF was delivered from diverse sources (i.e. non-CVP sources), including riparian water rights water, pre-1914 water rights water, groundwater, and water provided under Merced Irrigation District's existing mitigation agreement with the Federal Energy Regulatory Commission.

Table 14. Level 2 (L2), Incremental Level 4 (IL4) and Level 4 (L4) Water Deliveries by Water Service Contract Years 2002-2014

Water Service Contract Year*	L2 Delivered	% 422,251 AF L2 Goal**	IL4 Delivered	% 133,262 AF Inc L4 Goal***	Total Delivered	% 555,515 AF L4 Goal
2002	383,842	91%	82,262	62%	466,104	84%
2003	391,636	93%	78,657	59%	470,293	85%
2004	385,732	91%	68,262	51%	453,994	82%
2005	388,803	92%	83,211	62%	472,014	85%
2006	380,073	90%	90,545	68%	470,618	85%
2007	388,521	92%	45,049	34%	433,570	78%
2008	398,010	94%	37,066	28%	435,076	78%
2009	383,739	91%	41,313	31%	425,052	77%
2010	378,086	90%	71,743	54%	449,829	81%
2011	380,688	90%	99,612	75%	480,300	86%
2012	382,628	91%	50,782	38%	433,410	78%
2013	387,611	92%	42,243	32%	429,854	77%
2014	249,987	59%	16,020	12%	266,007	48%

* Water Service Contract Year (WY) is the period from and including March 1 of each calendar year through the last day of February of the following calendar year.
** This includes approximately 26,000 AF of replacement water.
*** Does not include replacement water

Table 15. Water Targets and Deliveries for Each Refuge (Contract Year 2013)

	Water Allocation Targets			WY 2013 Deliveries			% Target Achieved	
Refuge Name & Region	Level 2 Water (AF)*	IL4 Water (AF)**	Full Level 4 Water (AF) (= L2+IL4)	Level 2 Water (AF)	IL4 Water (AF)	Total Delivered (AF) (= L2+IL4)	Level 2 Water (%)	IL4 Water (%)
Grassland Water District (private) — San Joaquin Valley								
Grassland RCD	125,000	55,000	180,000	128,233	25,010	153,243	103%	45%
CA Department of Fish and Wildlife — Sacramento Valley								
Gray Lodge WA	35,400	8,600	44,000	29,889	0	29,889	84%	0%
CA Department of Fish and Wildlife — San Joaquin Valley								
Volta WA	13,000	3,000	16,000	9,064	0	9,064	70%	0%
Los Banos WA	16,670	8,330	25,000	17,155	2,489	19,644	103%	30%
Salt Slough Unit	6,680	3,340	10,020	6,336	2,150	8,486	95%	64%
China Island Unit	6,967	3,483	10,450	4,932	1,875	6,807	71%	54%
Mendota WA	27,594	2,056	29,650	28,508	0	28,508	103%	0%
U.S. Fish and Wildlife Service — Sacramento Valley								
Sacramento NWR	46,400	3,600	50,000	40,498	0	40,498	87%	0%
Delevan NWR	20,950	9,050	30,000	21,377	2,550	23,927	102%	28%
Colusa NWR	25,000	0	25,000	17,421	0	17,421	70%	N/A
Sutter NWR	23,500	6,500	30,000	13,570	0	13,570	58%	0%
U.S. Fish and Wildlife Service — San Joaquin Valley								
San Luis Unit	19,000	0	19,000	18,824	0	18,824	99%	N/A
Kesterson Unit	10,000	0	10,000	10,991	0	10,991	110%	N/A
West Bear Creek Unit	7,207	3,603	10,810	7,207	0	7,207	100%	0%
Freitas Unit	5,290	0	5,290	4,982	0	4,982	94%	N/A
Merced NWR	13,500	2,500	16,000	13,492	2,500	15,992	100%	100%
East Bear Creek Unit	8,863	4,432	13,295	3,902	0	3,902	44%	0%
U.S. Fish and Wildlife Service — Tulare Lake Basin								
Kern NWR	9,950	15,050	25,000	9,950	5,567	15,517	100%	37%
Pixley NWR	1,280	4,720	6,000	1,280	102	1,382	100%	2%
TOTAL	**422,251**	**133,264**	**555,515**	**387,611**	**42,243**	**429,854**	**92%**	**32%**

* This includes approximately 26,000 AF of replacement water.
* * Does not include replacement water

Refuge Facilities Construction Component 3406 (d)(5)

The Refuges Facilities Construction Component (RFCC) provides the necessary infrastructure with sufficient conveyance capacity to support long-term delivery of firm, reliable water supplies to the boundary of the CVPIA refuges, as identified in the Act. The RFCC is responsible for the delivery of water to those lands identified in the Report on Refuge Water Supply Investigations (March 1989) (Report) and the San Joaquin Basin Action Plan/Kesterson Mitigation Action Plan (December 1989)(Plan).

The need to upgrade conveyance facilities is a result of capacity constraints in existing delivery systems and/or the lack of existing systems. The goal of the RFCC is to have the necessary facilities in place for delivery of L4 water supplies to the CVPIA refuges, meeting their timing and scheduling requirements. A L4 water supply will support optimum wildlife habitat over a broad range of species including targeted Threatened and Endangered species.

The RFCC identified a total of 46 major structures and/or actions (Projects) necessary to provide needed capacity for the delivery of FL4 surface supplies to these refuges. These infrastructure improvements can be divided into two categories:

- **Modify existing facilities** – Existing conveyance facilities can be upgraded to overcome capacity constraints, and
- **Construct new facilities** – New facilities are constructed where there is no existing system, or where modifications to an existing system would not be sufficient to meet demand.

Twenty of the Projects are located on refuge lands identified in the Plan and 26 Projects are associated with refuges identified in the Report. Those refuges still requiring conveyance facility improvements are: Gray Lodge and Mendota WAs, and Sutter and Pixley NWRs.

An Implementation Plan for refuges identified in the Plan was completed in April 1998, and cooperative agreements with the San Luis Canal Company, GWD, and Central California Irrigation District to convey water to these refuges were completed in summer 1998. Reclamation is currently administering the cooperative agreements, which include construction and rehabilitation of facilities to accommodate the needs of these refuges.

RFCC activities include project integration and coordination with the associated Refuge Water Conveyance Component (RWCC) and Refuge Water Acquisition Component (RWAC) to ensure continuity of methodologies and approaches towards executing and achieving RFCC objectives. Interagency coordination activities are included in this element as well as budget formulation, tracking, and management activities. Additional activities are coordinating planning, design, and construction efforts between agencies and water purveyors (water districts). Reclamation's Mid-Pacific Construction Office (MPCO) provides assistance to the RFCC by administering design and construction contracts/agreements including construction contract award, facilities construction activities, construction inspection and management, and coordination as appropriate with other agencies regarding permit requirements.

Performance Measures

The goal of the RFCC is to ensure that all 19 CVPIA refuges have the external conveyance capacity to receive L4 Water, totaling 555,515 acre-feet (AF), on an annual basis.

FY 2014 Accomplishments

In FY 2014, the RFCC obligated $4,469,000 from the Restoration Fund in support of refuges identified in the Plan.

In FY 2014, the RFCC extended the period of performance period on the contract for services to provide ongoing repairs to the East Bear Pumping Plant located at the East Bear Creek Unit of the San Luis National Wildlife Refuge. In addition, the RFCC initiated a solicitation to repair Pump #2 at the pumping facility. A contract for this repair was awarded and obligated in FY 2014.

In FY 2014, the RFCC solicited for the repair of erosion problems encountered at the Pixley NWR's groundwater wells. Prior repair work on the alfalfa valves was not effective. A contract for this repair was awarded and obligated in FY 2014.

In FY 2014, a contract for a feasibility study was executed for the Sutter NWR. The study is to assess both an interim solution and identify a long-term comprehensive solution for a permanent reliable water supply conveyance system. The study is expected to be completed in early FY 2015.

In FY 2014, the RFCC solicited to complete data assessment and for the three-year demonstration project as part of the Volta Wildlife Area Level 2 Diversification/Incremental Level 4 Development Pilot Project Monitoring Plan. A contract for this project was awarded and obligated in FY 2014.

In FY 2014, the RFCC began construction on the Biggs-West Gridley Water District (BWGWD) Facilities Improvement Project. Construction is expected to be completed in FY 2019. When completed, BWGWD will have sufficient conveyance capacity for L4 water deliveries to the Gray Lodge WA.

For each of the 19 CVPIA refuges, the conveyance target and actual conveyance capacity are shown in Table 16.

