

# Draft CVPIA Fiscal Year 2014 Annual Work Plan

**April 28, 2013**

## **Program Title:**

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

## **Responsible Entities:**

<b>Staff Name</b>	<b>Agency</b>	<b>Role</b>
Tom T. Kisanuki	Bureau of Reclamation	Lead
Matt R. Brown	Fish and Wildlife Service	Co-Lead
Tricia A. Bratcher	Department of Fish and Wildlife	State Partner
Aric Lester	Department of Water Resources	State Partner

## **Program Goals and Objectives for FY 2014**

The goal of the Central Valley Project Improvement Act (CVPIA) as stated in Section 3406 (b)(12) for Clear Creek is to:

“develop and implement a comprehensive program to provide flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead from Whiskeytown Dam as determined by instream flow studies conducted by the California Department of Fish and Game after Clear Creek has been restored and new fish ladder has been constructed at the McCormick-Saeltzer Dam. Costs associated with channel restoration, passage improvements, and fish ladder construction required by this paragraph shall be allocated 50 percent to the United States as a nonreimbursable expenditure and 50 percent to the State of California. Costs associated with providing the flows required by this paragraph shall be allocated among project purposes.”

Additionally, the CVPIA mandated the Secretary of the Interior to develop and impel a program that makes all reasonable efforts to double natural production of anadromous fish in Central Valley streams (Section 3406 (b)(1)(1).; this program is known as the Anadromous Fish Restoration Program (AFRP). The AFRP’s “Final Restoration Plan” for the AFRP provides programmatic level direction and identifies actions and evaluations that are intended to increase production. The Restoration Plan has six actions and one evaluation for Clear Creek. These actions, for example address seasonal flow releases from Whiskeytown Dam, gravel replenishment through augmentation, halting channel degradation and restoring channel conditions, preserving the habitat productivity through cooperative watershed management, etc.

Therefore, the CVPIA legislation continues to be a driving force in defining the activities of this and previous annual work plans.

### **Goal A - Provide flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead.**

Flows and temperatures must be provided and managed through releases from Whiskeytown Dam on a year-round basis to support the different life stages of salmon and steelhead in Clear Creek. The amounts of water, considering timing, magnitude, and duration, and water temperature are controlled to meet this goal.

Objectives: 1) provide minimum instream flows that create habitat that is at least 90 percent of the maximum possible, 2) provide temperature control flows to meet Igo gage water temperature criteria

including 60°F from June 1 through September 15, and 56°F from September 15 through October 31, 3) provide annual adult attraction flows that result in 67 percent of adult spring Chinook being distributed upstream of the Igo gage and all being distributed upstream of the segregation weir, and 4) provide additional channel maintenance flows of 3,250 to 6,000 cfs in 3 years out of 10, to create and maintain the habitats upon which anadromous salmonids depend.

Task 1.1.2 – Coordinate monitoring results with the Clear Creek Technical Team, the (b)1 IFIM Program, the (b)2 Water Program, the Environmental Water Program (EWP), the fishery regulatory agencies, and Reclamation’s Central Valley Operations group, to guide adaptive flow management and evaluate results.

Task 2.4.1 – Assist Environmental Water Program (EWP) with NEPA / CEQA / Environmental compliance for Channel Maintenance Flows required by NMFS OCAP BO RPA Action I.1.2. Federal and State specialists provide technical expertise (fish biologists, geomorphologists) in the development of the EWP.

Task 3.1.1 - Provide funding for wheeling water for the McConnell Foundation. This is a perpetual legal compensation requirement resulting from the removal of the McConnell Foundation’s Saeltzer-McCormick Dam.

### **Goal B – Restore the stream channel and associated instream habitat.**

Objectives: 1) restore a 2 mile section of Clear Creek floodplain and stream channel degraded by aggregate and gold mining, dams and diversions, 2) annually inject 17,000 tons of spawning gravel to recharge and maintain the system, 3) by 2020, create and maintain 347,288 square feet of usable spawning habitat between Whiskeytown Dam downstream to the Former McCormick-Saeltzer Dam, and 4) reduce fine sediments through erosion control, mechanical removal and channel maintenance flows.

Task 2.4.2 – Cloverview Mercury Abatement and Fish Restoration Project (aka Clear Creek Long-Term Gravel Supply Project). NEPA / CEQA / Environmental compliance for a project that processes a 40-year supply of spawning gravel from Clear Creek through reclaimed historic mining tailings.

Task 2.7.1 – Lower Clear Creek Floodway Restoration Project, Phase 3B. Revegetate restored floodplain, reroute and decommission roads used for restoration, and develop scour channels that reduce salmonid stranding.

Task 2.7.2 – Lower Clear Creek Parkway Project. Conduct post-project monitoring to evaluate the benefits of the project.

