

Draft CVPIA Fiscal Year 2012 Annual Work Plan

June 20, 2011

Program Title: Anadromous Fish Restoration Program 3406(b)(1)

Responsible Entities:

Staff Name	Agency	Role
Kim Webb	Service	Lead
Tom Kisanuki	Reclamation	Co-Lead

Program Goals and Objectives for FY 2012

The goal of the Anadromous Fish Restoration Program (AFRP), as stated in Section 3406(b)(1) of the Central Valley Project Improvement Act (CVPIA), is 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". Section 3406(b)(1) also states that "this goal shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool".

The objectives for the AFRP can be found in the Final Restoration Plan for the Anadromous Fish Restoration Program (Restoration Plan)¹:

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

The Restoration Plan was completed in 2001 to guide the long-term development of the AFRP. The Restoration Plan provides a programmatic-level description of the AFRP and, is used to guide the implementation of all of the provisions of the CVPIA that contribute to the goal of making all reasonable efforts to at least double natural production of anadromous fish (AFRP doubling-goal). The following provisions contribute to accomplishing the goal of the AFRP (b)(1) program: (b)(1)(B), (b)(2), (b)(3), (b)(5), (b)(9), (b)(10), (b)(12), (b)(13), (b)(15), (b)(16), (b)(19), (b)(21), and 3406 (g). The Restoration Plan presents a list of reasonable actions and evaluations for each Central Valley watershed and a process by which actions and evaluations were determined to be reasonable. The Restoration Plan identifies the

¹ Final Restoration Plan for the Anadromous Fish Restoration Program, A Plan to Increase Natural Production of Anadromous Fish in the Central Valley of California. Released as a Revised Draft on May 30, 1997 and adopted as final on January 9, 2001. CVPIA, AFRP, Stockton, CA. [http://www.fws.gov/stockton/afrp/restplan_final.cfm].

need for partners, local involvement, public support, adaptive management, and flexibility as key attributes of the AFRP approach.

The AFRP is one of five CVPIA programs that has been integrated with the State of California through the Department of Fish and Game's Ecosystem Restoration Program (ERP) (Record of Decision, 2000)². To facilitate this integration, the above objectives are included in the CALFED ERP Draft Stage 1 Implementation Plan.³ These objectives are also complementary to other goals and objectives listed in the Draft Stage 1 Implementation Plan and would help address the objectives of the CALFED Multi-Species Conservation Strategy⁴ and the Biological Opinion on the Long Term Operations of the Central Valley Project and State Water Project⁵. The AFRP shares ERP's vision of the Single Blueprint concept which provides a unified and cooperative approach to restoration. The AFRP is committed to integrating its activities with the Ecosystem Restoration Program's actions and evaluations and using a scientifically-based adaptive management approach, consistent with the CALFED Science Program, to achieve AFRP objectives.

During FY 12 the AFRP will continue to evaluate opportunities to adopt the recommendations of the CVPIA Fisheries Independent Panel review⁶. In particular, AFRP will be using physical and biological metrics to capture ecosystem function, standardized methods and data management, develop hypotheses specific to the implementation of restoration actions, characterize pre-project existing conditions, and implement a monitoring program to evaluate project success. AFRP also supports recommendations to improve collaboration and coordination both within the CVPIA Programs, as well as with other programs focused on similar goals. AFRP will be working diligently to increase our efforts to integrate the CVPIA Fisheries Resource Area programs and implement actions comprehensively in a holistic ecosystem approach.

Status of the Program

The Restoration Plan presents the goal, objectives, and strategies of the AFRP, as well as a list of reasonable actions and evaluations for each Central Valley watershed. AFRP actions and evaluations implemented since 1995 have addressed environmental limiting factors listed in the AFRP Working Paper (Working Paper)⁷. These factors were identified by the AFRP technical team as limiting natural production of anadromous fish in Central Valley streams (i.e. instream flows, water temperature, loss of natural stream habitat, obstacles to fish passage, entrainment of juveniles at diversions, Central Valley Project and State Water Project Delta pumping operations, contaminants, and harvest). Prior to the

² Programmatic Record of Decision, CALFED Bay-Delta Program, August 28, 2000. Sacramento, CA.

³ Draft Stage 1 Implementation Plan, August 2001. Ecosystem Restoration Program, CALFED Bay-Delta Program. Sacramento, CA.

⁴ CALFED Bay-Delta Program Multi-Species Conservation Strategy. August 28, 2000. California Bay-Delta Program. Sacramento, CA.

⁵ Biological Opinion on the Long Term Operations of the Central Valley Project and State Water Project. June 4, 2009. USBR, Sacramento, CA.

⁶ USBR and USFWS. 2008. Listen to the River: An Independent Review of the CVPIA Fisheries Program. Prepared under contract with Circlepoint for the U.S. Bureau of Reclamation and the U.S. Fish and Wildlife Service. Sacramento, CA. [http://www.usbr.gov/mp/cvpia/docs_reports/indep_review/FisheriesReport12_12_08.pdf].

⁷ USFWS. 1995. Working paper on restoration needs, habitat restoration actions to double natural production of anadromous fish in the Central Valley of California, Volume 3, AFRP. [<http://www.fws.gov/stockton/afrp/workingpaper.cfm>].

completion of the Restoration Plan, the AFRP emphasized planning and environmental inventories. These were followed by implementation of habitat restoration projects and actions. Restoration Plan actions are implemented throughout the Central Valley watersheds in accordance with AFRP restoration priority criteria.

Progress made towards addressing the environmental limiting factor categories identified in the Working Paper and implementation of the restoration actions and evaluations in the Restoration Plan is available on the AFRP website (<http://www.fws.gov/stockton/afrp/>). About 23% of all Restoration Plan actions and evaluations (289) have been completed in the 1995 to 2010 time period. Of the 105 projects identified as high and medium priority structural actions and evaluations in the Restoration Plan, 62 (59%) have been completed. The CVPIA Program Activity Review Report⁸ identified 128 Restoration Plan high and medium priority actions that are “time certain” performance goals. Of the 128 actions, forty-six (36%) have been completed. Actions requiring annual or in perpetuity projects such as gravel augmentation (replacing gravel lost behind dams) and flow augmentation are reported under other provisions of the CVPIA such as the (b)(2), (b)(3), and (b)(13) programs.