Table 16. Target FL4 Conveyance Capacity vs. Actual by Refuge

Refuge Name - Region	Target FL4 Capacity (in acre-feet)	Actual Conveyance Capacity (in acre-feet)	% of Target	Expected Date for Completed Conveyance Construction
Grassland Water District (private) – San Joaquin Valley				
Grassland Resource Conservation District	180,000	180,000	100	
CA Department of Fish and Wildlife – Sacramento Valley				
Gray Lodge Wildlife Area	44,000	18,000	41	2019
CA Department of Fish and Wildlife – San Joaquin Valley				
Volta Wildlife Area	16,000	16,000	100	
Los Banos Wildlife Area	25,000	25,000	100	
Salt Slough Unit	10,020	10,020	100	
China Island Unit	10,450	10,450	100	
Mendota Wildlife Area	29,650	26,000	91	2030
U.S. Fish and Wildlife Service – Sacramento Valley				
Sacramento National Wildlife Refuge	50,000	50,000	100	
Delevan National Wildlife Refuge	30,000	30,000	100	
Colusa National Wildlife Refuge	25,000	25,000	100	
Sutter National Wildlife Refuge - Lift Station	30,000	0	0	2018
U.S. Fish and Wildlife Service – San Joaquin Valley				
San Luis Unit	19,000	19,000	100	
Kesterson Unit	10,000	10,000	100	
West Bear Creek Unit	10,810	10,810	100	
Freitas Unit	5,290	5,290	100	
Merced National Wildlife Refuge	16,000	16,000	100	
East Bear Creek Unit	13,295	13,295	100	
U.S. Fish and Wildlife Service – Tulare Lake Basin				
Kern National Wildlife Refuge	25,000	25,000	100	
Pixley National Wildlife Refuge	6,000	1,280	21	2020

CHAPTER 5 - INDEPENDENT PROGRAMS

Bay-Delta Activities 3406 (b)(1)

Reclamation's Bay-Delta Office (BDO) coordinates with the CVPIA office to respond to the urgent needs of species in the Bay-Delta. As such, projects typically include those which address CVP operations and the Reasonable and Prudent Alternatives (RPA) prescribed by the regulating agencies.

FY 2014 Accomplishments

The BDO obligated $3,474,000 from the Bay-Delta Fund in FY14.

BDO carried out several projects to benefit fish through the CVPIA. A network of about 30 tidal flow and continuous water quality monitoring stations were maintained throughout the Delta to measure fish habitat quality, to inform hydrodynamic and sediment modeling efforts, and to provide CVP/SWP operators with an early warning system for the arrival of turbidity plumes containing delta smelt. These data are posted in near-real time on the US Geological Survey NWIS web site. The BDO program also funded the fourth and final year of the 'first flush' study. This study documents the response of delta smelt to tidal flow and turbidity during the first high flow event of the winter. Some of the results of this study have been published in a peer-reviewed journal article.

The BDO also continued funding for the six-year study of juvenile steelhead survival in the south Delta (required under the NMFS Biological Opinion).

Habitat Restoration Program for Other Adverse Environmental Impacts of the CVP Under 3406 (b)(1)

The Habitat Restoration Program (HRP) benefits federally listed Central Valley species and habitats impacted by construction and operation of the CVP. Habitat loss and fragmentation occurred across a large part of the Central Valley as a result of CVP construction and operation, and the program is charged with contributing to the habitat mitigation requirements for this loss.

The HRP's priorities include purchase of fee title or conservation easements on lands where threats to listed species are significant. The program also focuses on restoration of CVP-affected habitats, and research to facilitate species recovery. In addition, the HRP supports captive propagation and reintroduction of federally listed species affected by the CVP.

Performance Measures

Since fiscal year 1996, the HRP has provided significant contributions by funding 121 diverse and valuable projects to benefit a multitude of federally listed and other special status species that were impacted by the CVP. Federally listed species which have benefitted include the San Joaquin kit fox, giant kangaroo rat, riparian brush rabbit, blunt-nosed leopard lizard, giant garter snake, bay checkerspot butterfly, Lange's metalmark butterfly, vernal pool plant and invertebrate species, and gabbro and serpentine soils species. The HRP provides leveraging of funds by attracting additional funding partners which decreases the amount of HRP funds needed to implement a project; partners have contributed about 85 percent of total project costs. Land acquisition projects currently have the highest priority and receive at least 50 percent of the available funding.

Protection and Restoration

The program contributes to the protection and restoration of threatened and endangered species habitats affected by the construction and operation of the CVP. Protection includes acquisition of lands through fee title or conservation easements. Since 1996, over 109,000 acres have been acquired and over 6,000 acres have been restored with HRP funds along with funds from partners (see Table 18). Various habitat types throughout the Central Valley have benefitted including alkali sink/scrub, valley grassland, riparian, vernal pools and other wetlands, serpentine soils, and chaparral.

The 1999 State Water Resources Control Board Decision 1641 (SWRCB's D-1641) requires that Reclamation provide compensation and habitat values to mitigate for impacts associated with the delivery of CVP water to lands previously outside the CVP Consolidated Place of Use. It identifies the HRP as one of three Reclamation programs suitable for fulfilling the mitigation plan. Pursuant to the SWRCB's D-1641, Reclamation developed the Consolidated Place of Use, Habitat Mitigation Plan and Monitoring and Reporting Program (HMP) as a report/strategy of how the mitigation requirements will be addressed. The HMP identifies acquisition, maintenance, and restoration of 45,391 acres needing to occur as mitigation related to the CVP Consolidated Place of Use. To date, the program has protected and restored 7,600 acres of habitat within the CVP Consolidated Place of Use.

Research and Captive Propagation and Reintroduction

The program also supports the recovery of threatened and endangered species through stabilization and improvement of species populations by funding research and captive propagation and reintroduction activities. In part, research projects ultimately contribute important information towards increasing current and future protection and/or restoration of species or habitats impacted by the CVP. Research has included vernal pool mapping, assessing the potential for listed species reintroductions, and numerous genetics analyses. Captive propagation and reintroduction have benefitted two critically endangered species as well as other federally listed species.

FY 2014 Accomplishments

In 2014, $1,523,000 was allocated to the program from the Restoration Fund to achieve the following:

- **Protection**. HRP funding helped protect 795 acres of land through fee title acquisition in Fresno County. (See Table 17 for 2014 project accomplishments, and Table 18 for approximate acres protected and restored from 1996 through 2014 using HRP funds as well as partners' funds). All 795 of these acres count towards the SWRCB's D-1641 requirements.

Table 17: Projects Funded by the (b)(1) “Other” Program in 2014

Name of Project	Activity Description	Latitude and Longitude
Eastern Ciervo-Panoche Natural Area Habitat Protection Project (Mouren Cattle Company property)	Fee title acquisition of 2 parcels located on the eastern slope of the Ciervo Hills to protect San Joaquin kit fox, giant kangaroo rat, blunt-nosed leopard lizard, and San Joaquin woolly-threads in western Fresno County.	Parcel 1: Lat: 36°29’41.01”N; Long: 120°33’36.27”W Parcel 2: Lat: 36°33’49.37”N Long: 120°33’36.13”W

Table 18: Approximate Acres of Habitat Protected and Restored by the (b)(1) “Other” Program, 1996-2014, Using HRP Funds

Year	Acreage Protected	Acreage Restored	Cumulative Acreage of Protection and Restoration
1996	3,018	0	3,018
1997	284	617	3,919
1998	74,146	0	78,065
1999	1,180	0	79,245
2000	1,426	206	80,877
2001	2,831	0	83,708
2002	2,211	0	85,919
2003	2,866	0	88,785
2004	719	432	89,936
2005	755	3,370	94,061
2006	193	731	94,985
2007	1,603	122	96,710
2008	0	700	97,410
2009	5,165	0	102,575
2010	3,404	48	106,027
2011	5,384	129	111,540
2012	2,310	0	113,850
2013	1,873	0	115,723
2014	3,042	0	118,765
Total	**112,410**	**6,355**	**118,765**

Trinity River Restoration Program 3406 (b)(1) “Other” & (b)(23)

The Trinity River Restoration Program (TRRP) is dedicated to the improvement of anadromous fishery resources in the Trinity River Basin. The program uses two authorities: CVPIA section 3406 (b)(1) “other” for river restoration and CVPIA section 3406 (b)(23) for delivering flows.

The Trinity River Mainstem Fishery Restoration Final Environmental Impact Statement (FEIS) completed in October 2000, and the Record of Decision (ROD), signed on December 19, 2000, established a comprehensive science-based adaptive management program to restore the fishery resources of the Trinity River. The 2009 Master Environmental Impact Report (Master EIR) on channel rehabilitation and sediment management for remaining sites established the regulatory requirements for implementing physical river work required by the ROD.

