

Draft CVPIA Fiscal Year 2014 Annual Work Plan

April 29, 2013

Program Title:

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

Responsible Entities:

Staff Name	Agency	Role
Douglas Threlhoff	U.S. Fish and Wildlife Service	CAMP Lead
TBD	U.S. Bureau of Reclamation	CAMP Co-Lead
Jason Kindopp	California Department of Water Resources	State Partner
Doug Killam	California Department of Fish and Game	State Partner

Program Goals and Objectives for FY 2014

Section 3406(b)(16) of the Central Valley Project Improvement Act (CVPIA) authorizes and directs the Secretary of the Interior (Secretary) to 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 and assess the biological results and effectiveness of actions implemented pursuant to CVPIA Section 3406(b). The Comprehensive Assessment and Monitoring Program (CAMP) was developed to address this requirement.

To address its mandate in the CVPIA, the CAMP focuses on two program objectives identified in the 1997 CAMP Implementation Plan, and a third objective identified in the 2008 Independent Review of the CVPIA Fisheries Program:

CAMP Program Objective #1 assesses overall (cumulative) effectiveness of restoration actions implemented pursuant to CVPIA Section 3406(b) in meeting fish production targets developed by the Anadromous Fish Restoration Program (AFRP).

The AFRP fish production targets pertain to the adult life stage of fall-, late-fall-, winter-, and spring-run Chinook salmon; steelhead; striped bass; American shad; white sturgeon; and green sturgeon. The targets involve one broader area and 22 Central Valley watersheds. The broader area includes San Pablo Bay, Suisun Bay, and Sacramento-San Joaquin River Delta. The 22 watersheds are the American River, Antelope Creek, Battle Creek, Bear River, Big Chico Creek, Butte Creek, Calaveras River, Clear Creek, Cosumnes River, Cottonwood Creek, Cow Creek, Deer Creek, Feather River, Merced River, Mill Creek, seven "Miscellaneous Creeks" upstream from the Red Bluff Diversion Dam on the Sacramento River mainstem, Mokelumne River, Paynes Creek, Sacramento River mainstem, Stanislaus River, Tuolumne River, and Yuba River. Each year, the CAMP produces one annual report relating to Program Objective #1. That report uses monitoring data to develop annual fish production estimates, and the fish production estimates are then compared to the AFRP fish production targets to determine if the targets are being met.

As funding is available, the CAMP provides financial support to entities that collect adult Chinook salmon monitoring data that can be used to determine if the AFRP's Chinook salmon production targets are being met. On rare occasions, the CAMP has also provided funds to collect monitoring data involving non-salmon species so that data could be used to determine if the AFRP's non-salmon fish production targets were met.

CAMP Program Objective #2 assesses the relative effectiveness of categories of CVPIA Section 3406(b) restoration actions (e.g., water management modifications, structural modifications, habitat restoration, and fish screens) toward meeting AFRP fish production targets.

Conceptually, the CAMP would implement Program Objective #2 by collecting, compiling, and summarizing rotary screw trap (RST) data for the juvenile life stage of Chinook salmon with the expectation these data can be used to assess the effectiveness of the four categories of habitat restoration actions. The CAMP's Implementation Plan describes a general process where juvenile salmon production estimates are used in combination with monitoring data from habitat restoration activities and chronologies of habitat restoration activities to assess the relative effectiveness of the four categories of habitat restoration activities.

The CAMP Implementation Plan recommends that juvenile Chinook salmon production be monitored in the following 14 watersheds. These are the American River, Battle Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Feather River, Merced River, Mill Creek, Mokelumne River, Sacramento River mainstem, Stanislaus River, Tuolumne River, and Yuba River.

The CAMP provides a limited amount of funding to monitor juvenile Chinook salmon with rotary screw traps and tends to focus those funds on the collection of data in one of four watersheds identified in legislation authorizing the Central Valley Project (CVP). Those watersheds are the American River, Clear Creek, Sacramento River, and Stanislaus River.

Thus far, the CAMP has been hampered in addressing Program Objective #2 because there is no unified standardized effort to collect, analyze, report, and store RST data where RSTs have been deployed since 1995. To address these issues, the CAMP has initiated an effort to develop the RST "platform" described in greater detail below. The data summaries from the platform are expected to provide the foundation that is necessary (in combination with other data) to conduct the analyses pertaining to CAMP Program Objective #2.

CAMP Program Objective #3 is to establish a data management program to manage CVPIA data as a resource available to all interested parties, provide training in data management, ensure compliance with relevant federal laws and regulations, and to ensure the effective and economical management of the resource. The documentation (through metadata) of data sets and the distribution and sharing of data via easily accessible databases will enable more collaboration and enhance our ability to determine which restoration activities result in the greatest improvement in anadromous fish populations. Results that suggest positive correlation between restoration activities and anadromous fish populations will be continued and possibly expanded; those that suggest negative or no correlation will be reassessed to determine if those activities are the best use of scarce resources. Actions with marginal results could be modified or refined and subjected to future analysis.

The CAMP performance measure is to produce one annual report per year.

Status of the Program

CAMP Program Objective #1: The CAMP has produced 10 annual reports addressing CAMP Program Objective #1. Those reports were prepared in 1997, 1998, 1999, 2000, 2007, 2008, 2009, 2010, 2011, and 2012. To produce the reports, the CAMP: (a) acquires and compiles monitoring data collected by other entities and that pertain to the adult life stage of the nine anadromous fish species identified in the CVPIA, (b) collects a limited amount of monitoring data using its own funding, (c) uses the monitoring data to develop fish production estimates for the nine aforementioned anadromous fish species, (d) compares the fish production estimates with fish production targets developed by the AFRP to determine if the fish production estimates are greater, or less, than the AFRP fish production targets, and (e) produces an annual report with its findings. If fish production targets have not been met, it indicates previous habitat restoration activities were insufficient to accomplish the restoration goals outlined in the CVPIA.

The CAMP annual reports addressing CAMP Program Objective #1 demonstrate the majority of the AFRP fish production targets have not been met on a regular basis. There are multiple causes for this lack of success in achieving the AFRP fish production targets. In any one year, the following factors, either individually or collectively, may lead to depressed fish production estimates: insufficient breeding and rearing habitat, water quality issues, ocean conditions, and over harvest. The degree to which these and other causes affecting fish production have not been quantified. Substantial increases in data analysis efforts will be required to identify the most important factors that promote measurable increases in anadromous fish production and thereby lead to the achievement of the AFRP fish production targets.

CAMP Program Objective #2: To evaluate the relative effectiveness of restoration actions, i.e., CAMP Program Objective #2, the CAMP initiated an effort in FY 2010 to acquire and synthesize RST data collected by several entities in the Central Valley. In FY 2011, the CAMP and Pacific States Marine Fisheries Commission (PSMFC) began the process of developing a database and computer programming code, i.e., a RST platform, that will standardize the storage, analysis, and reporting of historical and future juvenile salmon production estimates from seven watersheds in the Central Valley. Those “core” watersheds are the American River, Battle Creek, Clear Creek, Feather River, Mokelumne River, Sacramento River at the Red Bluff Diversion Dam, and Stanislaus River. Those watersheds were chosen because they have long-term data sets spanning many years, and the trap efficiency tests that are required to develop juvenile salmon production estimates were conducted in those watersheds. The platform has been designed, however, to accommodate all of the historical and future RST data collected from every watershed in the Central Valley. As funding is available, the CAMP will pursue importing additional RST data into the platform that does not involve the seven core watersheds.