The AFRP also documents its progress toward achieving its doubling goal targets by calculating anadromous fish natural production estimates that incorporate in-river and hatchery escapement, ocean and in-stream harvest, and the proportion of hatchery returns that spawn in-river⁷. The doubling goal targets for fall, late-fall, winter, and spring runs of Central Valley Chinook salmon are 750,000, 68,000, 110,000, and 68,000 respectively. The Central Valley Chinook salmon (all races) natural production average from 1992-2010 was 410,790 fish which dropped below the 1967-1991 baseline average Chinook salmon production of 497,054 as a result of the low returns of fall run fish in 2010 that totaled 102,735 fish. Average Chinook salmon natural production for the period 1992-2010 has exceeded the watershed doubling goal target on Clear, Butte, and Battle Creeks and is just below the goal on the Mokelumne River. Substantial gains in fish populations have been observed where investment in flow and passage has occurred (Butte, Battle, and Clear Creeks). Clear Creek and the Mokelumne River have also had a substantial investment in habitat restoration. Winter-run natural production numbers had continued to trend upward since 1994 until the poor returns from the last four years (2007-2010). Spring-run numbers have trended upwards since 1991, but production was reduced in 2008, 2009, and 2010. Fall-run natural production has decreased to the baseline levels due to the recent stock collapse observed in 2007-2010. Late fall-run production had increased greatly since the low period (1993-1997) but continued to decline in 2010. Data on Chinook salmon doubling can be found in the Chinookprod file on the AFRP website (<http://www.fws.gov/stockton/afrp/>). Progress for the AFRP production targets for white and green sturgeon, American shad, and striped bass are reported under the (b)(16) provision in the CAMP annual report (http://www.fws.gov/sacramento/Fisheries/CAMP-Program/Documents-Reports/Documents/2010_CAMP_annual_report.pdf). 2011 production numbers are not yet reported but will be updated when the data becomes available in April 2012.

Adaptive Management

The CVPIA Fisheries Resource Area programs will implement a science-based management framework that uses an adaptive management process. Adaptive management is a structured, iterative process of optimal decision making that emphasizes designing experiments to address key uncertainties, monitoring outcomes, analyzing and learning, improving management actions, and continually evaluating and

⁸ USBR. 2009. Central Valley Project Improvement Act Program Activity Review Report. Sacramento, CA [http://www.usbr.gov/mp/cvpia/docs_reports/docs/2009_Final%20CPAR%20Report%208-25-09.pdf].

refining program actions. The AFRP will build on the existing framework put forth in the CVPIA Record of Decision; the Final Restoration Plan; the recommendations from the CVPIA Fisheries Independent Review Panel; and lessons learned to-date in implementing CVPIA. In addition, the CVPIA Fisheries Resource Area programs will use information obtained from the adaptive management process and the program will be managed so that incremental benefits are gained, new knowledge is obtained, and progress is made towards program goals and establishing natural ecosystem functions.

Specifically for FY12, AFRP is proposing to fund projects that were planned and prioritized from information obtained in FY11 from monitoring, evaluations, studies, and research. Sturgeon studies in FY11 experimented with egg mats and underwater video survey techniques to identify and map sturgeon habitat. Consequently, four green sturgeon adults were found at the pool downstream of Daguerre Point Dam in the Yuba River and 24 white sturgeon eggs were sampled in the San Joaquin River. This information will be used to spatially and temporarily focus our FY12 sampling efforts in the Yuba River, Feather River, and lower San Joaquin River.

In 2010 and 2011, AFRP began implementing floodplain and spawning habitat restoration projects in the American River and Merced River where project monitoring and evaluations provided additional insight for planning future phases of these projects. In the American River, the side channel at Upper Sunrise provided excellent steelhead spawning habitat. However during 2006, high flows incised the river along the north side which de-watered the side channel. In 2008 the CVPIA (b)(13) program cut and widened the side channel so that it inundated at a greater range of flows. The project reduced steelhead stranding but also inadvertently reduced Chinook salmon and steelhead spawning and rearing habitat. Consequently, AFRP and the (b)(13) programs in a collaborative effort developed a new alternative that would fill in the main channel at the head-cut to create greater head pressure whereby allowing flow once again through the side channel. Monitoring at the Upper Sunrise Project revealed immediate response from Chinook salmon and steelhead moving up into the side channel to spawn after completion of the project.

Alternatively, in the Merced River, preliminary assessment of coarse bed material available on the floodplain at the Merced River Ranch (MRR) estimated that the total volume of tailings was 3,215,000 yds³, with an approximate composition of 28.9% oversized fill (929,437 yds³), 66.5% spawning gravel (2,136,488 yds³), and 4.6% fines (149,075 yds³) for a total of 3,065,925 yds³ of usable material. During our first year of the screening process of the tailing piles at MRR, we observed slightly different proportions of materials and now have some revised calculations based on this work. Our estimates from construction suggest that actual composition within the 2010 work area is 12.5% oversized fill, 80.0% spawning gravel, and 7.5% fines. From this work, we now have revised estimates of total material available for the current restoration project activities proposed for FY12 and available for other future projects.

Preliminary reports, fish monitoring, and assessments regarding fish passage barriers, relative temporal and spatial flows, as well as potential restoration opportunities have been completed by the California Department of Fish and Game (CDFG) and the USFWS. Additionally, the Lower Antelope Creek Geomorphology Study preliminary report determined that there was an additional need to collect stream gage data and hydraulic modeling in order to develop fish passage restoration actions. This information was used to prioritize and plan FY12 fish passage projects and studies in Deer Creek, Cow Creek, and Antelope Creek.

In FY11, AFRP staff worked with multiple water agencies to coordinate fall pulse flows in the San

Joaquin River Basin tributaries, Mokelumne River, American River, and Sacramento River. The program continued monitoring and evaluation to assess the effectiveness of these measures by implementing redd dewatering studies and collecting real-time monitoring data through fish counting weirs. For example, in FY 11 the AFRP worked with the East Bay Municipal Utility District (EBMUD) and other signatories of the Lower Mokelumne Joint Settlement Agreement to adaptively manage the watershed and coordinate fall pulse flows (64,000 acre feet) in an effort to improve adult Chinook salmon returns. These efforts led to the development of a pilot project that incorporated the management of the fall pulse flows in October and the closing of the Delta Cross Channel gates to minimize adult straying of Mokelumne origin Chinook salmon. Preliminary results of this experiment are very promising and may assist AFRP meet its watershed doubling goal in this watershed. The program will continue to use the adaptive management process to design experiments that will improve management actions and inform the development of future projects.