The program is based upon the goal of restoring the naturally produced anadromous fishery resources of the Trinity River by restoring the attributes of a healthy, alluvial river system through implementing variable annual instream flows, physical channel rehabilitation, sediment management, watershed and riparian rehabilitation and floodplain infrastructure improvements. Together, these actions will increase and enhance habitats for all life stages of anadromous salmonids, increase juvenile production and lead to increased spawning escapement and harvest opportunities of dependent fisheries. Since the ROD was signed, the TRRP has focused its physical restoration activities—such as gravel placement and channel rehabilitation activities—on the upper 40 miles of the Trinity River between Lewiston Dam and the confluence with the North Fork of the Trinity River as well as flow releases and sediment transportation that benefit the entire riverine system.

Performance Measures

The overall success of the program is gauged by naturally produced spawner escapement numbers relative to the goal (target) set for each species, and contributions to dependent tribal and non-tribal fisheries. Annual targets are found in Table 19. To achieve this overall goal, the program implements actions in several key areas that support the establishment of a healthy riverine system. Actions include scheduling annual flow of water, placement of coarse sediment, reduction of fine sediment delivery from watersheds by implementing watershed rehabilitation activities and physical channel restoration projects.

Flows

The program releases between 369,000 and 815,000 AF each year, in accordance with the ROD. The annual volume target and peak flow varies according to the water year type.

Placement of Coarse Sediment

The program may place up to 10,000 tons (7000 CY) of coarse sediment annually.

Fine Sediment Delivery and Storage

The program aims to reduce fine sediment delivery from tributary watersheds by 10,000 to 20,000 CY annually. Additionally, the goal for fine sediment management is to transport as much or more fine sediment downstream as is delivered to the upper river from tributary watersheds to reduce in-channel storage.

Channel Rehabilitation

The goal of the channel rehabilitation component of the program is to restore functioning alluvial river attributes and increase salmonid freshwater habitat. The ROD calls for 44 bank rehabilitation projects and 3 side channels, which combine to make 47 sites. Channel restoration progress is currently measured by the number of completed sites. The final measure of the success of channel rehabilitation projects will be their effectiveness of promoting a dynamic alluvial river in conjunction with high flows and coarse sediment augmentation to increase salmonid habitat and restore the Trinity River fishery resources. This is being evaluated through the Program’s adaptive management process.

Other

In addition to the action oriented performance measures listed above, the TRRP has developed performance measure documents that provide information pertaining to key metrics that are used to evaluate status and trends of these parameters. These Include: Temperature Target Performance; Chinook and Coho Salmon Rearing Habitat; Abundance of Naturally Produced Juvenile Chinook Salmon; Spawning Escapement of Naturally Produced Salmonids; Proportion of Natural Origin Salmonids Contributing to Total In-River Run; Distribution of Natural-Origin Chinook Salmon Spawners; Abundance Patterns Over Time of Riverine Birds; Abundance Patterns Over Time for Riparian Birds; and Comparison of Turtles on the South Fork Trinity and Mainstem Trinity. All program products can be found on the online data portal: *http://www.odp.trrp.net/*

FY 2014 Accomplishments

In FY 2014, the Trinity River Restoration Program obligated $2,339,000 from the Water & Related

Resources Fund (b)(23), $10,268,000 from the Water & Related Resources Fund (b)(1) "other" and $1,518,000 from CVP Restoration Funds.

Flows

Water Year 2014 was a Critically Dry Water Year. Water temperature, channel rehabilitation construction, juvenile salmonid numbers and available habitat and riparian vegetation issues were considered in flow scheduling. The ROD prescribed flow for a critically dry water year is 369,000 AF. Water volume peak flow at 1500 cfs was released from April 24 through May 30, 2014 with flows decreasing to 450 cfs by June 26, 2014.

Course Gravel and Channel Rehabilitation

A channel rehabilitation project was implemented at Lower Junction City completing one more of 47 sites included in the ROD for a total of 31 sites completed. The program also continued planning and engineering designs for the next four channel rehabilitation projects.

Monitoring and Assessment

Approximately 12 science and monitoring activities were accomplished in FY 2014 to include stream gaging, sediment transport, course and fine sediment budgets, smolt outmigration population size and timing, adult spawning escapement separated by natural and hatchery, sport and tribal harvest, system wide habitat assessment, evaluation of habitat produced through construction, riparian vegetation recruitment and encroachment and system wide bird abundance. Results from salmon production monitoring are below in Table 19. Other results are included in the TRRP performance measures documents mentioned above as well as in reports located on the TRRP Online Data Portal (*http://www.odp.trrp.net/*).

Table 19. Salmonid Production, Natural vs. Hatchery[1]

	Naturally Produced Adult Spawner Escapement[2]				Trinity River Hatchery Produced Adult Spawner Escapement[3]			
	Fall Chinook[4]	Spring Chinook[5]	Fall Steelhead[6]	Coho[7]	Fall Chinook[4]	Spring Chinook[5]	Fall Steelhead[6]	Coho[7]
Target	62,000	6,000	40,000	1,400	9,000	3,000	10,000	2,100
2010	14,715	5,093	3,786	817	13,335	4,314	4,468	5,852
2011	17,158	6,739	6,900	1,205	27,534	5,351	14,044	4,113
2012	35,540	9,613	8,267	1,774	31,238	14,472	11,745	13,494
2013	16,689	3,144	9,119	4,305	12,785	5,835	6,816	14,782
Average	21,025	6,147	7,018	2,025	21,223	7,493	9,268	9,560

[1] All table entries reflect final numbers reported by CDFW.
[2] Estimates of naturally-produced adult salmonid spawner escapement for combined natural and hatchery spawning areas.
[3] Estimates of hatchery-produced adult salmonid spawner escapement for combined natural and hatchery spawning areas.
[4] Fall Chinook estimates upstream of Willow Creek weir. Trinity River Basin estimate assumes no straying of hatchery produced spawner escapement downstream of Willow Creek weir.
[5] Spring Chinook estimates upstream of Junction City weir combined with dive counts for the South Fork Trinity River and miscellaneous tributaries.
[6] Fall-run steelhead estimates upstream of Willow Creek weir for all years of data collected. Does not include summer- or winter run steelhead estimates.
[7] Coho estimates upstream of Willow Creek weir.

Table 20. Annual ROD Flows and Peak Releases to Trinity River, 2006-2014

Fiscal Year	Water Year Type	ROD Flow Target	ROD Flow Provided*	Peak Releases (cfs)
2006	Extremely wet	815,000 AF	809,900 AF	10,100
2007	Dry	453,000 AF	453,700 AF	4,750
2008	Normal	647,000 AF	648,700 AF	6,470
2009	Dry	453,000 AF	445,500 AF	4,410
2010	Normal	647,000 AF	656,700 AF	6,840
2011	Wet	701,000 AF	721,800 AF	11,600
2012	Normal	647,000 AF	647,000 AF	6,080
2013	Dry	453,000 AF	453,000 AF	4,500
2014	Critically Dry	369,000 AF	369,000 AF	1,500

* Computed flow volume ± 5% based on stream flow measurement accuracy.

Table 21. Placement of Coarse Gravel by Year (7,000 Cubic Yard Target), 2003-2014

Fiscal Year	Gravel Augmentation Location	Gravel * (CY)	Total per Year* (CY)
2003	Cableway	2,000	2,000
2006	Hatchery	1,600	1,600
2007	Hatchery	4,300	4,300
2008	High Flow Injections	2,300	12,300
	Lewiston-Dark Gulch	10,000	
2009	High Flow Injections	2,300	8,000
	Sawmill	5,700	
2010	High Flow Injections	3,100	13,500
	Lowden Ranch Area and Reading Creek	10,400	
2011	High Flow Injections	5,300	5,300
2012	Upper Junction City	0	0
	Lower Steiner Flat	0	
2013	High Flow Injections	200	1,700
	Saw Mill Dry Placement	1,500	
2014	Lower Junction City	3,620	3,620
		Total	**52,320**

* Volume for mobile coarse gravel only. Reported volumes do not included oversized gravel or structural gravel to build permanent in-river features.