By comparing trends in standardized juvenile salmon production estimates with chronologies of completed restoration projects, it should be possible to determine if there was a biological response (i.e., increased juvenile salmon production) following one or more habitat restoration projects in a watershed. If the results derived from the RST platform suggest increases in juvenile salmon production did not occur after habitat restoration activities occurred, it may be necessary to reassess the way in which restoration projects were conducted and/or how

juvenile salmon monitoring activities were conducted, and whether the design, magnitude, or geographic scope of future restoration activities needs to be substantially changed to elicit an increase in juvenile salmon production.

The development of the RST platform has progressed to the point where a final database structure for storing RST data has been created, a user interface with various forms for entering new RST data has been created, the migration of historical data from three watersheds to the CAMP database is nearly complete, the process of migrating historical data from three other watersheds is under way, and computer programming code is being developed that will produce tabular and graphical summaries of juvenile salmon production estimates using the raw data in the database.

In addition to being used to evaluate the relative effectiveness of habitat restoration actions, the RST data will also provide a rich source of information for documenting and evaluating changes in the abundance, demography, and ecology of juvenile Chinook salmon in the Central Valley.

CAMP Program Objective #3: The CAMP currently has three ongoing, data management programs. These are the Data Acquisition and Management Plan, the Accomplishments Database, and the GIS Network Access Tool.

The purpose of the first data management program, i.e., the Data Acquisition and Management Plan (DAMP), is to provide guidelines for all of the CVPIA Program's current, and future, data management efforts throughout the data lifecycle. The data lifecycle is a formal process consisting of phases that, when followed consistently, will result in accurate, standardized, shareable data for our work and our customers.

A secondary purpose of the DAMP is to implement procedures in which the pertinent laws and regulations are followed with more ease and consistency. This will help to insure that data are legally defensible in critical decisions.

There are two objectives of the CVPIA DAMP. The first is to provide instructions to all data stewards on properly documenting their data according to the standards of the Federal Geographic Data Committee, pertinent Federal laws and regulations, and the Bureau of Reclamation regulations. The second is to aid in the restoration of the Central Valley ecosystems by providing accurate data for proper decision-making. Preliminary instruction on data management has been provided in previous fiscal years. Currently a data documentation form has been created that follows the BOR data life cycle. The documentation of data sets that answer specific CVPIA Program management questions is emphasized.

The second data management program is the CVPIA Accomplishments Database (AD). The CVPIA Program requires the ability to view various accomplishments data sets from within a single application, i.e., the AD. The purpose is to store past and current program and project data, to preserve institutional knowledge, to ensure consistent reporting of data, to provide multiple users (internal and external to the Department of Interior) access to the data, and to create standard and custom reports.

The objective of the AD is to identify the available data sets managed by program partners such as agencies within the Department of Interior, the State of California, Tribes, and other entities;

and to enter or link interagency data sets and databases to a centralized database.

The AD is currently in the initial phase of development. Many program partners have an existing and similar database, thus it will be necessary during this project to determine whether to use and expand an existing database or create a new one. The results of this phase will determine the appropriate approach (whether to pursue a contract or develop the AD in-house). The final result will be an a browser based AD application that allows users to easily access up-to-date CVPIA information, including historical and program partners' data, and create reports from their desktop.

The third data management program in the CAMP is the CVPIA GIS Network Access Tool (GNAT). The CVPIA has a document database that was created in 2010 and was based on Microsoft Access. Documents pertinent to the CVPIA Program are stored within this database. This method of data storage is no longer efficient. A central database storage that allows for remote access is required. The CVPIA database will need to have a link to spatial data that portrays the location of the CVPIA project locations. A web based Geographic Information System that allows the user to see spatial relationships and locations of CVPIA projects will be of benefit. The interface will be designed to be intuitive for a wide audience ranging from DOI staff to public users. A cloud based service is recommended for hosting this service. The GNAT is being developed using both in-house and contract personnel. Many documents from the previous Access database have been assigned geographic coordinates and a GIS database is being developed. A web access tool is in the beginning stages of development, with implementation in late 2013 or early 2014.

Adaptive Management

The CAMP strives to collect and report data that can be used to enhance the success of future restoration projects. Because the production of juvenile salmon is a primary indicator that can be used to determine restoration project success, the CAMP has focused on developing the abovementioned RST platform. In contrast, monitoring data for adult salmon provide less of a basis for inferring the effectiveness of habitat restoration activities because adult salmon spend a substantial portion of their life in the ocean where their survival and growth are affected by many factors that are beyond the influence of CVPIA managers. The adult data is important, however, because it indicates if the AFRP fish production targets were met.

As the juvenile salmon production estimates from the CAMP RST become available, they will be: (1) used to determine if juvenile salmon production levels are increasing over time, which may indicate that CVPIA habitat restoration activities are collectively producing a biological response, (2) used to determine if the number of juveniles produced per adult female is stable, increasing, or declining, thereby providing a more refined understanding of whether habitat restoration activities are producing a biological response, and (3) integrated with chronologies of habitat restoration activities to identify periods when substantial changes in juvenile salmon coincided with the different habitat restoration activities that were conducted. If a positive correlation between juvenile salmon production and habitat restoration activities is found during these three types of analyses, it would suggest that habitat restoration activities are creating a measurable, beneficial response. If a negative or neutral correlation is found, CVPIA staff may need to revisit basic assumptions about the nature, geographic scope, or intensity of the future habitat restoration activities that are needed if they are to be successful in meeting the restoration goals identified in the CVPIA.

Due to advancement in ecosystem restoration approaches and ecological changes in the Sacramento and San Joaquin River systems since the CVPIA was enacted, an enhanced process for decision making, implementation, and performance measurement is needed to ensure that implementation of the CVPIA continues to meet its intended purposes. The CAMP, in conjunction with a variety of partners, began developing a Structured Decision Making framework/process (SDM) in FY 2013. The SDM is in an early stage of development. A general description of the framework/process and its development is provided below, subject to revision as its development proceeds.

The SDM will result in more integrated operations and additional information which will better inform restoration decisions while meeting the water and power needs of the public. It will be implemented in close coordination with other ongoing efforts including, but not limited to, the Bay Delta Conservation Plan, the San Joaquin River Restoration Program, and consultations involving the Federal Endangered Species Act.

To coordinate the implementation of activities relating to fish protection and restoration efforts, the Department of the Interior will develop an overarching strategy to address the species' needs using insights gained through the Bay Delta Conservation Plan planning process, Interagency Ecological Program research investigations, and other recovery efforts in the Central Valley. The SDM will facilitate future decisions using a scientific framework that connects restoration actions to environmental and population responses across watersheds.