Table 1. FY2012 Activities and Costs

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding						
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources	
1.1	Program Management													
1.1.1	0.20	CVPIA Program Management and Supervision	FWS	-	-			\$0	\$0	\$43,733	\$0	\$0	\$43,733	
1.1.2	0.80	USFWS co-lead - Program Manager	FWS	-	-			\$0	\$0	\$189,549	\$0	\$0	\$189,549	
1.1.3	0.10	USBR Northern Valley Coordination	BOR	-	-			\$0	\$0	\$24,864	\$0	\$0	\$24,864	
1.1.4	1.00	USFWS Assistant Program Manager - Directs the day to day program activities, develops annual work plan, manages program budget.	FWS	-	-			\$0	\$0	\$236,936	\$0	\$0	\$236,936	
								Anticipated Funding						
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources	
								Subtotal Funding	\$0	\$0	\$495,082	\$0	\$0	\$495,082
								Reclamation			\$24,864	\$0	\$0	\$24,864
								Service			\$470,218	\$0	\$0	\$470,218
								CA DFG	\$0	\$0			\$0	\$0
								CA DWR	\$0	\$0			\$0	\$0
								Other*	\$0	\$0			\$0	\$0
* List other funding source here:								None						

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.2	Program Support												
1.2.1		0.75	Habitat Restoration Coordinator for Mokelumne, Cosumnes, and Lower Sacramento River- manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$177,702	\$0	\$0	\$177,702
1.2.2		0.50	Habitat Restoration Coordinator for Merced River - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$118,468	\$0	\$0	\$118,468
1.2.3		0.50	Habitat Restoration Coordinator for Tuolumne and San Joaquin Rivers - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$118,468	\$0	\$0	\$118,468
1.2.4		1.00	Habitat Restoration Coordinator for the Stanislaus River - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$236,936	\$0	\$0	\$236,936
1.2.5		1.00	Habitat Restoration Coordinator for the Feather, Yuba, and American Rivers - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$236,936	\$0	\$0	\$236,936
1.2.6		1.00	Habitat Restoration Coordinator for Battle, Big Chico, and Butte creeks - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$239,608	\$0	\$0	\$239,608
1.2.7		1.00	Habitat Restoration Coordinator for Antelope, Cottonwood, Cow, Deer, and Mill creeks - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$239,608	\$0	\$0	\$239,608
1.2.8		1.00	Assistant Habitat Restoration Coordinator - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$236,936	\$0	\$0	\$236,936

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.2.9		1.00	Assistant Habitat Restoration Coordinator for the Calaveras, Yuba, and American Rivers - manage contracts and grants, develop projects, facilitate communication and environmental permitting, provide outreach, and analyze and report data.	FWS	-	-		\$0	\$0	\$236,936	\$0	\$0	\$236,936
1.2.10		0.26	Regional Budget and Contracting Support	FWS	-	-		\$0	\$0	\$56,473	\$0	\$0	\$56,473
1.2.11		0.35	Region 8 Program Administration - USFWS Pacific Southwest Management/Admin	FWS	-	-		\$0	\$0	\$76,641	\$0	\$0	\$76,641
								Anticipated Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	State or Other Sources*	Total All Sources
								\$0	\$0	\$1,974,712	\$0	\$0	\$1,974,712
										\$0	\$0	\$0	\$0
										\$1,974,712	\$0	\$0	\$1,974,712
								\$0	\$0			\$0	\$0
								\$0	\$0			\$0	\$0
								\$0	\$0			\$0	\$0
								* List other funding source here:					
								None					

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.4	Restoration Actions												
1.4.1	-		Merced River Snelling Floodplain Restoration Project (Phase 2 - Implementation) will restore up to 80 acres of riparian floodplain habitat and 2 stream miles for Fall Chinook and Steelhead. This project is upstream of the CALFED ERP Merced River Robinson Ranch Salmon Habitat Enhancement Project (2001-C200) and compliments this multi-phased restoration of the Merced River; FRP Action 3 and Evaluation 2; Ongoing Project; Stockton FWS	FWS	-	b1:Area of floodplain hab rest (acres)	80 acres	\$0	\$0	\$294,925	\$0	\$0	\$294,925
1.4.2	-		Merced River Snelling Channel Restoration Project (Phase 2 - Implementation) will restore up to 2 miles of in-channel habitat by restoring and replenishing gravel and reconfiguring "ponded" sections of the river to benefit Fall Chinook and Steelhead. This project is upstream of the CALFED ERP Merced River Robinson Ranch Salmon Habitat Enhancement Project (2001-C200) and compliments this multi-phased restoration of the Merced River; FRP Action 3 and Evaluation 2; Ongoing Project; Stockton FWS	FWS	-	b1:Contribute towards Priority Actions; b1:Stream Channel restored (miles)	Address 1 of the 128 Priority Actions and restore 2 miles of stream channel	\$0	\$0	\$323,266	\$0	\$0	\$323,266
1.4.3	-		Merced River Ranch Floodplain Enhancement Project (Phase 2 continue implementation and process an additional 30,000 cubic yards of gravel) will restore 6 acres of riparian floodplain and 1.23 miles of spawning habitat to benefit Fall Chinook and Steelhead. This project is a cooperative effort between the USFWS and the CDFG; FRP Action 3 and Evaluation 2; Ongoing Project; Stockton FWS	FWS	-	b1:Contribute towards Priority Actions; b1:Area of floodplain hab rest (acres); b1:Stream Channel restored (miles); b1:Spawning gravel placed (Cu.Yds.)	Address 1 of the 128 Priority Actions; restore 6 acres of floodplain habitat; restore 1.23 miles of stream channel; and place 30,000 Cu. Yds. of spawning gravel	\$0	\$0	\$409,650	\$0	\$0	\$409,650

	CVPIA Section: 3406 (b)(1)
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2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.4.4	-		Yuba River Hammon Bar Pilot Restoration Project (Phase 2 - Implementation and Post-project Monitoring) will restore up to 5 acres of riparian floodplain and 3.5 miles of rearing habitat for Fall Chinook, Spring Chinook, and Steelhead. This project is a cooperative effort between the USFWS, U.S. Bureau of Land Management (BLM), CDFG, Yuba County Water Agency, South Yuba River Citizens League, and Western Aggregates Inc.; FRP Evaluation 4; Stockton FWS	FWS	-	b1:Contribute towards Priority Actions; b1:Area of floodplain hab rest (acres); b1:Stream Channel restored (miles)	Address 1 of the 128 Priority Actions; restore 5 acres of floodplain habitat; and restore 3.5 miles of stream channel	\$0	\$0	\$159,000	\$0	\$0	\$159,000
1.4.5	-		Lower American River Spawning and Rearing Habitat Restoration Project (Implementation) will restore up to 1 mile of spawning habitat with 5,000 cubic yards of gravel per year and 1 acre of rearing habitat for Fall Chinook and Steelhead. This project is being co-implemented with the 3406 (b)(13) program, Sacramento Area Water Forum, and CDFG; FRP Action 5; Stockton FWS	FWS	-	b1:Spawning gravel placed (Cu.Yds.); b1:Stream Channel restored (miles)	5000 Cu. Yds of spawning gravel and restore 1 mile of stream channel	\$0	\$0	\$159,000	\$0	\$0	\$159,000
1.4.6	-		Cosumnes River and Delta Cougar Wetland Restoration Project (Phase 2 Implementation and Monitoring) will restore up to 85 acres of riparian and tidal shallow water-habitat for Fall Chinook and Steelhead. This project is a collaborative effort between the USFWS, BLM, USCOE, CDWR, and Ducks Unlimited whom have leveraged \$700,000 towards the implementation of this project; FRP Delta Evaluation 4 and 6; Stockton FWS	FWS	-	b1:Contribute towards Priority Actions; b1:Area of floodplain hab rest (acres)	Address 1 of the 128 Priority Actions; restore 85 acres of floodplain habitat	\$0	\$0	\$53,000	\$0	\$0	\$53,000
1.4.7	-		Stanislaus River Two Mile Bar Restoration Project will provide funds to augment 3406 (b)(13) project to clean gravel onsite and apply gravel in river, while restoring hydrological function to perched floodplain habitat. This project will restore up to 1500 feet of spawning habitat with 60,000 cubic yards of gravel and 9.3 acres of rearing habitat for Fall Chinook and Steelhead; FRP Action 2; Stockton FWS	FWS	III.2.1	b1:Spawning gravel placed (Cu.Yds.); b1:Area of floodplain hab rest (acres)	60,000 Cu. Yds of spawning gravel and restore 9.3 acres of floodplain habitat	\$0	\$0	\$212,000	\$0	\$0	\$212,000