### **Goal C – Determine impacts of restoration actions on anadromous fish and geomorphology.**

Objective: Conduct fishery and geomorphic monitoring at levels necessary to ascertain project effects on fishery and geomorphic resources. These are annual activities.

Task 4.1.1 – Conduct juvenile salmonid monitoring using rotary screw trapping to estimate spring Chinook production. This activity assesses whether CVPIA goals are being met.

Task 4.1.2 – Conduct spawning area mapping to evaluate the benefit of restoration actions (habitat improvement, spawning gravel augmentation, channel maintenance flows, and segregation weir operation) on fall Chinook.

Task 4.1.3 – Conduct spawning habitat suitability mapping to evaluate the benefit of restoration (habitat improvements, spawning gravel augmentation and channel maintenance flows,) actions on spring Chinook.

Task 4.1.4 – Evaluate gravel size-distributions to evaluate the effectiveness of gravel additions and pulse flows.

Task 4.1.5 – Conduct geomorphic monitoring to document in-stream channel and habitat conditions as a means to evaluate the effectiveness of restoration program actions in Clear Creek, such as spawning gravel injections. This work also evaluates effectiveness of pulse flows for both channel maintenance and fish passage needs.

### ***Supporting documents***

1) CVPIA Section 3406 (b)(1), (b)(12), (b)(13); 2) Record of Decision, Central Valley Project Improvement Act; 3) CALFED Bay-Delta Programmatic Record of Decision, proposed Ecosystem Restoration Program stage 1 actions; 4) CALFED Ecosystem Restoration Program Strategic Plan For Ecosystem Restoration, action 3, page D-23; and 5) Biological Opinion on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan, National Marine Fisheries Service, June 2009.

### ***Status of the Program***

In addition to meeting the goals of the CVPIA, most actions in this Annual Work Plan are also included in the Reasonable and Prudent Alternative of the Central Valley Project Operation Criteria and Plan Final Biological Opinion from the National Marine Fisheries Service (NMFS OCAP BO).

### **Goal A – Provide Flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead.**

#### ***Minimum Instream Flows and Temperature Control***

Interim minimum instream flow increases began in 1995 and have occurred every year since. Pre-CVPIA baseline flows were 50 cfs between January and October and 100 cfs in November and December. Under (b)(2), interim flows were increased to 200 cfs from October through June and approximately 70 to 250 cfs during the summer for temperature control. Minimum flows of 200 cfs between October 1 and May 31 meet the objective of providing 90% of the maximum possible habitat for all life stages and runs of salmonids and have been achieved in all but one year since 1999. Temperature control targets of 60°F from June 1 through September 15 and 56°F from September 15 through October 31, have also been met in most years. However the later target has not been met in the last 3 years. In 2011 and 2012, the Clear Creek Technical Team proposed many actions to improve future water temperatures, some of which were successfully implemented.

The interim minimum flow prescription was recommended by the AFRP Working Paper which derived its recommendations from an Instream Flow Incremental Methodology (IFIM) study conducted in the mid 1980's. The FWS began a new long-term IFIM study in 2004 to reassess flow requirements taking into account changes in instream habitat resulting from CVPIA restoration efforts. The field study portions of this study are completed, four reports have been completed, and a draft synthesis report was in preparation during 2013.

The IFIM synthesis report, once finalized, will be used by Reclamation and the Clear Creek Technical Team to develop a new long-term flow prescription, which will be proposed to NMFS under terms of the OCAP BO RPA I.1.6. The RPA I.1.6 prescription could result in proposed flows to: 1) meet habitat needs based on IFIM and habitat suitability study results; 2) provide temperature control; 3) move and maintain spawning gravels and create and maintain riparian vegetation; 4) avoid stranding; and 5) encourage anadromy of *Oncorhynchus mykiss* (steelhead / rainbow trout) through an adaptive management approach. Related to providing temperature control (item number 2), the Clear Creek Technical Team discussed and may recommend many actions such as: a) Avoid full power peaking; b) Replace Oak Bottom TCC; c) Ramp down fall flows (allows higher flows during temperature control); d) Move Igo temperature compliance point; e) Use upper Whiskeytown outlets when temperatures are not warm; f) Improve water temperature modeling (RPA I.1.5); and g) Evaluate temperature control curtains (RPA I.1.4). In addition, in 2014 and 2015 monitoring will be needed to guide adaptive management to encourage anadromy (item number 5).

#### ***Attraction Pulse Flows***

Adult spring Chinook have been distributed too far downstream of the Igo temperature compliance point. On average, 50% hold downstream of Igo and 14% hold downstream of the segregation weir.