The recommendations in the Independent Review of the CVPIA Fisheries Program in the "Listen to the River" report (CVPIA 2008) and the CVPIA's goals in light of the current regulatory and ecosystem conditions will guide the development of the SDM. Specifically, the initial steps include developing a structured decision making process and producing an updated CVPIA Implementation Plan. The SDM recommended for the CVPIA Fisheries Program by the independent panel of experts (CVPIA 2008) will require: (1) revisiting Fisheries Program objectives and performance measures with State and Federal agencies as well as other stakeholders, (2) developing a system-wide conceptual/quantitative model from the Bay-Delta to tributary headwaters to help guide Fisheries Program decisions from a holistic scientific understanding, (3) reassessing monitoring and evaluation efforts given revised objectives and system-wide model, and (4) integrating independent scientific reviews into the organizational structure of the Fisheries Program. The results from the structured decision process will provide the strategic approach and foundational pieces for the CVPIA Implementation Plan that will serve as the Program's longer-term guiding document. The results from these initial steps will also provide guidance on how the organizational structure of the CVPIA Fisheries Program could be realigned to best support modifications to the structured decision making program.

Table 1. FY2014 Proposed Activities and Costs

CVPIA Section 3406 (b)(16), Comprehensive Assessment & Monitoring Program

	3406 (b)(16) Requested Funding for Fiscal Year 2014				
	Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources
Total Funding	\$3,680,000	\$0	\$0	\$548,000	\$4,228,000
Reclamation	\$2,549,962	\$0			\$2,549,962
Service	\$1,130,038	\$0			\$1,130,038
CA DFG			\$0	\$0	\$0
CA DWR			\$0	\$548,000	\$548,000

1.1 Program Management												
AWP Activity Number	Activity Name	Activity Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(16) Requested Funding for Fiscal Year 2014					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
1.1.1	CAMP Program Manager	Program management activities in FY 2014 will include: (1) developing an annual report assessing and reporting overall (cumulative) effectiveness of restoration actions implemented pursuant to CVPIA Section 3406(b); (2) participating in planning exercises relating to the CVPIA; (3) managing contracts and/or cooperative agreements; (4) acquiring, refining, and synthesizing data that address CAMP Program Objectives #1 and #2; and (5) identifying new CVPIA data collection activities necessary to ensure program success. CAMP Program Objective # 1 & 2.	FWS	1.00			\$223,038					\$223,038
							Sub-Total for Program Management, FY2014					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
Subtotal Funding							\$223,038	\$0	\$0	\$0	\$223,038	
Reclamation							\$0	\$0			\$0	
Service							\$223,038	\$0			\$223,038	
CA DFG									\$0	\$0	\$0	
CA DWR									\$0	\$0	\$0	

1.2		Program Support											
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(16) Requested Funding for Fiscal Year 2014						
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources		
1.2.1	CAMP Co-Lead Manager	FY 2014 activities will include: (1) developing the CVPIA Data Management plan; (2) developing the CVPIA Accomplishments Database; (3) creating and maintaining Annual Accomplishment Tables; (4) maintaining and updating the Annual Work Plan tables; (5) assisting in the development of the Annual Accomplishments Report; (6) assessing current data being collected by all CVPIA programs; (7) coordinating data management activities with other Federal and state agencies and other organizations; and (8) assisting in the planning and development of the Structured Decision Making project. CAMP Program Objective # 3. (CA# H3002142065)	BOR	1.00			\$224,000					\$224,000	
							Sub-Total for Program Support, FY2014						
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources		
							<i>Subtotal Funding</i>	\$224,000	\$0	\$0	\$0	\$224,000	
							<i>Reclamation</i>	\$224,000	\$0			\$224,000	
							<i>Service</i>	\$0	\$0			\$0	
							<i>CA DFG</i>			\$0	\$0	\$0	
							<i>CA DWR</i>			\$0	\$0	\$0	

1.3		Technical Support										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(16) Requested Funding for Fiscal Year 2014					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
1.3.1	RTS Platform Maintenance	Maintain and refine the CAMP's rotary screw trap platform that stores rotary screw trap data and produces juvenile salmon production estimates. The production estimates will be used to assess the effects of habitat restoration activities and formulate adaptive management strategies designed to improve the efficacy of future restoration activities. Data from the following locations is being migrated into the database: American River, Battle Creek, Clear Creek, Feather River, Mokelumne River, Red Bluff Diversion Dam on the Sacramento River, and Stanislaus River. This project does not require FY2014 funding and will be paid for with carryover funds from the FWS. CAMP Program Objective #2. (81420-J-J520).	FWS	0.00			\$0				\$0	
1.3.2	Accomplishment Database IT support	BOR IT support for development and contract oversight of the Accomplishment database. CAMP Program Objective #3. (CA# H30-0214-2050-000-0-0-2)	BOR	0.15			\$28,294				\$28,294	
							Sub-Total for Technical Support, FY2014					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$28,294	\$0	\$0	\$0	\$28,294
							<i>Reclamation Service</i>	\$28,294	\$0			\$28,294
							<i>CA DFG</i>	\$0	\$0			\$0
							<i>CA DWR</i>			\$0	\$0	\$0

4.1		Monitoring (Programmatic)			3406 (b)(16) Requested Funding for Fiscal Year 2014							
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(16) Requested Funding for Fiscal Year 2014					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
4.1.1	Stanislaus River Rotary Screw Trap	Quantify production of juvenile Chinook salmon from the Stanislaus River (Caswell State Park) using a rotary screw trap (RST). The work to be done in 2015 will be the 20th year data have been collected at Caswell State Park. The operation of the Stanislaus River RST is identified as a recommended monitoring element in the CAMP Implementation Plan (i.e., CAMP monitoring element # 78), and supports a CAMP and CVPIA-related need to accurately quantify production of juvenile Chinook salmon in a Central Valley Project watershed. CAMP Program Objective #2. Cost estimate includes a 6% FWS contract administration charge of \$10,986. (FRFR4833-08C3AMO).	FWS	0.00	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$195,000					\$195,000
4.1.2	American River Rotary Screw Trap	Monitor the abundance of juvenile Chinook salmon and steelhead in the American River using a rotary screw trap (RST). The work to be done in 2015 and 2016 will be the second and third year data have been collected on the American River with CVPIA-CAMP funds. The operation of the American River RST is identified as a recommended monitoring element in the CAMP Implementation Plan (i.e., CAMP monitoring element # 76), and supports a CAMP and CVPIA-related need to accurately quantify production of juvenile Chinook salmon in a Central Valley Project watershed. CAMP Program Objective #2. Restoration Fund cost includes a 6% FWS contract administration charge of \$12,000. (FRFR4833-08C3AMO).	FWS	0.00	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$212,000					\$212,000
4.1.3	Feather River Constant Fractional Marking Program	Constant Fractional Marking program - Feather River: Mark 25% of the juvenile fall-run Chinook salmon at the Feather River Fish Hatchery, and mark 100% of the juvenile spring-run Chinook salmon produced at that hatchery. Data from the marked salmon will be used to assess the relative proportion of wild- vs. hatchery-origin adult salmon that return to spawn in Central Valley rivers and streams. CAMP Program Objective #1.	CDWR	0.00	Write 1 Annual Report	Contribute to the CAMP Annual Report				\$548,000		\$548,000
4.1.4	Battle Creek Rotary Screw Trap	Quantify production of juvenile Chinook salmon from Battle Creek using a rotary screw trap (RST). The operation of the Battle Creek RST is identified as a recommended monitoring element in the CAMP Implementation Plan (i.e., CAMP monitoring element # 65), and addresses an OCAP biological opinion monitoring requirement. CAMP Program Objective #2. Restoration Fund cost includes a 22% FWS overhead administrative charge of \$39,199. (IA No. R10PG20172).	BOR	0.73	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$217,376					\$217,376
4.1.5	Winter-run Chinook salmon Carcass Survey	Quantify production (escapement) of adult winter-run Chinook salmon on the Sacramento River mainstem. This activity is identified as a recommended monitoring element in the CAMP Implementation Plan (i.e., CAMP monitoring element # 41), and addresses an OCAP biological opinion monitoring requirement. CAMP Program Objective #1. Restoration Fund cost includes a 22% FWS overhead administrative charge of \$33,948. (IA No. R10PG20172).	BOR	0.63	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$188,260					\$188,260