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	CVPIA Program: Anadromous Fish Restoration

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Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.4.8	-		Deer Creek: Lower Falls Fish Passage Improvement Project (Phase 1) will fund a feasibility study and final design to remediate the Lower Deer Creek Falls ladder which was constructed in 1943. This project will improve access to 5.75 stream miles for fall-run, late fall-run, spring-run Chinook, and steelhead; Red Bluff FWS	FWS	1.3.5	b1:River opened to fish passage (miles)	5.75 miles	\$0	\$0	\$84,800	\$0	\$0	\$84,800
1.4.9	-		Cow Creek Cook and Butcher Diversion Fish Passage Project will fund a feasibility study and final design of remediation of the Cook and Butcher diversion. This project will improve access to 8 stream miles for fall run Chinook salmon and steelhead; FRP Actions 2 and 3; Red Bluff FWS	FWS	-	b1:Contribute towards Priority Actions; b1:River opened to fish passage (miles)	Address 1 of the 128 Priority Actions and open 8 miles to fish passage	\$0	\$0	\$74,200	\$0	\$0	\$74,200
1.4.10	-		Cottonwood Creek: South Fork Cottonwood Ladder Fish Passage Improvement Project (Phase 1) will fund a feasibility study and final design to remediate the ladder. This project will improve access to 5.3 stream miles for fall-run and steelhead; Red Bluff FWS	FWS	-	b1:River opened to fish passage (miles)	5.3 miles	\$0	\$0	\$34,198	\$0	\$0	\$34,198
								Anticipated Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	State or Other Sources*	Total All Sources
								\$0	\$0	\$1,804,039	\$0	\$0	\$1,804,039
										\$0	\$0	\$0	\$0
										\$1,804,039	\$0	\$0	\$1,804,039
								\$0	\$0			\$0	\$0
								\$0	\$0			\$0	\$0
Subtotal Funding								\$0	\$0			\$0	\$0
Reclamation													
Service													
CA DFG								\$0	\$0			\$0	\$0
CA DWR								\$0	\$0			\$0	\$0
Other*								\$0	\$0			\$0	\$0
* List other funding source here:								None					

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.5	Research (Evaluations, Studies, Investigations)												
1.5.1	0.50	San Joaquin River Sturgeon Acoustic Study; FRP Evaluation 4; Stockton FWS (see Table 3)		FWS	-	b1:# Green Sturgeon	1,966	\$0	\$0	\$118,468	\$0	\$0	\$118,468
1.5.2	-	Contaminants, Age, and Growth Study for Sturgeon; FRP Central Valley Evaluation 6 and 8; Stockton FWS (see Table 3)		FWS	-	b1:# White Sturgeon	11,142	\$0	\$0	\$212,000	\$0	\$0	\$212,000
1.5.3	-	Stanislaus River Juvenile Chinook and O. mykiss Mortality Study; FRP Evaluation 2; Stockton FWS (see Table 3)		FWS	IV.2.2	b1:# Steelhead	13,000	\$0	\$0	\$212,000	\$0	\$0	\$212,000
1.5.4	0.50	San Joaquin River Sturgeon Habitat Assessment; FRP Evaluation 4; Stockton FWS (see Table 3)		FWS	-	b1:# Green Sturgeon	1,966	\$0	\$0	\$118,468	\$0	\$0	\$118,468
1.5.5	-	San Joaquin River Sturgeon Habitat Assessment; FRP Evaluation 4; (Bathymetry and Habitat Mapping with USGS); Stockton FWS (see Table 3)		FWS	-	b1:# Green Sturgeon	1,966	\$0	\$0	\$75,658	\$0	\$0	\$75,658
1.5.6	-	Mill & Deer Creeks Wild Juvenile Chinook Acoustic Tagging Investigations; Red Bluff FWS (see Table 3)		FWS	-	b1:# Spring-run Chinook Nat Prod	68,000	\$0	\$0	\$212,000	\$0	\$0	\$212,000
1.5.7	-	Lower Antelope Creek Geomorphology Study will gather additional data (i.e. topography, water quality, and discharge) to develop fish passage restoration actions in Lower Antelope Creek; FRP Evaluation 1; Red Bluff FWS (see Table 3)		FWS	-	b1:River opened to fish passage (miles)	32 miles	\$0	\$0	\$164,300	\$0	\$0	\$164,300
								Anticipated Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	State or Other Sources*	Total All Sources
								\$0	\$0	\$1,112,894	\$0	\$0	\$1,112,894
										\$0	\$0	\$0	\$0
										\$1,112,894	\$0	\$0	\$1,112,894
								\$0	\$0			\$0	\$0
								\$0	\$0			\$0	\$0
								\$0	\$0			\$0	\$0
* List other funding source here:								None					

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.8	Planning												
1.8.1		-	CDFG Habitat Restoration Coordinators; Funding is for the continued support of three CDFG senior or equivalent biologists, one each from the Cooperator's Region 1 (Upper mainstem Sacramento River and tributaries from Keswick Dam south to, and including, Butte Creek on the east side and to Colusa Basin Drain on the west side of the upper mainstem of the Sacramento River) , Region 2 (Lower Sacramento River and Delta tributaries from the Feather River south to the Calaveras River (including the Feather, Yuba, American, Cosumnes, and Mokelumne rivers), and Region 4 (Sacramento-San Joaquin Delta and mainstem San Joaquin River including the Merced, Tuolumne, and the Stanislaus rivers), to act as Habitat Restoration Coordinators (HRCs). The State HRCs will continue to play a role in the interagency team with the AFRP to coordinate, develop, and implement restoration actions consistent with the Final Restoration Plan. CDFG will cost share up to 44% of the total cost of \$498,169.	FWS	-	-		\$0	\$204,896	\$293,273	\$0	\$0	\$498,169
								Anticipated Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	State or Other Sources*	Total All Sources
								\$0	\$204,896	\$293,273	\$0	\$0	\$498,169
								Subtotal Funding		\$0	\$0	\$0	\$0
								Reclamation		\$293,273	\$0	\$0	\$293,273
								Service		\$0	\$0	\$0	\$0
								CA DFG		\$0	\$0	\$0	\$0
								CA DWR		\$0	\$0	\$0	\$0
								Other*		\$0	\$204,896	\$0	\$204,896
								* List other funding source here: State funding is discretionary, non-mandatory, and not covered in SCAMPI.					