Table 22. Rehabilitation Site Construction Summary, 2005-2014

Fiscal Year	Rehabilitation Site	Number of Sites	Earth-work (CY)	Feet of Large Wood Habitat Structures	River Miles	Acres Treated
2005	Hocker Flat (complete)	1	83,000	0	1.0	26
2006	Canyon Creek Sites (complete)	4	91,000	100	1.7	40
2007	Indian Creek Sites (complete)	3	77,800	200	2.8	31
2008	Lewiston and Dark Gulch Sites (complete)	8	56,900	200	3.7	42
2009	Sawmill and Steel Bridge Day Use* (complete)	2	87,750	260	0.8	25
2010	Lowden, Trinity House Gulch, Reading Creek	5	202,600	300	2.4	36
2011	Wheel Gulch (complete)	1	48,000	200	0.3	7
2012	Upper Junction City, Lower Steiner Flat	4	63,900	400	1.2	45
2013	Lorenz Gulch and Lower Douglas City	2	56,400	525	1.4	52
2014	Lower Junction City	1	34,580	250	0.5	52
	Total	**31**	**801,930**	**2,435**	**15.8**	**356**

* The No-Action alternative was chosen for the Steel Bridge Day Use Project Site.

Ecosystem and Water Systems Operations Models 3406 (g)

FY 2014 Accomplishments

The Modeling Program obligated $678,000 from the Restoration Fund and $290,000 from the Water and Related Fund in FY14.

CalSim II accomplishments for FY14 include: (1) Analyzing the impact of alternative streamflow standards (including the proposed New Melones Revised Plan of Operations) on Stanislaus River operations using the CalSim SJR model, (2) providing CalSim support for development of models for the Remanded Biological Opinions EIS, (3) reviewing CalSim baseline for the Folsom Water Control Manual Update, which led to some model updates, (4) reviewing software tools for improved visualization of CalSim results and submitted an S&T proposal on this topic, (5) collaborating with BDO to create a draft protocol for CalSim Model Maintenance Management (CM3) process, (6) completion of CalSim II codes to use with new WRIMS2 engine and to develop the study results for the 2013 Delivery Reliability Report, (7) completion of the CalSim II codes to incorporate the D1485, D1641, B2, and BO RPAs and then investigation of the effects of these regulations on water supply and Delta outflow, (8) development of several baseline CalSim II models for the COA negotiations and the COA Agreement re-evaluations, (9) development of a post processing tool to analyze the results for tracking water from CVP and SWP reservoirs to Delta, (10) development of a multi-step runner to run multi-regulation studies, (11) sensitivity of including different B2 actions in the model, and (12) development of more user-friendly automated data processing packages for input/output analysis and display. These developments and modifications facilitate the use of the model for numerous studies by Reclamation and others which ultimately lead to increased understanding referenced in §3406(g).

CalLite accomplishments for FY14 include: (1) reviewing and providing comments to DWR on CalLite Forecast Allocation Module (FAM), (2) using modified version of CalLite to analyze benefits of additional South-of-Delta storage in San Luis and Los Vaqueros, (3) provided support to DWR for testing and QA-QC of final version of CalLite 3.0 (expected release data is late Sept - Oct 2014), (4) implementation of North Delta Diversion option (a.k.a. Isolated Facility), (5) development of a dynamic San Joaquin, (6) addition of an enlarged Shasta Dam option, (7) addition of an enlarged Las Vaqueros option (5) implementation of the Forecast Allocation Model (FAM), (8) the addition of the D-1485 run basis, and of batch run, (9) position analysis script for CalLite, and (10) improved and more flexible CalLite GUI for post processing.

CalSim 3.0 accomplishments for FY14 include: (1) Continued CalSim 3.0 QA/QC and improvement; (2) continued CalSimHydro model improvement; (3) initiated development of CalSimForecast; (4) initiated development of CalSim 3.0 water rights management feature; (5) incorporated expansion of CalSim 3.0 model domain; (6) developed methodology to determine historical change of rice planting date and growing season based on Landsat imagery for CalSimHydro.

C2VSIM (California Central Valley Groundwater-Surface Water Simulation Model) accomplishments for FY14 include: (1) Held public workshops on the C2VSIM model, (2) held workshops on IWFM and IDC models, (3) released IWFM version 4.1 for public use in July 2014, (4) started a project in the application of a modified version of C2VSIM to estimate natural inflows into the Sacramento – San Joaquin Delta (ongoing).

ANN Model accomplishments for FY14 include studying the methodology used by the Metropolitan Water District (MWD) to predict turbidity in Delta channels.

DSM2 model accomplishments for FY14 include: (1) partial development of a new water Quality module for DSM2, (2) continued development of better Delta consumptive use estimates, (3) Delta drought real time support, (4) Improvement of visualization tools for Drought analysis, (5) continuation of adding fish behaviors to the PTM module of DSM2, (6) new calibration techniques using PEST (Model-Independent Parameter Estimation and Uncertainty Analysis) (7) partial completion of the replacement the DSM2 cross section development program using GIS tools.

In FY14, the HydroGeoSphere San Joaquin Valley Model (HGSSJVM) was calibrated and presented to staff of the Tracy and Fresno offices. HGSSJVM is a groundwater model that can be used to simulate the land subsidence resulting from groundwater pumping. The model has been developed for analyzing possibility of incurring irreversible subsidence due to specific groundwater pumping plans such as the Warren Act pumping, as well as performing a more comprehensive sensitivity analysis of the relationship between pumping and subsidence.

The 3406 (g) program also prepared publications and provided support to model applications for stakeholders.

All of the projects that were undertaken in FY2014 met or exceeded the performance targets.

Land Retirement Program 3408 (h)

The Land Retirement Program (LRP) purchases land, water and other property interests from willing sellers who receive CVP water. By ceasing irrigation of these drainage impaired agricultural lands, the program reduces the volume of agricultural drainage produced, and provides the opportunity to protect and restore the retired land for wildlife habitat.

The Land Retirement Demonstration Project (LRDP) was implemented in 1999 at two sites—one in the western San Joaquin Valley (Tranquility, managed by Reclamation) and the other in Tulare Lake Basin (Atwell Island, managed by the Bureau of Land Management (BLM))--to study the environmental impacts of land retirement and to evaluate cost-effective restoration strategies for retired lands.

The LRP obligated $400,000 of FY14 funds towards an inter-agency agreement with BLM to complete land acquisition and restoration activities at the Atwell Island LRDP site. This site is managed by BLM to further the LRP goals of drainage source reduction and wildlife habitat enhancement. It is anticipated that the LRP will not receive additional CVP Restoration funds after FY 14.

FY2014 Accomplishments

The program obligated $515,000 from the Restoration Fund, and $70,000 from the Water and Related Resources Fund during FY14. Table 23 lists the cumulative accomplishments of the Land Retirement Program (LRP).

Retire Agricultural Land

Over 9,300 acres of drainage impaired land have been acquired to date from willing sellers for the Land Retirement Demonstration Project (LRDP). Contacts with the multiple land owners were made for the acquisition of the remaining 750 acres at the Atwell Island project during FY14. No additional land was acquired from willing sellers by the program during FY 2014.

Restore Habitat

Ecological restoration treatments have been perfomed on over 6,800 acres of drainage impaired farmland that has been retired as a result of the LRDP. BLM planted two-hundred fifty pounds of locally grown seed at the Atwell Island site in the winter of 2014. A fair response of annual flora was observed during spring 2014 at the two restoration sites planted in 2013 as well as the 10 acres in the winter of 2014, contributing to the ongoing restoration of alkali sink habitat at the site. Twenty-five pounds of alkali Sacaton grass seed was harvested for grow out; grass plugs to be planting fall 2015.

Reduce Agricultural Drainage Volume

The program reduced the amount of agricultural drainage water on LRDP lands by approximately 3,600 acre-feet in FY 2014. Cumulative drainage reduction estimates were revised based on LRDP land use data provided by BLM.

Table 23: Land Acquired and Restored, and Drainage Reduction by Year, 1995-2014

	Overall Targets Acres Acquired	*Overall Targets* Acres Acquired	*Annual Targets* Acres Restored	*Annual Targets* Reduction in Agricultural Drainage (acre-feet)
Year	**Atwell Island (8,000 acres)**	**Tranquillity* (7,000 acres)**	**400 acres**	**6,000 acre-feet**
1995	0	591	0	236
1996	0	0	0	236
1997	0	0	0	236
1998	0	995	1,220	634
1999	0	60	100	658
2000	2,645	0	777	1,716
2001	1,414	444	702	1,992
2002	1,510	0	373	2,672
2003	616	0	261	2,772
2004	155	0	308	2,962
2005	625	0	349	3,275
2006	38	0	416	3,275
2007	213	0	475	3,275
2008	0	0	390	3,275
2009	0	0	380	3,275
2010	50	0	400	3,320
2011	0	0	260	3,361
2012	0	0	260	3,465
2013	0	0	197	3,585
2014	0	0	10	3,585
Total	**7,266**	**2,090**	**6,868**	**47,805****

* Land acquisition at the Tranquility site was deemed complete in 2001 with the retirement of approximately 100,000 acres of drainage problem lands by the Westlands Water District. Acreage shown reflect only USBR acquired lands.