4.1.6	CWT recovery on Cottonwood Creek / Sacramento River	Collect adult Chinook salmon from Cottonwood Creek and a portion of the Sacramento River mainstem and retrieve coded wire tags (CWTs) with the goal of quantifying the proportion of wild- vs. hatchery-origin salmon in those two watersheds. This project does not require FY2014 funding and will be paid for with carryover funds from the FWS. CAMP Program Objective #1. (81420-J-J520).	FWS	0.00	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$0				\$0	
4.1.7	Red Bluff Diversion Dam Rotary Screw Trap	Quantify production of juvenile Chinook salmon and monitor juvenile green sturgeon abundance in the Sacramento River mainstem at the Red Bluff Diversion Dam using rotary screw traps (RST). The operation of RSTs at this location is identified as a recommended monitoring element in the CAMP Implementation Plan (i.e., CAMP monitoring elements # 58, 59, and 60), and addresses an OCAP biological opinion monitoring requirement. CAMP Program Objective #2. Restoration Fund cost includes a 22% FWS overhead administration charge of \$161,715. (IA No. R10PG20172). There could be as many as 10 FWS staff working on this project.	BOR	0.00	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$896,783				\$896,783	
4.1.8	Nimbus & Coleman Constant Fractional Marking Program	Constant Fractional Marking Program - Nimbus Fish Hatchery and Coleman National Fish Hatchery (CFM-NC): Mark and tag 25% of the juvenile fall-run Chinook salmon at the Nimbus Fish Hatchery and Coleman National Fish Hatchery. Data from the marked salmon will be used to assess the relative proportion of wild- vs. hatchery-origin adult salmon that return to spawn in Central Valley rivers and streams. CAMP Program Objective #1.	BOR	0.00	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$688,092				\$688,092	
4.1.9	Battle Creek Adult Salmonid Escapement Monitoring	Quantify the production (escapement) of adult spring-run Chinook salmon and monitor the abundance of adult steelhead in Battle Creek. This activity is identified as a recommended monitoring element in the CAMP Implementation Plan (i.e., CAMP monitoring element # 65), and addresses an OCAP biological opinion monitoring requirement. CAMP Program Objective #1. Restoration Fund cost includes a 22% FWS overhead administrative charge of \$31,946. (IA No. R10PG20172).	BOR	0.59	Write 1 Annual Report	Contribute to the CAMP Annual Report	\$177,157				\$177,157	
4.1.10	San Joaquin River Delta Chinook Salmon Survival Study	Quantify the survival of juvenile Chinook salmon as they migrate through the lower San Joaquin River and Sacramento River/San Joaquin River Delta.	FWS	0.94	Write 1 Annual Report	Provide data to improve survival of juvenile Chinook salmon as they migrate to the Pacific Ocean.	\$400,000				\$400,000	
							Sub-Total for Monitoring (Programmatic), FY2014					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$2,974,668	\$0	\$0	\$548,000	\$3,522,668
							<i>Reclamation Service</i>	\$2,167,668	\$0		\$2,167,668	
							<i>CA DFG</i>	\$807,000	\$0		\$807,000	
							<i>CA DWR</i>		\$0	\$0	\$0	
									\$0	\$548,000	\$548,000	

4.4		Data Management				3406 (b)(16) Requested Funding for Fiscal Year 2014					
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(16) Requested Funding for Fiscal Year 2014				
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources
4.4.1	CVPIA GIS Network Access Tool (GNAT)	This activity is for continued GIS support of the CVPIA GIS Network Access Tool (GNAT). The activity will cover continued development of the GIS data sets, addition of new documents (2012, 2013, and historical), project locations for accomplishments and proposed projects. (CA# H30-0214-2065-000-00-0-0)	BOR	0.04	Management of CVPIA Data	Updating and maintenance of GNAT	\$10,000				\$10,000
4.4.2	CVPIA GIS Network Access Tool (GNAT)	This activity is for the maintenance and update of the CVPIA GIS Network Access Tool (GNAT) web interface and database. This will allow users to search by keyword and geographic location via GIS. Funds will be used for: continued refinement of the interface; development of a user's manual, documentation of the system. (CA# H30-0214-2065-000-00-0-0)	BOR	0.00	Management of CVPIA Data	Updating and maintenance of GNAT	\$20,000				\$20,000
							Sub-Total for Data Management, FY2014				
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources
							\$30,000	\$0	\$0	\$0	\$30,000
							<i>Reclamation</i>	\$30,000	\$0		\$30,000
							<i>Service</i>	\$0	\$0		\$0
							<i>CA DFG</i>			\$0	\$0
							<i>CA DWR</i>			\$0	\$0

4.5		Adaptive Management										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(16) Requested Funding for Fiscal Year 2014					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
4.5.1	Structured Decision Making (SDM)	<p>The Structured Decision Making (SDM) is an opportunity to revise the way CVPIA is implemented, the CVP is operated, and how mitigation and restoration activities are undertaken. This new science-based decision making process will enhance the manner in which CVPIA is implemented and its performance is measured by focusing on the following steps: (1) revisiting Program objectives and performance measures with State and Federal agencies as well as other stakeholders and reframing these, where appropriate, with explicitly stated hypotheses with measurable criteria; (2) updating/developing a system-wide conceptual/quantitative model from the Bay-Delta to the headwaters to help guide Program decisions; (3) reassessing monitoring and evaluation efforts within the context of revised objectives and a system-wide model; and (4) utilizing scientific reviews into the organizational structure of the Program to evaluate the programs progress.</p> <p>Interagency and other DOI offices & agencies will be working to develop the SDM. This will involve contracting with a facilitator to update the fish restoration plan, hiring consultants, and working with higher level BOR and FWS scientists and managers. (FRFR4833-08C3AMO).</p>	BOR	0.00	0	0	\$100,000				\$100,000	
4.5.2	Structured Decision Making (SDM)	<p>The Structured Decision Making (SDM) process is split 50%/50% between FWS & BOR. This item constitutes FWS funded portion of the program.</p> <p>Interagency and other DOI offices & agencies will be working to develop the SDM. This will involve contracting with a facilitator to update the fish restoration plan, hiring consultants, and working with higher level BOR and FWS scientists and managers. (FRFR4833-08C3AMO).</p>	FWS	0.00	0	0	\$100,000				\$100,000	
							Sub-Total for Adaptive Management, FY2014					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$200,000	\$0	\$0	\$0	\$200,000
							<i>Reclamation</i>	\$100,000	\$0			\$100,000
							<i>Service</i>	\$100,000	\$0			\$100,000
							<i>CA DFG</i>			\$0	\$0	\$0
							<i>CA DWR</i>			\$0	\$0	\$0

Outyear activities are estimates of funding capability only and do not reflect the future Congressional Appropriations process.