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
<u>Total Funding</u>	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding						
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources	
1.12	Monitoring													
1.12.1	0.05	Stanislaus River Honolulu Bar post-restoration monitoring of macro-invertebrates to evaluate restored floodplain and side-channel habitat and food production for juvenile salmonids (See Table 3); Sacramento FWS		FWS	-	-		\$0	\$0	\$10,000	\$0	\$0	\$10,000	
								Anticipated Funding						
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	State or Other Sources*	Total All Sources	
								Subtotal Funding	\$0	\$0	\$10,000	\$0	\$0	\$10,000
								Reclamation			\$0	\$0	\$0	\$0
								Service			\$10,000	\$0	\$0	\$10,000
								CA DFG	\$0	\$0			\$0	\$0
								CA DWR	\$0	\$0			\$0	\$0
Other*	\$0	\$0	\$0	\$0										
* List other funding source here:								None						

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
<u>Total Funding</u>	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
<i>Reclamation</i>			\$24,864	\$0	\$0	\$24,864
<i>Service</i>			\$6,050,136	\$0	\$0	\$6,050,136
<i>CA DFG</i>	\$0	\$0			\$0	\$0
<i>CA DWR</i>	\$0	\$0			\$0	\$0
<i>Other</i>	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.13	Modeling												
1.13.1		0.32	Sacramento FWO staffing costs to support work on Antelope Creek Geomorphology Study. Site-specific topographic surveys to describe channel geometry at distributary junctions and hydraulic modeling to assess sensitivity of hydraulic controls on various flow paths and fish passage conditions will be conducted.	FWS	-	-		\$0	\$0	\$70,000	\$0	\$0	\$70,000
1.13.2		0.05	Sacramento FWO staff will collect supplemental topography data in channel cross sections to support work on the Cottonwood Creek Geomorphological Analysis.	FWS	-	-		\$0	\$0	\$10,000	\$0	\$0	\$10,000
1.13.3		0.05	Sacramento FWO staff will collect topographic survey data to assess channel change at the Cottonwood Creek ACID Project Area.	FWS	-	-		\$0	\$0	\$10,000	\$0	\$0	\$10,000
1.13.4		0.23	Cottonwood Creek Habitat Assessment - Sacramento FWO staff will collect PHABSIM data at existing geomorphology transect locations, map the habitat, and quantify the amount of fry and juvenile fall run Chinook salmon and steelhead habitat.	FWS	-	-		\$0	\$0	\$50,000	\$0	\$0	\$50,000
1.13.5		0.11	North Fork Cottonwood Creek Fish Habitat Assessment - conduct an assessment of adult spring run Chinook salmon holding habitat.	FWS	-	-		\$0	\$0	\$25,000	\$0	\$0	\$25,000
1.13.6		0.05	Yuba/Feather Sturgeon HSI - collect depth, velocity, and substrate data at sturgeon spawning locations in the Yuba and Feather rivers and develop sturgeon spawning habitat criteria.	FWS	-	-		\$0	\$0	\$10,000	\$0	\$0	\$10,000
1.13.7		0.15	Stanislaus River Lancaster Road Post-restoration monitoring - conduct a second round of post-restoration topography data collection to assess the effects of high flows on the restored channel topography.	FWS	-	-		\$0	\$0	\$30,000	\$0	\$0	\$30,000

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding												
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources							
1.13.8		0.45	Stanislaus River Flow and Floodplain Modeling - SFWO staff will develop and run a hydraulic model of the Stanislaus River to quantify the relationship between flows and the area of inundated floodplain.	FWS	-	-		\$0	\$0	\$100,000	\$0	\$0	\$100,000							
1.13.9		0.32	Tuolumne River Bobcat Flat Post-restoration monitoring - collect post-construction hydraulic and habitat data and conduct pre- and post- construction hydraulic and habitat modeling to determine how much spawning and rearing habitat was created by the restoration project.	FWS	-	-		\$0	\$0	\$70,000	\$0	\$0	\$70,000							
1.13.10		0.05	Yuba River Hammon Bar Monitoring - collect topography data for post-construction monitoring evaluation.	FWS	-	-		\$0	\$0	\$10,000	\$0	\$0	\$10,000							
								Anticipated Funding												
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	State or Other Sources*	Total All Sources							
								Subtotal Funding							\$0	\$0	\$385,000	\$0	\$0	\$385,000
								Reclamation									\$0	\$0	\$0	\$0
								Service									\$385,000	\$0	\$0	\$385,000
								CA DFG							\$0	\$0			\$0	\$0
								CA DWR							\$0	\$0			\$0	\$0
								Other*							\$0	\$0			\$0	\$0
* List other funding source here:								None												