** Reduction in Agricultural Drainage Total is cumulative from 1995-2014.

San Joaquin River Restoration Program Public Law 111-11

The San Joaquin River is a major tributary to the Sacramento-San Joaquin Delta, historically providing flows from the southern Central Valley. Section 3406(c)(1) mandates the preparation of a reasonable, prudent and feasible comprehensive plan to reestablish and sustain naturally reproducing salmon in the San Joaquin River below Friant Dam to the confluence with the Sacramento-San Joaquin Delta Estuary.

Subsequent to the passage of CVPIA, a Stipulation of Settlement (Settlement) was reached in September 2006 that resolved long-standing disputes related to Reclamation's operation of Friant Dam. The Settlement ended an 18-year lawsuit between the U.S. Departments of the Interior and Commerce, the Natural Resources Defense Council (NRDC) and the Friant Water Users Authority (FWUA).

Public Law 111-11 specifies that "…the Settlement satisfies and discharges all of the obligations of the Secretary contained in section 3406(c)(1)…" The San Joaquin River Restoration Program (SJRRP) implements the Settlement consistent with Public Law 111-11.

The agencies responsible for the management of the SJRRP include Reclamation (lead), the Service, National Marine Fisheries Service (NMFS), California Department of Water Resources (DWR), and California Department of Fish and Wildlife (CDFW). Actions to implement the Settlement are anticipated to be funded using four different funding sources in FY 2014. These include mandatory and appropriated funds in the San Joaquin River Restoration Fund, funds from the State of California, and funds from the CVP Restoration Fund. Actions to implement the Settlement will also be accomplished with in-kind services conducted by the State of California through the Department of Water Resources and Department of Fish and Wildlife. This description of program goals and objectives is intended to focus on those activities that are anticipated to be implemented using funds from the CVP Restoration Fund. See the Annual Report published by the San Joaquin River Restoration Program for a description of all of the Program's activities (annual reports are available at *http://www.restoresjr.net*).

Performance Measures

The Settlement includes two goals:

- **Water Management**. To reduce or avoid adverse water supply impacts to all of the Friant Division long-term contractors that may result from implementation of the Settlement. (The Settlement calls for interim flows and restoration flows, which are additional releases out of Friant Dam to support fish and wildlife habitat needs.)
- **Restoration**. To restore and maintain fish populations in "good condition" in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish.

FY 2014 Accomplishments

The Program obligated $1,936,000 from the Restoration Fund to achieve the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Projects. In FY 2014 and in support of the Restoration Goal, Reclamation funded a contract for ongoing work towards development of the Environmental Impact Statement/Environmental Impact Report for this project. The purpose of this project is to determine and implement a long-term solution to flow and fish routing in the Reach 4B / Eastside Bypass area of San Joaquin River and to provide for fish passage and juvenile rearing habitat in the selected route. The project is one of the high priority channel and structural improvements projects called for in Paragraph 11(a) and 11(b) of the Settlement.

The above accomplishments were achieved with CVPIA funding. To see all SJRRP accomplishments, visit *http://www.restoresjr.net*.

CHAPTER 6 - PROGRESS TO DATE TOWARD CVPIA PERFORMANCE GOALS

The CVPIA Program tracks performance targets from several sources including CPAR (goals based upon CVPIA), Interior goals (Performance Assessment and Rating Tool or PART) and program-defined goals. Listed below are goals by program for ongoing programs. The 2014 Accomplishment status is based upon the specific FY 2014 actions, cumulative Program to Date accomplishments, or a yearly average over the life of the program. At the bottom of the listing are completed or inactive programs and their status. Detailed assessments of progress toward the Central Valley fish doubling goals are found in the CAMP Annual Report at: *http://www.fws.gov/sacramento/Fisheries/CAMP-Program/Documents-Reports/Documents/2014_CAMP_Annual_Report.pdf.*

Performance Goal Description	Target	Reporting Period (Annual, Cumulative, or Average)	To Date (Cumulative or Average)	% of Target	Accomp-lishments	Comments
Fisheries						
Anadromous Fish Restoration Program (AFRP), 3406 (b)(1)						
Double the number of naturally produced, Central Valley wide, Fall-run Chinook	750,000 fish	1992-2013 average	359,613	48	404,269	
Double the number of naturally produced, Central Valley wide, Late Fall-run Chinook	68,000 fish	1992-2013 average	16,869	25	8,838	
Double the number of naturally produced, Central Valley wide, Winter-run Chinook	110,000 fish	1992-2013 average	6,273	6	7,798	
Double the number of naturally produced, Central Valley wide, Spring-run Chinook	68,000 fish	1992-2013 average	14,127	21	20,015	
Double the number of Central Valley wide Green Sturgeon	2,000 fish	1992-2009 average	2,946	147	N/A	
Double the number of Central Valley wide 15-year old, White Sturgeon	11,000 fish	1992-2009 average	6,237	57	N/A	
Double the number of Central Valley wide Striped Bass	2,500,000 fish	1992-2012 average	952,705	38	N/A	
Double the number of Central Valley wide American Shad	4,300 fish	1992-2013 average	2,206	51	309	
Cubic Yards of Spawning gravel placed in the American, Merced, and/or Tuolumne rivers.	unspecified	Annual	N/A	N/A	55,496	American was the only river with gravel placed this year
Complete 105 structural actions	105 actions	Cumulative	73	68	0	Merced River Ranch Floodplain and Channel Restoration Project was completed in November 2013

Performance Goal Description	Target	Reporting Period (Annual, Cumulative, or Average)	To Date (Cumulative or Average)	% of Target	Accomp-lishments	Comments
Contribute towards completion of 128 High and Medium Priority Actions	128 actions	Cumulative	46	36	0	Although no CPAR actions were completed in 2014, substantial progress was made on 38 individual projects in 20 separate watersheds.
Dedicated Project Yield, 3406 (b)(2)						
Provide instream flow, specified based on Wet, Dry, or Critically Dry year.	Dry Year target is 600,000 acre-feet	Annual	N/A	100	402,000	The total (b)(2) water allocation was 600 thousand acre feet (TAF) during the 2014 water year. However, due to these historically dry hydrological conditions, Interior was only able to make approximately 400,000 AF of the 600,000 AF of CVPIA (b)(2) water available.
Water Acquisition - Instream, 3406 (b)(3)						
Provide supplemental (b)(2) instream flow water	200,000 acre-feet	Average from 1994-2013	71,091	0	0	
Tracy Pumping Plant/Tracy Fish Test Facility, 3406 (b)(4)						
Complete 23 actions to mitigate for fishery impacts	23 mitigation actions	Cumulative	17	74	0	Secondary Louver Replacement project, Action #18 completed
Clear Creek Restoration, 3406 (b)(12)						
Restore stream channel	2 miles	Cumulative	1.5	75	0	
Place spawning gravel annually	25,000 tons (1)	Annual	N/A	N/A	7,700	7,700 tons (30.8%) projected
Meet variable flow target	Variable (cfs)	Annual	N/A	100	200	Ongoing operation
Maintain water temperature for optimum anadromous fish production	Maintain proper temperature 100% of the time	Annual	N/A	100 96		100% for 60°F 1-Jun to 14-Sep 96% for 56°F 15-Sep to 31-Oct 2013 data
Spawning Gravel, 3406 (b)(13)						
Place 10,000 tons of spawning gravel annually in the Sacramento River	10,000 tons	Annual	N/A	0	0	
Place 3,000 tons of spawning gravel annually in the Stanislaus River	3,000 tons	Annual	N/A	0	0	
Place 7,000 tons of spawning gravel annually in the American River	7,000 tons	Annual	N/A	143	10,000	
Increase the percentage of spawning salmonids using placed gravel in the Sacramento River	25% usage	Annual	N/A	304	76%	