Table 2. FY2015 Proposed Activities and Costs

CVPIA Section 3406 (b)(16),

Comprehensive Assessment & Monitoring Program

	3406 (b)(16) Requested Funding For Fiscal Year 2015			
	Restoration Fund	Water and Related Resources	State Cash	Total All Sources
Total	\$2,800,000	\$0	\$564,440	\$3,364,440
US Bureau of Reclamation	\$2,126,181	\$0		\$2,126,181
US Fish and Wildlife Service	\$673,819	\$0		\$673,819
California Dept of Fish and Wildlife			\$0	\$0
California Dept of Water Resources			\$564,440	\$564,440

Task	Project Name	Project Description	Federal Costs(\$)				State Cost Share (\$)		Total Costs (\$)
			BOR Restoration Fund	BOR W&RR Fund	FWS Restoration Fund	FWS W&RR Fund	CA DFW	CA DWR	
Program Mgmt & Support			\$230,720		\$229,729			\$460,449	
Project 1	CAMP RST Platform Maintenance.	Maintain and provide technical support for the CAMP's rotary screw trap platform			\$50,000			\$50,000	
Project 2	Stanislaus River Rotary Screw Trap.	Maintain and provide technical support for the CAMP's rotary screw trap platform.			\$194,090			\$194,090	
Project 3	American River Rotary Screw Trap.	Monitor the abundance of juvenile Chinook salmon and steelhead in the American River using a rotary screw trap.			\$100,000			\$100,000	
Project 4	Constant Fractional Marking Program.	Mark and tag 25% of the fall-run Chinook salmon at the Nimbus Fish Hatchery and Coleman National Fish Hatchery.	\$738,674					\$738,674	
Project 5	Red Bluff Diversion Dam Rotary Screw Trap.	Quantify production of juvenile Chinook salmon and monitor juvenile green sturgeon abundance in the Sacramento River mainstem at the Red Bluff Diversion Dam using rotary screw traps.	\$922,880					\$922,880	

Outyear activities are estimates of funding capability only and do not reflect the future Congressional Appropriations process.

Task	Project Name	Project Description	Federal Costs(\$)				State Cost Share (\$)		Total Costs (\$)
			BOR Restoration Fund	BOR W&RR Fund	FWS Restoration Fund	FWS W&RR Fund	CA DFW	CA DWR	
Project 6	Winter-run Chinook salmon Carcass Survey.	Quantify production (escapement) of adult winter-run Chinook salmon on the Sacramento River mainstem.	\$193,907						\$193,907
Project 7	Constant Fractional Marking Program.	Mark 25% of the fall-run Chinook salmon at the Feather River Fish Hatchery, and mark 100% of the spring-run Chinook salmon produced at that hatchery.						\$564,440	\$564,440
Project 8	CVPIA Accomplishment Database	Development and maintenance of the CVPIA Accomplishment Database	\$20,000						\$20,000
Project 9	CVPIA GIS Network Access Tool (GNAT)	Development and maintenance of the CVPIA GIS Network Access Tool (GNAT)	\$20,000						\$20,000
Project 10	Structured Decision Making	Interagency and other DOI offices & agencies will be working to develop the SDM. This will involve contracting with a facilitator to update the fish restoration plan, hiring consultants, and working with higher level BOR and FWS scientists and managers.			\$100,000				\$100,000

Outyear activities are estimates of funding capability only and do not reflect the future Congressional Appropriations process.

Table 2. FY2016 Proposed Activities and Costs
 CVPIA Section 3406 (b)(16),
 Comprehensive Assessment & Monitoring Program

			3406 (b)(16) Requested Funding For Fiscal Year 2016						
			Restoration Fund	Water and Related Resources	State Cash	Total All Sources			
Total			\$2,000,000	\$0	\$581,373	\$2,581,373			
US Bureau of Reclamation			\$1,311,380	\$0		\$1,311,380			
US Fish and Wildlife Service			\$688,620	\$0		\$688,620			
California Dept of Fish and Wildlife					\$0	\$0			
California Dept of Water Resources					\$581,373	\$581,373			
			Federal Costs(\$)				State Cost Share (\$)		Total Costs (\$)
Task	Project Name	Project Description	BOR Restoration Fund	BOR W&RR Fund	FWS Restoration Fund	FWS W&RR Fund	CA DFW	CA DWR	Total Costs (\$)
Program Mgmt & Support			\$237,641		\$236,620				\$474,261
Project 1	CAMP RST Platform Maintenance	Maintain and provide technical support for the CAMP's rotary screw trap platform			\$52,000				\$52,000
Project 2	Stanislaus River Rotary Screw Trap	Maintain and provide technical support for the CAMP's rotary screw trap platform.			\$197,000				\$197,000
Project 3	American River Rotary Screw Trap	Monitor the abundance of juvenile Chinook salmon and steelhead in the American River using a rotary screw trap.			\$103,000				\$103,000
Project 4	Constant Fractional Marking Program	Mark and tag 25% of the fall-run Chinook salmon at the Nimbus Fish Hatchery and Coleman National Fish Hatchery.	\$601,000						\$601,000

Outyear activities are estimates of funding capability only and do not reflect the future Congressional Appropriations process.

Task	Project Name	Project Description	Federal Costs(\$)				State Cost Share (\$)		Total Costs (\$)
			BOR Restoration Fund	BOR W&RR Fund	FWS Restoration Fund	FWS W&RR Fund	CA DFW	CA DWR	
Project 5	Red Bluff Diversion Dam Rotary Screw Trap.	Quantify production of juvenile Chinook salmon and monitor juvenile green sturgeon abundance in the Sacramento River mainstem at the Red Bluff Diversion Dam using rotary screw traps.	\$452,739						\$452,739
Project 6	Constant Fractional Marking Program.	Mark 25% of the fall-run Chinook salmon at the Feather River Fish Hatchery, and mark 100% of the spring-run Chinook salmon produced at that hatchery.						\$581,373	\$581,373
Project 7	CVPIA Accomplishment Database	Development and maintenance of the CVPIA Accomplishment Database	\$10,000						\$10,000
Project 8	CVPIA GIS Network Access Tool (GNAT)	Development and maintenance of the CVPIA GIS Network Access Tool (GNAT)	\$10,000						\$10,000
Project 9	Structured Decision Making	Interagency and other DOI offices & agencies will be working to develop the SDM. This will involve contracting with a facilitator to update the fish restoration plan, hiring consultants, and working with higher level BOR and FWS scientists and managers.			\$100,000				\$100,000

Table 3 – Proposed FY 2014 CAMP Activity (1.3.1)