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.16	Unfunded Needs												
1.16.1	-		Cottonwood Creek: South Fork Cottonwood Ladder Fish Passage Improvement Project, Phase 1	FWS	-	b1:River opened to fish passage (miles)	unspecified	\$0	\$0	\$50,775	\$0	\$0	\$50,775
1.16.2	-		Deer Creek: Impacts of illegal marijuana activity on fish - Phase I: Develop sampling protocol	FWS	-	b1:# Spring-run Chinook Nat Prod	68,000	\$0	\$0	\$79,500	\$0	\$0	\$79,500
1.16.3	-		Sacramento River: Extent of Sacramento River Green Sturgeon Spawning Habitat Spatial Distribution Investigation (#2)	FWS	-	b1:# Green Sturgeon	1,966	\$0	\$0	\$413,400	\$0	\$0	\$413,400
1.16.4	-		Feather River: Sturgeon Detection Using a Didson Camera	FWS	-	b1:# Green Sturgeon	1,966	\$0	\$0	\$111,247	\$0	\$0	\$111,247
1.16.5	-		Sacramento River: Green Sturgeon Juvenile Overwintering Migration Investigation	FWS	-	b1:# Green Sturgeon	1,966	\$0	\$0	\$109,222	\$0	\$0	\$109,222
1.16.6	-		Cottonwood Creek: Anadromous Juvenile Salmonid Monitoring and Limiting Factor Analysis	FWS	-	b1:# Fall-run Chinook Nat Prod	750,000	\$0	\$0	\$106,000	\$0	\$0	\$106,000
1.16.7	-		Butte Creek: Chinook Escapement Monitoring	FWS	-	b1:# Spring-run Chinook Nat Prod	68,000	\$0	\$0	\$159,000	\$0	\$0	\$159,000
1.16.8	-		Cow Creek: Anadromous Juvenile Salmonid Monitoring and Limiting Factor Analysis	FWS	-	b1:# Fall-run Chinook Nat Prod	750,000	\$0	\$0	\$106,000	\$0	\$0	\$106,000
1.16.9	-		Payne's Creek: Adult Assessment, Phase 1	FWS	-	b1:# Fall-run Chinook Nat Prod	750,000	\$0	\$0	\$106,000	\$0	\$0	\$106,000
1.16.10	-		Cosumnes River Juvenile Outmigration Monitoring	FWS	-	b1:# Fall-run Chinook Nat Prod	750,000	\$0	\$0	\$60,420	\$0	\$0	\$60,420
1.16.11	-		Cougar Wetlands Tidal Restoration Project	FWS	-	b1:Area of floodplain hab rest (acres)	unspecified	\$0	\$0	\$431,621	\$0	\$0	\$431,621
1.16.12	-		Contaminants, Age, and Growth Study for Sturgeon	FWS	-	b1:# White Sturgeon	11,142	\$0	\$0	\$212,000	\$0	\$0	\$212,000
1.16.13	-		American River Juvenile Outmigration Monitoring	FWS	-	b1:# Fall-run Chinook Nat Prod	750,000	\$0	\$0	\$424,000	\$0	\$0	\$424,000
1.16.14	-		Yuba River Narrows Habitat Enhancement Project	FWS	-	b1:Spawning gravel placed (tons)	unspecified	\$0	\$0	\$530,000	\$0	\$0	\$530,000

	CVPIA Section: 3406 (b)(1)
	CVPIA Program: Anadromous Fish Restoration

2012 Requested Funding						
	State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
Total Funding	\$0	\$204,896	\$6,075,000	\$0	\$0	\$6,279,896
Reclamation			\$24,864	\$0	\$0	\$24,864
Service			\$6,050,136	\$0	\$0	\$6,050,136
CA DFG	\$0	\$0			\$0	\$0
CA DWR	\$0	\$0			\$0	\$0
Other	\$0	\$204,896			\$0	\$204,896

AWP Activity Number	Type of Activity	# of FTE's	Activity Name & Description	Agency	NMFS OCAP RPA#	Performance Metric	Performance Target	2012 Requested Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	Other Sources*	Total All Sources
1.16.15	-		Stanislaus River Lovers Leap Floodplain Restoration Project	FWS	III.2.3	b1:Area of floodplain hab rest (acres)	unspecified	\$0	\$0	\$530,000	\$0	\$0	\$530,000
1.16.16	-		Tuolumne River Bobcat Flat Phase 2 (Duck Slough)	FWS	-	b1:Area of floodplain hab rest (acres)	unspecified	\$0	\$0	\$212,000	\$0	\$0	\$212,000
								Anticipated Funding					
								State Cash	State In-Kind	Restoration Fund	Water and Related Resources	State or Other Sources*	Total All Sources
								\$0	\$0	\$3,641,185	\$0	\$0	\$3,641,185
										\$0	\$0	\$0	\$0
										\$3,641,185	\$0	\$0	\$3,641,185
								\$0	\$0			\$0	\$0
								\$0	\$0			\$0	\$0
								\$0	\$0			\$0	\$0
								* List other funding source here:					
								None					

Table 2. Three-Year Budget Plan FY 2013 – 2015

Table 2. Three-Year Funding Plan FY 2013 – 2015 (\$ amounts in thousands)						
FY Year	Description of Activities	Funding Needs				
		RF	W&RR	Other	DFG	DWR
2013	1.1 Program Management	\$601				
	1.2 Program Support	\$1,900				
	1.4 Restoration Actions	\$1,800				
	1.5 Research, Evaluations, Studies, and Investigations	\$1,542				
	1.6 Planning	\$531				
	1.13 Modeling	\$400				
	Total	\$6,774				
2014	1.1 Program Management	\$601				
	1.2 Program Support	\$2,000				
	1.4 Restoration Actions	\$2,500				
	1.5 Research, Evaluations, Studies, and Investigations	\$1,542				
	1.6 Planning	\$545				
	1.13 Modeling	\$400				
	Total	\$7,588				
2015	1.1 Program Management	\$631				
	1.2 Program Support	\$2,100				
	1.4 Restoration Actions	\$3,000				
	1.5 Research, Evaluations, Studies, and Investigations	\$2,000				
	1.6 Planning	\$572				
	1.13 Modeling	\$400				
	Total	\$8,703				

Note: The FY 2013 – 2015 Budget Plan provides estimates of capability only. The amounts are displayed are those that might be reasonably appropriated each year. These figures do not reflect the future Congressional Appropriations process. All of these estimates will be adjusted pending appropriations and annual Restoration Fund collections are realized.

Table 3. FY 2012 CVPIA Monitoring Projects (supplement to FY 2012 Annual Work Plan)

Project Description:	San Joaquin River Sturgeon Acoustic Study – implant acoustic transmitters in <i>Acipenser spp.</i> in the San Joaquin River system to evaluate distribution and habitat use.
FY 2012 Project Complete?	No
CVPIA annual work plan subtask number:	FY12 AFRP AWP 1.5.1
Scope of the monitoring effort:	Monitor <i>Acipenser spp.</i> distribution and habitat use of the San Joaquin River system, about which very little is known.
Product/deliverable:	Technical report analyzing spatial and temporal distribution and habitat use of <i>Acipenser spp.</i> throughout the San Joaquin River system.
Cost:	\$118,468
Questions posed:	1) Are white sturgeon or green sturgeon present in the San Joaquin River or its tributaries during their life cycle? 2) What areas and habitat types do white sturgeon or green sturgeon use and how do they use them (e.g., spawning, holding, rearing)? 3) What is the timing and duration of movements of white sturgeon and green sturgeon? 4) How do movements relate to flows, temperature, and other parameters? 5) What factors inhibit accessibility of white sturgeon and green sturgeon to suitable habitat (e.g., flow regime, thermal or physical barriers)?
Objectives:	1) Identify sturgeon holding and spawning habitat 2) Characterize distribution and evaluate migratory pathways in the San Joaquin River and Delta.
Results – expected or actual:	Plan to tag up to 20 white sturgeon and green sturgeon and characterize distribution, movements, and habitat use.
Data collection methods:	Side scan sonar and DIDSON equipment will be used to identify sampling locations, along with local knowledge and expertise. Trammel, gill, and hoop nets will be used, along with angling and trot lines, to

	capture sturgeon. VEMCO acoustic transmitters will be implanted and sturgeon will be tracked using VEMCO stationary and mobile tracking receivers and hydrophones.
Data management:	Electronic database operated by the California Fish Tracking Consortium.
Assessment:	AFS methods for interpreting acoustic data.
Use of information in future decision making:	To identify habitat restoration actions that would benefit white sturgeon and green sturgeon and inform discussion regarding the timing and duration of flows.
NMFS OCAP BO RPA	None