Performance Goal Description	Target	Reporting Period (Annual, Cumulative, or Average)	To Date (Cumulative or Average)	% of Target	Accomp-lishments	Comments
Increase the percentage of spawning salmonids using placed gravel in the Stanislaus River	10% usage	Annual	N/A	280	28%	
Increase the density of redds on emplaced gravel in the American River	0.03 redds/ sq. meter	Annual	N/A	33	0.01	
Comprehensive Assessment and Monitoring Program, 3406 (b)(16)						
Create an Annual Report	1 Annual Report	Annual	1	100	1	
Management of CVPIA data	Unspecified	Annual	N/A	N/A	N/A	
Anadromous Fish Screens Program (AFSP), 3406 (b)(21)						
Screen all high priority diversions on prescribed streams	Unspecified	Cumulative	44	Undefined	3	
Trinity River Restoration Program (TRRP), 3406 (b)(23)						
Increase the escapment of Hatchery produced Fall-run Chinook Salmon	9,000 fish	1992-2013 Average	21,223	142	12,785	
Increase the escapment of Naturally produced Fall-run Chinook Salmon	62,000 fish	1992-2013 Average	21,025	27	16,689	
Increase the escapment of Hatchery produced Spring-run Chinook Salmon	3,000 fish	1992-2013 Average	7,493	195	5,835	
Increase the escapment of Naturally produced Spring-run Chinook Salmon	6,00 fish	1992-2013 Average	6,147	52	3,144	
Increase the escapment of Hatchery produced Coho Salmon	2,100 fish	1992-2013 Average	9,560	704	14,782	
Increase the escapment of Naturally produced Coho Salmon	1,400 fish	1992-2013 Average	2,025	308	4,305	
Increase the escapment of Hatchery produced Steelhead	10,000 fish	1992-2013 Average	9,268	68	6,816	
Increase the escapment of Naturally produced Steelhead	40,000 fish	1992-2013 Average	7,018	23	9,119	
Improve Infrastructure to allow ROD flows (369 TAF - 815 TAF)	Unspecified	Annual	Within target	100		
Provide minimum annual flows. The program releases between 369,000 and 815,000 AF each year, in accordance with the ROD	369,000	Annual	N/A	100	369,000	Based on 2014 as a critically dry water year
Trinity River Restoration Program (TRRP), 3406 (b)(1) Other						
Complete 47 channel rehabilitation projects in the Trinity mainstem and 3 side channels	47 projects	Cumulative	31	66	1	
Place 10,000 cubic yards of coarse sediment annually	10,000 cubic yards	Annual	N/A	36	3,620	

Performance Goal Description	Target	Reporting Period (Annual, Cumulative, or Average)	To Date (Cumulative or Average)	% of Target	Accomp-lishments	Comments
Reduce fine sediment delivery from tributary watersheds	10,000 to 20,000 cubic yards	Annual	N/A	78-155	15,500	
San Joaquin River Restoration Plan (SJRRP), 3406 (c)(1)						
Reduce or avoid water supply impacts to Friant Division long-term contractors	Unspecified	Annual	0	Undefined	0	
Restore and maintain fish populations in good condition	"Good" condition	Annual				
Ecological and Water Systems Models, 3406 (g)						
Develop readily usable and broadly available hydrologic and ecologic models and supporting data to evaluate existing and alternative water management strategies	9 hydrologic/ ecologic model-types	Cumulative	8	89	0	(2)
CVP Water Operations						
Reservoir Storage, 3406 (b)(19)						
Maintain minimum reservoir storage in Shasta Reservoir	1.9 MAF	Cumulative	14 of 16	88	1.16 MAF	
Maintain minimum reservoir storage in Trinity Reservoir	600 TAF	Cumulative	16 of 16	100	606 TAF	
Refuges						
Refuge Water Supply Program - Acquisition (INC L4), 3406 (b)(3) and 3406(d)(2)						
Acquire 133,264 acre-feet for Incremental Level 4 water acquisition	133,264 acre-feet	Annual	63,854	48	45,398	
Refuge Water Supply Program - Conveyance, 3406 (d)(1) & (d) (2)						
Provide Level 2 water supplies (Contract Year 2013)	422,251 acre-feet	Annual	N/A	64	387,611	
Provide Incremental Level 4 water supplies (Contract Year 2013)	133,264 acre-feet	Annual	N/A	32	42,243	Full L4 delivery = 296,467 (53% goal)
Refuge Water Supply Program - Construction (FULL L4 CAPACITY), 3406 (d)(5)						
Provide external conveyance capacity to 19 refuges to receive Full Level 4 Water annually	555,515 acre-feet	Cumulative	491,145	88		
Refuge Water Supply Program - Construction (Planning, Design & Construction), 3406 (d)(5)						
Planning, design & construction to provide conveyance capacity to deliver Full Level 4 water to 19 Refuges	19 refuges with adequate conveyance	Cumulative	15	79	0	
Other						
Habitat Restoration, 3406 (b)(1) Other						
Protect and/or restore habitat impacted by the CVP	Unspecified	Cumulative	118,765	N/A	3,042	
Protect and/or restore habitat areas specified by the SWRCB Decision 1641	45,391 acres	Cumulative	9,847	20	795	

Performance Goal Description	Target	Reporting Period (Annual, Cumulative, or Average)	To Date (Cumulative or Average)	% of Target	Accomp-lishments	Comments
Land Retirement, 3408(h)						
Retire 8,000 acres of Atwell Island land	8,000 acres	Cumulative, 1995–2014	7,266	91	0	
Retire 7,000 acres of Tranquility land	Complete	Cumulative, 1995–2014	7,000	100	N/A	
Restore 400 acres of retired land annually	400 acres	Cumulative, 1995–2014	6,868	86	10	
Reduce the production of agricultural drainage water by 6,000 AF through the removal of irrigation water from the parcels within the Land Retirement Demonstration Project	6,000 acre-feet	Cumulative, 1995–2014	47,805	60	0	

(1) Clear Creek spawning gravel replenishment goal was erroneously reported in the Final CPAR, 2009 as 17,000 tons annually. This unit of measure for this goal should have been cubic yards. Applying a conversion factor, 17,000 cubic yards of spawning gravel equates to approximately 25,000 tons. This correction first occurred in the 2012 Accomplishment Report and therefore, the percentage of annual goal for this year forward will appear smaller than past years of the same amounts of gravel.
(2) The Modeling Program is reviewing procedures to provide a more comprehensive reporting metric.

Complete and Inactive Programs

Program Name	Status
Modify CVP Operations, 3406 (b)(1)(B)	Incorporated into various programs
Contra Costa Canal Pumping Plant, 3406 (b)(5)	Complete
Shasta Temperature Control Device, 3406 (b)(6)	Complete
Meet Flow Standards and Objectives, 3406 (b)(7)	Complete
Short Pulse Flows, 3406 (b)(8)	Incorporated into various programs
Coleman National Fish Hatchery, 3406 (b)(11)	Complete
Delta Cross Channel and Georgiana Slough, 3406 (b)(14)	Inactive
Head of Old River Barrier, 3406 (b)(15)	Inactive
ACID Diversion Dam, 3406 (b)(17)	Complete
Glenn-Colusa Irrigation District Program, 3406 (b)(20)	Complete
Waterfowl Incentive Program, 3406 (b)(22)	Complete
Trinity River Restoration Program, 3406 (b)(23)	Complete
San Joaquin River Restoration Program, 3406 (c)(1)	Complete. Currently funded through Public Law 111-11
Stanislaus River Basin Water Needs Program, 3406 (c)(2)	Complete
Central Valley Wetlands Supply, 3406 (d)(6)	Complete
Supporting Investigations, 3406 (e)	Complete
Project Fisheries Impact Report, 3406 (f)	Complete
Water Conservation Program, 3408 (i)	Complete
Water Augmentation (Yield Study), 3408 (j)	Complete
Red Bluff Diversion Dam, 3406(b)(10)	Complete

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APPENDICES

Appendix A: Acronyms

AF	acre-feet
AFRP	Anadromous Fish Restoration Program
AFSP	Anadromous Fish Screen Program
ARRA	American Recovery and Reinvestment Act
ATR	Annual Technical Report
BDCP	Bay Delta Conservation Plan
BLM	Bureau of Land Management
BMP	Best Management Practices
BO	Biological Opinion
CAMP	Comprehensive Assessment Monitoring Program
CALFED	CALFED Bay-Delta Program
CCWD	Contra Costa Water District
CDFW	California Department of Fish and Wildlife
cfs	cubic feet per second
CPAR	CVPIA Program Activity Review Report
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CY	Contract year
DHCCP	Delta Habitat Conservation and Conveyance Program
DOI	Department of the Interior
DWR	Department of Water Resources
ECOSIM	Ecology Cogent Operations Suite of Integrated Models
EDT	Ecosystem Diagnostic and Treatment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EWSOMP	Ecosystem and Water Systems Operations Models Program
FWS	US Fish and Wildlife Service
FWA	Friant Water Authority
FY	Fiscal year
GCID	Glenn-Colusa Irrigation District
GWD	Grassland Water District
HGS	HydroGeoSphere
HRP	Habitat Restoration Program
IFIM	Instream Flow Incremental Methodology
Interior	Department of the Interior
IP	Implementation Plan
IRWMT	Interagency Refuge Water Management Team
LRP	Land Retirement Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic & Atmospheric Administration
NRDC	Natural Resources Defense Council
NWR	National Wildlife Refuge
OCAP	Operations Criteria and Plan
OMB	Office of Management and Budget
PART	Program Assessment Rating Tool
PEIS	Programmatic Environmental Impact Statement
POD	Pelagic Organism Decline
RBDD	Red Bluff Diversion Dam
RHEM	Riparian Habitat Establishment Model
ROD	Record of Decision
RPA	Reasonable and Prudent Alternative
RST	Rotary Screw Trap
RWSP	Refuge Water Supply Program
SDM	structured decision making
SJBAPL	San Joaquin Basin Action Plan Lands
SJBAP	San Joaquin Basin Action Plan
SJRA	San Joaquin River Agreement
SJRGA	San Joaquin River Group Authority
SJRR	San Joaquin River Restoration
SMUD	Sacramento Municipal Utility District
SNWR	Sacramento National Wildlife Refuge
SWP	State Water Project
TFCF	Tracy Fish Collection Facility
TRRP	Trinity River Restoration Program
USBR	Bureau of Reclamation