Project Description:	Rotary Screw Trap Platform Maintenance: Maintain and refine the database and programming code, i.e., platform, necessary to generate consistently generated juvenile Chinook salmon production estimates and confidence intervals from watersheds in the Central Valley.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	1.3.1.
Scope of the monitoring effort:	Central Valley-wide.
Product/deliverable:	Computerized platform capable of producing consistently generated juvenile Chinook salmon production estimates with confidence intervals at different temporal scales. Data will be available to interested parties.
Cost:	\$50,000, but no FY 2014 funds will be required because the work will be funded with USFWS funds that have already been obligated from a prior year.
Questions posed:	The platform will generate data that can be used to answer many questions. For example: “Is the production of juvenile Chinook salmon in the Stanislaus River increasing or decreasing over time relative to ongoing habitat restoration actions?”
Objectives:	Maintain and expand a tool/mechanism that produces juvenile Chinook salmon production estimates in a standardized fashion. The estimates will be used to address CAMP Program Objective #2, i.e., infer the biological response to habitat restoration activities, and provide a basis to adaptively manage future restoration projects so they are more successful.
Results – expected or actual:	Multiple benefits. Elimination of the ambiguities, and reduction in the QA/QC issues, associated with the multiple ways rotary screw trap data are currently being collected in the Central Valley of California. Refinements in the precision and accuracy of juvenile Chinook salmon production estimates will occur. Enhanced ability to identify the habitat restoration activities most beneficial for juvenile salmonids.
Data collection methods:	Not applicable.
Data management:	The platform will be maintained by CAMP and Pacific States Marine Fisheries Commission staff after it has been constructed.
Assessment:	To be determined, based on the questions posed.
Use of information in future decision making:	Multiple benefits. For example, (1) having consistently generated juvenile production estimates and confidence intervals will provide a basis to infer which restoration activities are more likely to lead to the production of juvenile Chinook salmon, and (2) a greater ability to understand how recent declines in Central Valley Chinook salmon abundance are related to the marine or freshwater environments.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.1)

Project Description:	Stanislaus River Rotary Screw Trap: Quantify the production of juvenile Chinook salmon and the abundance of steelhead that emigrate from the Stanislaus River with rotary screw traps.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.1.
Scope of the monitoring effort:	Stanislaus River.
Product/deliverable:	Digital database with raw trap data, and a final report providing an analysis of the trap data.
Cost:	\$195,000.
Questions posed:	How does the production of juvenile Chinook salmon and the abundance of steelhead in the Stanislaus River in 2015 compare to previous years, and how do changes in those numbers relate to ongoing restoration activities?
Objectives:	Collect RST data to quantify the number of juvenile salmonids migrating past a RST during most days between January and June, conduct trap efficiency tests that will be used to quantify daily salmon production estimates, produce a report and digital data that will estimate the production of juvenile fall-run Chinook salmon and the abundance of steelhead in the Stanislaus River.
Results – expected or actual:	The proposed activity will produce digital files with raw data and a final report documenting the results of rotary screw trap operations on the Stanislaus River.
Data collection methods:	One or more rotary screw traps will be used to collect juvenile salmonid data between January and June of 2015.
Data management:	Digital files with raw data will be archived by the CAMP in the CAMP rotary screw trap platform. A final report documenting the results of trapping activities will be available on the CAMP website.
Assessment:	A time series of the production of juvenile Chinook salmon and the abundance of steelhead in the Stanislaus River will be developed to assess temporal trends in abundance, and determine if restoration activities are leading to overall increases in the production of juvenile salmonids.
Use of information in future decision making:	If the assessment does not suggest restoration actions are leading to increases in the production of juvenile salmonids, alternative restoration strategies may be necessary to increase juvenile salmonid production. The information will also be used to guide implementation of Central Valley operations pursuant to the OCAP biological opinion.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.2)

Project Description:	American River Rotary Screw Trap: Quantify the production of juvenile Chinook salmon and the abundance of steelhead that emigrate from the Stanislaus River with rotary screw traps in 2015 and 2016.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.2.
Scope of the monitoring effort:	American River.
Product/deliverable:	Digital database with raw trap data, and a final report providing an analysis of the trap data.
Cost:	\$212,000.
Questions posed:	“How does the production of juvenile Chinook salmon and the abundance of steelhead in the American River in 2015 and 2016 compare to previous years?” And “How do changes in those numbers relate to ongoing restoration activities?”
Objectives:	Collect RST data to quantify the number of juvenile salmonids migrating past a RST during most days between January and June, conduct trap efficiency tests that will be used to quantify daily salmon production estimates, produce a report and digital data that will estimate the production of juvenile fall-run Chinook salmon and the abundance of steelhead in the American River.
Results – expected or actual:	The proposed activity will produce digital files with raw data and a final report documenting the results of rotary screw trap operations on the American River.
Data collection methods:	Multiple rotary screw traps will be used to collect juvenile salmonid data between January and June of 2015 and 2016.
Data management:	Digital files with raw data will be archived by the CAMP in the CAMP rotary screw trap platform. A final report documenting the results of trapping activities will be available on the CAMP website.
Assessment:	A time series of the production of juvenile Chinook salmon and the abundance of steelhead in the American River will be developed to assess temporal trends in abundance. Once sufficient data have been acquired over multiple years, determine if restoration activities are leading to increases in the production of juvenile salmonids.
Use of information in future decision making:	If the assessment does not suggest restoration actions are leading to increases in the production of juvenile salmonids, alternative restoration strategies may be necessary to increase salmonid production. The information will also be used to guide implementation of Central Valley operations pursuant to the OCAP biological opinion.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.3)

Project Description:	Feather River Constant Fractional Marking: Mark 25% of the fall-run Chinook salmon at the Feather River Fish Hatchery, and mark 100% of the spring-run Chinook salmon produced at that hatchery.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.3.
Scope of the monitoring effort:	Feather River.
Product/deliverable:	Report and Excel spreadsheet summarizing the number of fall- and spring-run Chinook salmon marked at the Feather River Fish Hatchery.
Cost:	\$548,000. Funding associated with this project represents the state of California’s in-kind credit (cost share) pursuant to the Sharing of Costs Agreement for Mitigation Projects and Improvements (SCAMPI).
Questions posed:	What is the proportion of wild- vs. hatchery-origin fall- and spring-run Chinook salmon in the Feather River and adjoining watersheds?
Objectives:	Mark juvenile salmon produced at the hatchery so the hatchery proportions for the two runs can be quantified and those data can be used to develop more accurate estimates of the natural production of adult Chinook salmon.
Results – expected or actual:	The marking of the juvenile salmon with coded wire tags and an adipose fin clip will provide a mechanism for differentiating between wild- and hatchery-produced salmon as the adult salmon return to their natal watersheds to spawn.
Data collection methods:	The number of different lots of juvenile Chinook salmon that are marked with different coded wire tag codes will be quantified at the hatchery in the spring of 2015.
Data management:	Digital files with raw data will be archived by the CAMP in a Microsoft Excel spreadsheet. A final report documenting the results of marking activities will be available on the CAMP website.
Assessment:	As adult Chinook salmon that were marked as juvenile fish at the hatchery return to spawn, biologists will recover marked fish and use the ratio of marked to unmarked fish to develop empirical estimates of the hatchery proportions in various watersheds.
Use of information in future decision making:	The data resulting from the marking of the hatchery-origin salmon will provide more accurate estimates of the natural production of Chinook salmon and thereby provide a stronger basis for determining if doubling goals for the Feather River watershed are being met.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.4)