Project Description:	San Joaquin River System and Delta Contaminants, Age and Growth, and Microchemistry Project
FY 2012 Project Complete?	No
CVPIA annual work plan subtask number:	FY12 AFRP AWP 1.5.2
Scope of the monitoring effort:	Suisun and San Pablo bays, Sacramento-San Joaquin Delta, lower Sacramento and San Joaquin rivers.
Product/deliverable:	Digital database with raw data files and four final reports that describe methods, results, discussion, and management implications.
Cost:	\$212,000
Questions posed:	1) How are ambient levels of trace elements and organic and inorganic contaminants affecting the health of adult white sturgeon and green sturgeon, the viability of their gametes, and development of their offspring? 2) Are contaminant issues prevalent throughout the system, or localized? 3) Does removing the anterior pectoral fin ray affect growth and survival of adult white sturgeon? 4) What are current characteristics of age and growth of adult white sturgeon? 5) Have age and growth characteristics of white sturgeon changed since the mid-1970s? 6) Can microchemistry technology be used to identify basin of origin, rearing areas, marine

	migrations, and spawning periodicity of white sturgeon?
Objectives:	Identify the effects of contaminants on sturgeon populations, assess effects of fin ray removal on growth and survival, assess current age-and-growth characteristics, and identify spawning and rearing locations, the frequency and spatial and temporal aspects of marine migrations, and spawning periodicity of white sturgeon.
Results – expected or actual:	The proposed activities will produce digital files of raw data and final reports documenting the results of the monitoring activities.
Data collection methods:	Tissue samples will be collected from angler-harvested adult white sturgeon for the contaminants, microchemistry, and age-and-growth components. Farmed white sturgeon will be used to assess effects of fin ray removal and to validate microchemistry results. Depending upon the results of the fin-ray-removal-effects project, fin ray samples may be obtained from CDFG from sturgeon captured during their fall trammel netting efforts.
Data management:	Digital files with raw data will be archived by the AFRP in a database. Final reports documenting the results of the project will be available on the AFRP website.
Assessment:	Effects of contaminants on all life stages of white sturgeon and green sturgeon, effects of fin ray removal on growth and survival of adult white sturgeon, and population dynamics characteristics of white sturgeon will be evaluated. Environmental characteristics of sturgeon spawning habitat and juvenile rearing habitat will be described.
Use of information in future decision making:	Effects of contaminants on sturgeon and habitat use information will assist AFRP with focusing future restoration actions for these species in the San Joaquin River and the Sacramento-San Joaquin Delta. Green sturgeon is listed as threatened under the ESA and distribution data will assist AFRP with recovery and doubling efforts.
NMFS OCAP BO RPA	None
Project Description:	Identify specific areas and sources of mortality for juvenile Chinook salmon and steelhead in the lower Stanislaus River using radio and hydro acoustic

	telemetry.
FY 2012 Project Complete?	No. Year one of multi-year effort. Additional years will allow comparison of survival differences among different water year types.
CVPIA annual work plan subtask number:	FY12 AFRP AWP 1.5.3
Scope of the monitoring effort:	Lower Stanislaus River between Oakdale and Caswell State Park.
Product/deliverable:	Final Report documenting geographic scope of mortality.
Cost:	\$212,000
Questions posed:	1. Ho: The survival probability of salmonid smolts is the same in all river segments, and sub-reaches of the Stanislaus and is constant throughout the migration period. 2. Ho: The location of salmonid mortalities is randomly distributed within the 30 mi study reach, 10 mi segments, and 3.3 mi sub-reaches. 3. Ho: Areas of low salmonid survival are not associated with the biotic and abiotic characteristics of those areas relative to areas of high survival. 4. Ho: The location of salmonid mortalities is unrelated to the habitat type in which the mortality is detected.
Objectives:	Objective 1: Use radio telemetry technology to estimate reach-specific survival of juvenile salmonids in the lower Stanislaus in 3.3- 10- and 30-mile increments and determine whether there is spatial variation in survival along the 30 mile study reach. Objective 2: Use mobile telemetry surveys to identify the location of salmonid mortality during outmigration at the finest resolution possible (sub-meter scale) to identify problem areas that could be targeted for future actions. Objective 3: Associate biotic and abiotic characteristics with areas of greater salmonid mortality to explore whether reach specific differences in these characteristics contribute to differences in survival along the Stanislaus River. Objective 4: Track experimental fish using mobile radio telemetry surveys and monitor their movement

	and behavior during their outmigration in relation to potential sources of mortality (e.g., predator pools, agricultural return drain, etc.).
Results – expected or actual:	Identification of habitat segments with elevated mortality rates (or lack thereof).
Data collection methods:	Radio-telemetry (fixed and mobile) and hydro-acoustic (fixed)
Data management:	MS-Access database with GPS data included
Assessment:	Monitoring will assess geographic scope of mortality of juvenile Chinook salmon and steelhead through a portion of the rearing and migratory corridor.
Use of information in future decision making:	The results of this study will assist with the identification of future restoration actions (i.e. mine pit isolation projects) or other solutions that are necessary for the recovery of the Stanislaus salmonid populations.
NMFS OCAP BO RPA	III.2.2, III.2.3, IV.2.2
Project Description:	San Joaquin River and Delta Sturgeon Habitat Assessment
FY 2012 Project Complete?	No
CVPIA annual work plan subtask number:	FY12 AFRP AWP 1.5.4 and 1.5.5
Scope of the monitoring effort:	San Joaquin River system and Delta
Product/deliverable:	Digital database with raw data files and final reports that provide analysis of the data.
Cost:	\$199,163
Questions posed:	1) Are white sturgeon or green sturgeon spawning in the San Joaquin River system? 2) What are the spatial and temporal distributions of sturgeon in the San Joaquin River system? 3) Are there specific habitat characteristics that would help identify additional spawning locations?
Objectives:	To document sturgeon spawning activity in the San Joaquin River system and identify and evaluate similar habitat throughout the system for spawning activity. Integration of the bathymetric, flow, and substrate data

	will allow for qualitative and quantitative estimates of various habitat types within the study reaches.
Results – expected or actual:	The proposed activities will produce digital files of raw data and final reports documenting the results of the monitoring activities.
Data collection methods:	Egg collection mats will be used to assess spawning activity. Collected eggs will be identified to species and be subject to genetic testing. Multibeam sonar will be used, along with RTK-GPS for positioning, to map the detailed bathymetry of the river bed and potentially substrate type. Measurements of water flow characteristics (e.g., flow, velocity) will be collected using an acoustic Doppler current profiler. Further, underwater video and photography will be used, along with physical grab samples, to characterize the substrate types of the river.
Data management:	Digital files with raw data will be archived by the AFRP in a database. A final report documenting the results of the project will be available on the AFRP website.
Assessment:	Sturgeon spawning habitat in the San Joaquin River will be evaluated. Environmental characteristics of sturgeon spawning habitat will be described.
Use of information in future decision making:	Identifying sturgeon spawning habitat will help AFRP focus future restoration actions for these species in the San Joaquin River. Green sturgeon is listed as threatened under the ESA and identifying spawning locations will assist AFRP and other agencies with recovery and doubling efforts.
NMFS OCAP BO RPA	None