Appendix B: Glossary of Terms

- **Acre-foot (AF)**
  The quantity of water required to cover one acre to a depth of one foot: equal to 1,233.5 cubic meters (43,560 cubic feet)
- **Anadromous fish**
  Those stocks of salmon (including other species, e.g., steelhead, striped bass, white and green sturgeon, and American shad) that ascend the Sacramento and San Joaquin rivers and their tributaries and the Sacramento-San Joaquin Delta to reproduce after reaching maturity in San Francisco Bay or the Pacific Ocean; fish species that spend most of their lives in the ocean but reproduce in fresh water
- **Anadromous Fish Restoration Program (AFRP)**
  A program authorized by the CVPIA to address anadromous fish resource issues in Central Valley streams that are tributary to the Delta
- **Biota**
  Total collection of organisms of a geographic region or a time period
- **CALFED Bay-Delta Program**
  A unique collaboration among 25 state and federal agencies that came together to improve California's water supply and the ecological health of the San Francisco Bay/Sacramento-San Joaquin River Delta
- **Central Valley**
  Area in the central portion of California bounded by the Cascade Range to the north, the Sierra Nevada to the east, the Tehachapi Mountains to the south and the coast ranges and San Francisco Bay to the west
- **Central Valley Project (CVP)**
  As defined by Section 3403(d) of the CVPIA, "all Federal reclamation projects located within or diverting water from or to the watershed of the Sacramento and San Joaquin rivers and their tributaries as authorized by the Act of August 26, 1937 (50 Stat. 850) and all Acts amendatory or supplemental thereto, ..."
- **Central Valley Project water**
  As defined by Section 3403(f) of the CVPIA, "all water that is developed, diverted, stored, or delivered by the Secretary in accordance with the statutes authorizing the Central Valley Project in accordance with the terms and conditions of water rights acquired pursuant to California law."
- **Central Valley Project Improvement Act (CVPIA)**
  Public Law 102-575, Title 34. This law was passed in 1992 for the following purposes:
  - Protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California
  - Address impacts of the Central Valley Project on fish, wildlife and associated habitats
  - Improve the operational flexibility of the Central Valley Project
  - Increase water-related benefits provided by the Central Valley Project to the State of California through expanded use of voluntary water transfers and improved water conservation
  - Contribute to the State of California's interim and long-term efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary
  - Achieve a reasonable balance among competing demands for use of Central Valley Project water, including the requirements of fish and wildlife, agricultural, municipal and industrial and power contractors
- **Central Valley Habitat Joint Venture (CVHJV)**
  The association of federal and state agencies and private parties established for the purpose of developing and implementing the North American Waterfowl Management Plan as it pertains to the Central Valley of California
- **Central Valley Rivers and Streams**
  The 22 Central Valley main rivers and streams were defined in the January 9, 2001, Final Restoration Plan, Appendix B as: Sacramento River, Clear Creek, Cow Creek, Cottonwood Creek, Battle Creek, Paynes Creek, Antelope Creek, Mill Creek, Deer Creek, Miscellaneous creeks, Butte Creek, Big Chico Creek, Feather River, Yuba River, Bear River, American River, Mokelumne River, Cosumnes River, Calaveras River, Stanislaus River, Tuolumne River, and Merced River.
- **Constant fractional marking program (CFM)**
  When fish are counted for CVPIA monitoring, program managers differentiate between wild and hatchery fish; hatcheries mark a percentage of juveniles before they are released and when fish come back to spawn, the mark will indicate which were hatchery-born

- **Diversion**
  Area where river water is rerouted in a direction other than its natural course
- **Entrainment**
  When fish are diverted from their natural occurring water course (e.g., caught in a water pump or diverted from the river into an irrigation channel)
- **Environmental Impact Statement (EIS)**
  An analysis required by the National Environmental Policy Act (NEPA) for all major federal actions, which evaluates the environmental risks of alternative actions
- **Escapement**
  Measurement of adult spawning anadromous fish (e.g., salmon) that manage to return to their spawning stream
- **Firm water supplies**
  Non-interruptible water supplies guaranteed by the supplier to be available at all times except for reasons of uncontrollable forces or continuity of service provisions
- **Flow**
  The volume of water passing a given point per unit of time, usually in cubic feet per second (cfs)
- **Habitat**
  Area where a plant or animal lives
- **Level 2**
  A term used to refer to refuge water supply deliveries; the 1989 and 1992 Refuge Water Supply Studies define Level 2 refuge water supplies as the average amount of water the refuges received between 1974 and 1983
- **Level 4**
  A term used to refer to refuge water supply deliveries; Level 4 refuge water supplies are defined in the 1989 and 1992 Refuge Water Supply Studies as the amount of water for full development of the refuges based upon management goals developed in the 1980s
- **Measure**
  A type of program activity defined by the provisions of CVPIA that includes specific physical or structural actions
- **Metric**
  The defined quantifiable measurement of outputs or outcomes
- **Mitigation**
  One or all of the following: (1) Avoiding an impact by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating an impact over time by preservation and maintenance operations during the life of an action; and (5) compensating for an impact by replacing or providing substitute resources or environments
- **Natural Production**
  As defined by Section 3403(h) of the CVPIA, "fish produced to adulthood without direct human intervention in the spawning, rearing, or migration processes"
- **Outcome**
  The intended results or consequences to be achieved through implementing measures and programs described in the CVPIA
- **Output**
  The specific actions, measures, programs and services produced by Reclamation and the Service and provided to the public or others; outputs are the activities of the CVPIA Program to achieve the outcomes defined by the Act or developed by Reclamation and the Service to achieve the environmental restoration purposes
- **Pelagic Organism Decline**
  A recent decline in both abundance and species richness of pelagic (living in water above the bottom) organisms within the Sacramanto-San Joaquin Delta; pelagic organisms include, most notably, the delta smelt and longfin smelt, federally-listed endangered species of fish
- **Program**
  The overall effort to implement the provisions of CVPIA
- **Program Activity**
  The individual provisions of CVPIA that are being implemented by "program managers" at Reclamation and the Service
- **Program Manager**
  The staff at Reclamation and the Service that oversee implementation of the CVPIA program activities; each active program activity has a program manager from its respective agency
- **Redd Dewatering**
  Occurs when redds (fish egg "nests") are left exposed by receding water levels
- **Replacement Water**
  CVP Water that was provided to five refuges prior to CVPIA. It is to be replaced to the Project when available and acquired from willing sellers. Replacement water is delivered in addition to the Level 2 amounts specified in the CVPIA
- **Restoration Fund**
  The fund established by Section 3407 of the CVPIA to contribute resources for the environmental restoration provisions of the Act;

revenue comes into the fund primarily through surcharges on water and power contract rates

- **Restoration Fund Roundtable**
  A collective of stakeholders representing environmental organizations, federal and state resource agencies, water and power contractors, and other interested parties who meet as needed to discuss issues, news and activities related to the Central Valley Project Improvement Act (CVPIA) and provide information to Reclamation and the Service
- **Riparian**
  Of or relating to or located on the banks of a river or stream
- **South of Delta**
  The area that includes the State Water Project authorized place of use downstream of Harvey O. Banks Pumping Plant and the Central Valley Project authorized place of use downstream of Jones Pumping Plant
- **Stranding**
  Stranding is a term used to describe fish that are trapped in pools of water that have no connectivity to the larger stream because of insufficient flow
- **Target**
  The quantifiable or otherwise measurable characteristics that tell how well a program must accomplish a performance measure.
- **Taxa**
  Designating an organism or group of organisms
- **Timeframe**
  The period of time when program activities occur (e.g., annual or long term) that combine with a performance measure and target, establish a performance goal
- **Water Acquisition**
  The purchase of water from willing sellers
- **Weir**
  Type of fish ladder that utilizes a series of small dams and pools to create a long channel and allow spawning fish to get around an obstruction, like a dam
- **WY**
  Water year runs from October 1-September 30

Appendix C: CVPIA Title 34 of Public Law 102-575

Sections

Anadromous Fish Restoration Program – Section 3406 (b)(1)

"The Secretary … is authorized and directed to … develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels, attained during the period of 1967-1991." The section also states, "this goal shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool, for which a separate program is authorized under subsection 3406(c) of this title; Provided further, That the programs and activities authorized by this section shall, when fully implemented, be deemed to meet the mitigation, protection, restoration, and enhancement purposes established by subsection 3406(a) of this title; And provided further, That in the course of developing and implementing this program the Secretary shall make all reasonable efforts consistent with the requirements of this section to address other identified adverse environmental impacts of the Central Valley Project not specifically enumerated in this section."