Project Description:	Battle Creek Rotary Screw Trap. Quantify the production of juvenile Chinook salmon that emigrate from Battle Creek with rotary screw traps.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.4.
Scope of the monitoring effort:	Battle Creek.
Product/deliverable:	Digital database with raw trap data, and a final report providing an analysis of the trap data.
Cost:	\$217,376.
Questions posed:	How many juvenile Chinook and steelhead were produced in Battle Creek in 2015? What environmental factors and/or management actions affected juvenile production?
Objectives:	Collect RST data to quantify the number of juvenile salmonids migrating past a RST during most days between January and June, conduct trap efficiency tests that will be used to quantify daily salmon production estimates, produce a report and digital data that will estimate the production of different runs of juvenile Chinook salmon and the abundance of steelhead in Battle Creek.
Results – expected or actual:	The proposed activity will produce digital files with raw data and a final report documenting the results of rotary screw trap operations on Battle Creek.
Data collection methods:	Data will be collected using a rotary screw trap. Regular efficiency trials (5 to 10 per year) will be used to produce passage estimates. Data will be entered directly into an electronic database in the field.
Data management:	Data and reports maintained will be maintained at Red Bluff Fish and Wildlife Office and reported on the CAMP’s website. Data will be integrated into CAMP rotary screw trap platform, and summarized data will be disseminated to interested parties via email and the Internet.
Assessment:	Passage estimates will be analyzed relative to environmental variables, and restoration and management activities.
Use of information in future decision making:	Information is used to evaluate the benefits of habitat restoration and flow and temperature management, to suggest and design future restoration actions, and to estimate carrying capacity which will be used to set overall program goals. The information will also be used to guide implementation of Central Valley operations pursuant to the OCAP biological opinion.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.5)

Project Description:	Winter-run Chinook Salmon Carcass Survey. Quantify the escapement (production) of adult winter-run Chinook salmon on the Sacramento River mainstem.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.5.
Scope of the monitoring effort:	Sacramento River mainstem.
Product/deliverable:	Report and Excel spreadsheet summarizing the number of adult winter-run Chinook salmon observed.
Cost:	\$188,260.
Questions posed:	How many winter Chinook return to spawn in the upper Sacramento River? What is the proportion of hatchery-origin fish amongst winter Chinook spawners? What are the spatial and temporal distributions of hatchery- and natural-origin winter-run Chinook salmon spawners?
Objectives:	Estimate spawner abundance of winter-run Chinook salmon. Determine phenotypic characteristics of hatchery- and natural-origin winter-run Chinook salmon. Evaluate effects of the winter-run Chinook salmon propagation program at the Livingston Stone National Fish Hatchery (LSNFH).
Results – expected or actual:	Annual estimate of winter Chinook abundance, assessment of hatchery contributions, and evaluation of hatchery contributions and influence.
Data collection methods:	Conduct daily carcass mark-and-recapture surveys for upper 26-miles of the Sacramento River. Estimate spawning escapement of winter-run Chinook salmon. Evaluate contribution of hatchery-origin winter-run Chinook salmon from the LSNFH.
Data management:	Estimate of spawner abundance is generated annually, in time for consideration of ocean harvest management process. Report of hatchery contributions is completed annually. Survey data are maintained by FWS and the California DFW.
Assessment:	Spawner escapement data are used to assess population status and trends, and evaluate the supplementation program at the LSNFH and thereby inform hatchery operations. Spawner distribution data are used to inform water management actions (e.g., releases from Shasta reservoir).
Use of information in future decision making:	Trends of escapement can be used to evaluate influences of management actions. Escapement data is used to inform CVP operations. Phenotypic comparisons between hatchery- and natural-origin salmon provide the basis for evaluating hatchery operations and effects. The information will also be used to guide implementation of Central Valley operations pursuant to the OCAP biological opinion.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.6)

Project Description:	CWT Recovery on Cottonwood Creek/Sacramento River: Quantify the relative proportions of wild- and hatchery-origin adult salmon in two watersheds.
FY 2014 Project Complete?	Yes, the project will be completed at the end of FY 2014.
CVPIA annual work plan subtask number:	4.1.6.
Scope of the monitoring effort:	Cottonwood Creeks and a portion of the Sacramento River.
Product/deliverable:	Digital spreadsheets with coded wire tag data from the two watersheds, and a final report providing an analysis of that data.
Cost:	\$25,000, but no FY 2014 funds will be required because the work will be funded with USFWS funds that have already been obligated from a prior year.
Questions posed:	What is the prevalence of hatchery-origin adult Chinook salmon in Cottonwood Creek and the Sacramento River?
Objectives:	Collect adult Chinook salmon from Cottonwood Creek and a portion of the Sacramento River mainstem and retrieve coded wire tags (CWTs) with the goal of quantifying the proportion of wild- vs. hatchery-origin salmon in those two watersheds.
Results – expected or actual:	An assessment of the prevalence of hatchery-origin salmon in one watershed where a fish hatchery does not occur, and another hatchery where a hatchery is present. The study will also provide data that can be entered in the Chinookprod database used to calculate the production of adult Chinook salmon.
Data collection methods:	Survey crews will use kayaks and boats to recover adult Chinook salmon carcasses. Heads from salmon that lack an adipose fin indicating a possible hatchery-origin will be collected so coded wire tags from those salmon can be recovered and analyzed.
Data management:	Digital files with summaries of the salmon-related data will be developed. A final report documenting the results of salmon data will be developed and posted on the CAMP’s website.
Assessment:	The collection of coded wire tags provides a mechanism for quantifying the prevalence of hatchery-origin salmon.
Use of information in future decision making:	Determine if an AFRP Chinook salmon doubling goal is being met. If one of those goals is not being met, additional restoration activities in a watershed will likely be needed to increase natural salmon production. Assess the effect of hatchery operations on the natural production of adult Chinook salmon.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.7)