Project Description:	Mill and Deer Creeks: Wild Juvenile Chinook Acoustic Tagging Investigations
FY 2012 Project Complete?	No
CVPIA annual work plan subtask number:	FY12 AFRP AWP 1.5.6
Scope of the monitoring effort:	Recent advances in acoustic telemetry technology have resulted in acoustic transmitters which are small enough to be implanted in previously untaggable juvenile Chinook salmon (fall, winter and spring runs). This technology will be used to release acoustically-

	tagged hatchery and wild fall and spring run Chinook smolts over a period of 3 years.
Product/deliverable:	Fish movement and survival data (specific to each watershed), nursery/holding area data, reaction to environmental changes (e.g. flow), data to compare behavior and survival of hatchery-raised vs. wild salmon.
Cost:	\$212,000
Questions posed:	How do native migratory fish navigate through the San Francisco estuary? What factors affect their migratory behavior? What are the management implications? How do habitat attributes such as geometry, water flow, temperature, turbidity, contaminants, presence of predators, and food quantity and quality affect abundance and distribution of native fishes in the estuary? How do connectivity between different habitat types and geographical extent and arrangement of habitats affect abundance and distribution of native fish in the San Francisco Estuary?
Objectives:	Goal: Determine juvenile migratory salmon needs in order to improve the fishery. Objective: Collecting fish movement and behavior data via acoustic tagging.
Results – expected or actual:	Expected; more accurate and specific information to make effective management decisions.
Data collection methods:	Acoustic tagging and tracking; mapping, habitat data collection.
Data management:	Digital files with raw data will be archived by the AFRP in an Excel and relational databases. All drawings, maps, etc. will be delivered and maintained by AFRP. A final report will be available on the AFRP website.
Assessment:	See above
Use of information in future decision making:	The data will enable researchers to evaluate effects of natural and anthropogenic changes in flow and related water project operations on their survival and movement patterns within the Sacramento River and Delta, and then ultimately allow managers to more effectively manage flows for the benefit of juvenile salmonids.
NMFS OCAP BO RPA	Monitoring and reporting section 11.2.1.3.8a

Project Description:	Lower Antelope Creek Geomorphology Study a) gaging distributaries to assist in determining fish passage issues in each distributary and feasibility of combining flows into one channel; b) detailed topography/hydraulic modeling of controlling flow splits that are susceptible to geomorphic and hydraulic changes from erosion, deposition, vegetation patterns, and human manipulation, and preliminary water quality work looking at temperature profiles and agriculture irrigation return effects. (Ongoing project but funded with NFPP funds)
FY 2012 Project Complete?	Ongoing project but funded with NFPP funds in FY09
CVPIA annual work plan subtask number:	FY12 AFRP AWP 1.5.7
Scope of the monitoring effort:	Lower Antelope Creek and its distributaries; New Creek, Craig Creek, Butler Slough, and Antelope Creek. a) Place stream gages in distributaries and mainstem to measure discharge. This information will allow the consultant and TAC team to make more informed recommendations in regards to addressing fish passage in the Lower Antelope Creek watershed. b) Map detailed topography at controlling flow splits and hydraulic modeling to assess sensitivity of hydraulic controls on various flow paths and fish passage conditions. c) Preliminary water quality data gathering looking at temperature profile and agriculture water return effects. 2 years of monitoring
Product/deliverable:	Report on discharge relationships of the distributaries and their impact on fish passage. Detailed topography at controlling flow splits and how these affect flow through the lower Antelope Creek watershed. Determine water quality parameters that may affect migration/emigration of salmonids.
Cost:	\$164,300 (This does not include the detailed topography which may be done by the USFWS,

	hydraulic modeling contract (\$70,000)).
Questions posed:	What are the potential restoration actions to improve passage of adult and juvenile salmonids in the lower Antelope Creek watershed? What flows are fish able to migrate upstream? What is the potential for combining flows into one channel, as appropriate, for passage during low flow years? What is the water quality during periods of salmonid migration/emigration?
Objectives:	Fill data gaps that will assist in determining potential restoration actions in Lower Antelope Creek to facilitate passage for salmonids, particularly in low flow years. Determine water quality parameters that may affect salmonid migration/emigration or that need further study.
Results – expected or actual:	Knowledge of how water/discharge moves through lower Antelope Creek that will fill data gaps related to determining potential restoration actions in providing fish passage during low flow years. Determine water quality parameters that may affect salmonid migration/emigration or that need further study.
Data collection methods:	Set up separate stream gages in each distributary and mainstem; use total-station and survey techniques to map the controlling flow splits and hydraulic modeling of results; use temperature and water quality monitoring devices throughout the lower Antelope distributaries.
Data management:	GIS layers, electronic data files
Assessment:	Stream gages, total station surveying, hydraulic modeling, water temperature and other quality parameter measurements.
Use of information in future decision making:	Determine restoration efforts to improve fish passage.
NMFS OCAP BO RPA	N/A

Project Description:	Honolulu Bar post project invertebrate monitoring
FY 2012 Project Complete?	Expected construction summer 2012

CVPIA annual work plan subtask number:	1.12.1
Scope of the monitoring effort:	Aquatic macro-invertebrates will be sampled in restored aquatic floodplain and side-channel habitats.
Product/deliverable:	Data and report documenting macro-invertebrate densities.
Cost:	\$10,000
Questions posed:	What are the types and densities of aquatic macro-invertebrates in restored habitats?
Objectives:	Document food production value in restored aquatic habitat.
Results – expected or actual:	We expect to find quick colonization of newly restored habitat.
Data collection methods:	Appropriate methods as determined after site construction.
Data management:	Data will be entered into MS Excel spreadsheets.
Assessment:	Value of restored habitat will be assessed as it relates to food production for juvenile salmonids.
Use of information in future decision making:	Likely to support continued restoration of floodplain and side-channel habitats.
NMFS OCAP BO RPA	III.2.2