Habitat Restoration Program – Section 3406 (b)(1) "other"

"…in the course of developing and implementing this program the Secretary shall make all reasonable efforts consistent with the requirements of this section to address other identified adverse environmental impacts of the CVP not specifically enumerated in this section."

Trinity River Restoration Program – Section 3406(b)(1) "other" and 3406(b)(23)

"…That in the course of developing and implementing this program the Secretary shall make all reasonable efforts consistent with the requirements of this section to address other identified adverse environmental impacts of the Central Valley Project not specifically enumerated in this section"; and

"In order to meet Federal trust responsibilities to protect the fishery resources of the Hoopa Valley Tribe, and to meet the fishery restoration goals of the Act of October 24, 1984, Pub. L. 98-541, provide through the Trinity River Division, for water years 1992 through 1996, an instream release of water to the Trinity River of not less than 340,000 acre-feet per year for the purposes of fishery restoration, propagation, and maintenance…"

Dedicated 800,000 acre-feet Project Yield – Section 3406 (b)(2)

"…dedicate and manage annually 800,000 acre-feet of Central Valley Project yield for the primary purpose of implementing the fish, wildlife, and habitat restoration purposes and measures authorized by this title; to assist the State of California in its efforts to protect the waters of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and to help meet such obligations as may be legally imposed upon the Central Valley Project under state or federal law following the date of enactment of this title, including but not limited to additional obligations under the federal Endangered Species Act…"

Water Acquisition Program - Instream Water – Sections 3406 (b)(3)

"The Secretary … is authorized and directed to develop and implement a program in coordination and in conformance with the plan required under paragraph (1) of this subsection for the acquisition of a water supply to supplement the quantity of water dedicated to fish and wildlife purposes under paragraph (2) of this subsection.… The program should identify how the Secretary intends to utilize, in particular the following options: improvements in or modifications of the operations of the project; water banking; conservation; transfers; conjunctive use; and temporary and permanent land fallowing, including purchase, lease, and option of water, water rights, and associated agricultural land."

Tracy (Jones) Pumping Plant Program – Section 3406 (b)(4)

"Develop and implement a program to mitigate for fishery impacts associated with operations of the Tracy Pumping Plant. Such program shall include, but is not limited to improvement or replacement of the fish screens and fish recovery facilities and practices associated with the Tracy Pumping Plant."

Flow Fluctuations and Reservoir Storage – Section 3406 (b)(9) and (b)(19)

"(9) Develop and implement a program to eliminate, to the extent possible, losses of anadromous fish due to flow fluctuations caused by the operation of any Central Valley Project storage or re-regulating facility…"

"(19) Reevaluate existing operational criteria in order to maintain minimum carryover storage at Sacramento and Trinity River reservoirs to protect and restore the anadromous fish of the Sacramento and Trinity Rivers in accordance with the mandates and requirements of this subsection and subject to the Secretary's responsibility to fulfill all project purposes, including agricultural water delivery."

Clear Creek Restoration Program – Section 3406 (b)(12)

"Develop and implement a comprehensive program to provide flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead from Whiskeytown Dam as determined by instream flow studies conducted by the California Department of Fish and Game after Clear Creek has been restored and a new fish ladder has been constructed at the McCormick-Saeltzer Dam…"

Spawning and Rearing Habitat Restoration Program – Section 3406 (b)(13)

"Develop and implement a continuing program … to restore and replenish spawning gravel…and rearing habitat … on the American, Stanislaus and Sacramento Rivers … shall include preventive measures…"

Comprehensive Assessment and Monitoring Program – Section 3406 (b)(16)

"…Establish, in cooperation with independent entities and the State of California, a comprehensive assessment program to monitor fish and wildlife resources in the Central Valley to assess the biological results and effectiveness of actions implemented pursuant to this subsection…."

Anadromous Fish Screen Program – Section 3406 (b)(21)

"Assist the State of California in efforts to develop and implement measures to avoid losses of juvenile anadromous fish ... measures shall include but shall not be limited to construction of screens on unscreened diversions, rehabilitation of existing screens, replacement of existing non-functioning screens, and relocation of diversions to less fishery-sensitive areas."

San Joaquin River Restoration Program – Section 3406 (c)(1)

"The Secretary shall " ... develop a comprehensive plan which is reasonable, prudent, and feasible to address fish, wildlife, and habitat concerns on the San Joaquin River, including but not limited to the streamflow, channel, riparian habitat, and water quality improvements that would be needed to reestablish where necessary and to sustain naturally reproducing anadromous fisheries from Friant Dam to its confluence with the San Francisco Bay/Sacramento-San Joaquin Delta Estuary."

Refuge Water Supply Program – Section 3406 (d)(1), 3406 (d)(2), 3406 (d)(5)

"3406 (d)(1)Upon enactment of this title, the quantity and delivery schedules of water measured at the boundaries of each wetland habitat area described in this paragraph shall be in accordance with Level 2 of the "Dependable Water Supply Needs" table for those habitat areas as set forth in the Refuge Water Supply Report and two-thirds of the water supply needed for full habitat development for those habitat areas identified in the "San Joaquin Basin Action Plan/ Kesterson Mitigation Action Plan Report…"

"3406 (d)(2) Not later than ten years after enactment of this title, the quantity and delivery schedules of water measured at the boundaries of each wetland habitat area described in this paragraph shall be in accordance with Level 4 of the "Dependable Water Supply Needs" table for those habitat areas as set forth in the "Refuge Water Supply Report" and the full water supply needed for full habitat development for those habitat areas identified in the "San Joaquin Basin Action Plan/ Kesterson Mitigation Action Plan Report..."

"3406 (d)(5) The Secretary is authorized and directed to construct or to acquire from non-Federal entities such water conveyance facilities, conveyance capacity, and wells as are necessary to implement the requirements of this subsection; provided, that such authorization shall not extend to conveyance facilities in or around the Sacramento-San Joaquin Delta Estuary..."

Ecosystem and Water Systems Operations Models – Section 3406 (g)

"The Secretary, in cooperation with the State of California and other relevant interests and experts, shall develop readily usable and broadly available models and supporting data to evaluate the ecologic and hydrologic effects of existing and alternative operations of public and private water facilities and systems in the Sacramento, San Joaquin, and Trinity River watersheds. The primary purpose of this effort shall be to support the Secretary's efforts in fulfilling the requirements of this title through improved scientific understanding concerning, but not limited to, the following:

(1) a comprehensive water budget of surface and groundwater supplies, considering all sources of inflow and outflow available over extended periods;

(2) related water quality conditions and improvement alternatives, including improved temperature prediction capabilities as they relate to storage;

(3) surface-ground and stream-wetland interactions;

(4) measures needed to restore anadromous fisheries to optimum and sustainable levels in accordance with the restored carrying capacities of Central Valley rivers, streams, and riparian habitats;

(5) development and use of base flows and channel maintenance flows to protect and restore natural channel and riparian habitat values;

(6) implementation of operational regimes at State and Federal facilities to increase springtime flow releases, retain additional floodwaters, and assist in restoring both upriver and downriver riparian habitats;

(7) measures designed to reach sustainable harvest levels of resident and anadromous fish, including development and use of systems of tradeable harvest rights;

(8) opportunities to protect and restore wetland and upland habitats throughout the Central Valley;

(9) measures to enhance the firm yield of existing Central Valley Project facilities, including improved management and operations, conjunctive use opportunities, development of offstream storage, levee setbacks, and riparian restoration."

Land Retirement – Section 3408 (h)

"The Secretary is authorized to purchase from willing sellers land and associated water rights and other property interests … which receives Central Valley Project water under a contract executed with the United States, and to target such purchases to areas deemed most beneficial to the overall purchase program, including the purposes of this title."