Project Description:	Red Bluff Diversion Dam Rotary Trap: Quantify production of juvenile Chinook salmon and monitor juvenile green sturgeon abundance at the Red Bluff Diversion Dam (RBDD) using rotary screw traps.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.7.
Scope of the monitoring effort:	Determines production of naturally-produced juvenile Chinook salmon, steelhead, and green sturgeon emigrating from the Upper Sacramento River above Red Bluff Diversion Dam.
Product/deliverable:	Annual report and real-time bi-weekly reports.
Cost:	\$896,783.
Questions posed:	How many naturally produced juvenile Chinook and steelhead emigrate from the upper Sacramento River? How does the direct measure of juvenile winter run production compare to adult escapement and the NOAA Fisheries juvenile production estimate model? What is the relative abundance of age-0 green sturgeon passing RBDD annually?
Objectives:	Monitor the annual production of four runs of Chinook salmon, steelhead trout and green sturgeon produced above RBDD. Compare juvenile winter-run Chinook salmon production with adult escapement values to evaluate water operations and habitat improvement efforts.
Results – expected or actual:	Rotary screw traps attached to RBDD will be used to produce weekly, monthly, and annual salmon production estimates and relative abundance estimates for green sturgeon.
Data collection methods:	Operate rotary screw traps, and collect juvenile fish data on a daily basis.
Data management:	Data and reports are maintained at Red Bluff Fish and Wildlife Office and reported on that office’s website (http://www.fws.gov/redbluff/default.html). Data will be integrated into CAMP rotary screw trap platform, and summarized data will be disseminated to interested parties via email and the Internet.
Assessment:	Winter-run Chinook salmon production data will be used to help evaluate effects of management actions (e.g., Shasta Dam releases, water temperatures, habitat projects, south Delta export actions). Production and relative abundance data will be used to assess threatened and endangered species status and trends.
Use of information in future decision making:	Salmon production data will help with prioritization of the limiting factors on which to focus management actions. The information will also be used to guide implementation of Central Valley operations pursuant to the OCAP biological opinion.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.8)

Project Description:	Nimbus and Coleman Constant Fractional Marking: Mark 25% of the juvenile fall-run Chinook salmon produced at the Coleman National Fish Hatchery (CNFH) and Nimbus Fish Hatchery (NFH).
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.8.
Scope of the monitoring effort:	American River and Battle Creek.
Product/deliverable:	Report and Excel spreadsheet summarizing the number of juvenile fall-run Chinook salmon marked at the CNFH and NFH.
Cost:	\$688,092. This amount may not be the total amount to conduct the proposed activity.
Questions posed:	What is the proportion of wild- vs. hatchery-origin fall-run Chinook salmon in American River, Battle Creek, and adjoining watersheds?
Objectives:	Mark juvenile salmon produced at the hatcheries so the hatchery proportions of fall-run Chinook salmon can be quantified and those data can be used to develop more accurate estimates of the natural production of adult Chinook salmon.
Results – expected or actual:	The marking of the juvenile salmon with coded wire tags and an adipose fin clip will provide a mechanism for differentiating between wild- and hatchery-origin salmon as the adult salmon return to their natal watersheds to spawn.
Data collection methods:	The number of different lots of juvenile Chinook salmon that are marked with different coded wire tag codes will be quantified at the hatchery in the spring of 2015.
Data management:	Digital files with raw data will be archived by the CAMP in a Microsoft Excel spreadsheet. A final report documenting the results of marking activities will be available on the CAMP website.
Assessment:	As adult Chinook salmon that were marked as juvenile fish at the hatchery return to spawn, biologists will recover marked fish and use the ratio of marked to unmarked fish to develop empirical estimates of the hatchery proportions in various watersheds.
Use of information in future decision making:	The data resulting from the marking of the hatchery-produced fish will provide more accurate estimates of the natural production of Chinook salmon and thereby provide a stronger basis for determining if AFRP doubling goals for watersheds in the Central Valley are being met.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.9)

Project Description:	Battle Creek Adult Salmonid Monitoring: Quantify the production (escapement) of adult spring-run Chinook salmon and monitor the abundance of adult steelhead in Battle Creek.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.9.
Scope of the monitoring effort:	Battle Creek.
Product/deliverable:	Report and Excel spreadsheet summarizing the number of adult spring-run Chinook salmon and steelhead in Battle Creek.
Cost:	\$177,157.
Questions posed:	What is the escapement of adult spring-run Chinook salmon and steelhead in Battle Creek? Is the Battle Creek Restoration Project effective in improving salmonid populations?
Objectives:	Evaluate the population status and trend of two threatened salmonid species in Battle Creek. A secondary objective is to block the passage of hatchery-produced salmon and steelhead that attempt to move into the upper Battle Creek watershed where managers are attempting to maximize the production of Federally listed salmonids.
Results – expected or actual:	Develop escapement estimates listed and non-listed salmonids ascending the fish ladder at Coleman National Fish Hatchery.
Data collection methods:	Capture fish in a trap from March through May while water temperatures are sufficiently cool to minimize stress to the fish. Collect video data that can be used to estimate fish passage from May to August when average water temperatures are above 60°F.
Data management:	Data and reports maintained by the Red Bluff Fish and Wildlife Office and reported on that office’s website at (http://www.fws.gov/redbluff/default.html).
Assessment:	Results will be used by the Battle Creek Adaptive Management Teams to evaluate water management and restoration actions relating to the OCAP biological opinion’s Reasonable and Prudent Action 1.2.6 “Restore Battle Creek for Winter-Run, Spring-Run, and CV Steelhead”.
Use of information in future decision making:	Information will be used to plan and implement water management and restoration actions. Information will be used in future status assessments and listing decisions for listed salmonids. The information will also be used to guide the management of Central Valley Project-related facilities pursuant to the OCAP biological opinion.

Table 3 – Proposed FY 2014 CAMP Activity (4.1.10)

Project Description:	San Joaquin River Delta Chinook Salmon Survival Study: Quantify the survival of juvenile Chinook salmon as they migrate through the lower San Joaquin River and Sacramento River/San Joaquin River Delta.
FY 2014 Project Complete?	No.
CVPIA annual work plan subtask number:	4.1.10.
Scope of the monitoring effort:	San Joaquin River and Sacramento River/San Joaquin River Delta (Delta).
Product/deliverable:	Report and digital files summarizing the survival of juvenile Chinook salmon as they move through different parts of the Delta.
Cost:	\$400,000. This amount of funding does not cover the entire cost of the proposed survival study.
Questions posed:	What is the survival of emigrating salmon smolts as they move from Durham Ferry and Mossdale through the Delta to Jersey Point and Chipps Island? What is the survival for juvenile salmon taking multiple pathways to Jersey Point and Chipps Island (e.g., Old River route versus the San Joaquin River route)? What is the role and influence of flow and exports and potential predation on survival in these river reaches?
Objectives:	Estimate juvenile salmon survival through the Delta in May of 2014 and identify proportional causes of mortality hypothesized to be related to operational changes in hydrology (i.e., reverse flows, San Joaquin inflow, export volume) and other CVP project and non-project effects on juvenile salmon smolts.
Results – expected or actual:	Probabilities that indicate the survival or death of juvenile salmon as they move through different parts of the Delta.
Data collection methods:	Acoustic tags will be surgically implanted into salmon smolts and those fish will then be released at two or more locations in the Delta. As the tagged salmon move through the Delta, their movements will be monitored with acoustic receiver devices that are deployed at several locations in the Delta.
Data management:	Data and reports will be maintained by Stockton Fish and Wildlife Office staff. A report with the study results will be provided on the Internet at http://www.sjrg.org/technicalreport/ .
Assessment:	An evaluation of the monitoring data collected with the acoustic receiver arrays will be used to assess the travel paths of tagged salmon following their release. The data from the receivers will be integrated with hydrologic data to assess the relationship between salmon movement patterns and different hydrologic variables.
Use of information in future decision making:	Information from the study could be used to manage CVP-related facilities so the entrainment and mortality of juvenile salmon is reduced, thereby increasing the likelihood that surviving salmon are able to contribute to AFRP fish production targets.