These adults and their redds are therefore not fully protected by temperature control criteria. The objective of the pulse flows is to enable or encourage adult Spring Chinook to move further upstream so that 67 percent are upstream of the Igo gage and all are upstream of the segregation weir. The Igo gage is 67 percent of the way from Whiskeytown to the segregation weir. Two pulse flows were provided each spring in 2010, 2011, and 2012. The first of two pulse flows for 2013 was provided during April, to help attract spring Chinook into Clear Creek; with a second pulse event scheduled for June. The results of these past flows have been inconclusive. Based upon recommendations from the Clear Creek Technical Team, the April 2013 flow-timing, magnitude and duration of the flows were changed to improve their effectiveness. Similar flow events will occur each year as directed by the NMFS OCAP BO.

### ***Channel Maintenance Flows***

Studies have been undertaken by CVPIA and CALFED since 1999 to develop channel maintenance flows, which may be vital for maintaining ecosystem processes that provide salmonid habitat in Clear Creek. These efforts resulted in a FWS proposal to Reclamation to re-operate Whiskeytown Dam, between March 1 and May 15, such that a glory hole spill produces a minimum target release of 3,250 cfs for one day occurring three times in a ten year period. Flows of this magnitude and duration could reactivate fluvial geomorphic processes to re-create and maintain diverse instream and floodplain habitat required to support and recover aquatic and riparian species. This flow prescription is also required in the NMFS OCAP BO.

In 2008, CALFED contracted with FWS EWP for program management to facilitate a pilot channel maintenance flow. The program includes subcontracts with Reclamation's Denver Technical Service Center, ESSA Ltd, Graham Matthew and Associates (GMA), and Stillwater Sciences. This contract will develop forecast and decision making tools, finalize implementation and monitoring plans, provide geomorphic and fisheries evaluations and pay for foregone power generation. The contract does not include funding for monitoring and EWP is looking to CVPIA to provide additional monitoring.

ESSA conducted a workshop, in October 2011, in Sacramento to ensure that best available information is used in the development of an on-the-ground in-season operational plan. Various levels of governing (federal, state, local, and quasi) agencies collaborated to identify data gaps and uncertainties, understand operational tools, identify resources needed, ensure safety-of-dams considerations, and mitigate for foregone power revenues. In February 2012, a three-day workshop was conducted to develop a monitoring and adaptive management plan. A hydrologic study was also conducted to estimate the safe channel capacity of Clear Creek during flooding in the Sacramento River. Fortunately, the channel capacity in the areas most susceptible to flooding exceeded that used in previous modeling for the project. Reclamation will work to secure NEPA / CEQA and other environmental compliance permits in 2014. To date, the program has not attempted to provide the objective of additional channel maintenance flows of 3,250 to 6,000 cfs in 3 years out of 10, to create and maintain the habitats upon which anadromous salmonids depend.

### **Goal B – Restore the stream channel and associated instream habitat.**

#### ***Stream Channel Restoration***

The Stream Channel Restoration project is a construction project designed to eliminate gravel extraction pits, restore a functional floodplain, and increase salmonid spawning and juvenile rearing habitat in a two-mile section of creek significantly degraded by gold and aggregate mining. Four phases of the project are complete including: Phase 1 in 1998, Phase 2A in 1999, Phase 2B in 2001, Phase 3A in 2002, Redding Bar in 2003 and Phase 3B in 2008. Phases 3A and 3B created new stream channels and the other phases filled gravel extraction pits, created and vegetated floodplain habitat and reduced most of the potential for fish stranding in the project area. ERP provides funding for Phase 3B, with roadwork underway during FY 2013, and riparian stabilization work currently scheduled for implementation in FY 2014. Phase 3C would create floodplain and stream channels in the lowest part of the reach. On-going analyses of geomorphic function, fish and wildlife limiting factors and priorities, mercury contamination,

landownership, and cost-effectiveness, plus an inventory of other restoration opportunities in the watershed, is expected to result in restoration recommendations for Phase 3C in FY 2014.

### ***Spawning Gravel Supplementation***

Spawning gravel supplementation is a long-term need created by the construction of Whiskeytown Dam, which blocks gravel from moving downstream into the areas of Clear Creek where salmonids spawn. By the year 2020 the overall goal is to create and maintain 347,288 square feet of usable spawning habitat between Whiskeytown Dam downstream to the former McCormick-Saeltzer Dam, the amount that existed before construction of Whiskeytown Dam. Between 1996 and 2012, a total of approximately 152,012 tons of spawning gravel was added to the creek. In 2012, a total of ten thousand tons of gravel were placed at four sites: Below NEED Camp (Guardian Rock site), Placer Bridge, Clear Creek Road Crossing, and at Tule Backwater. The 10,000 tons is 59% of the CPAR annual goal. The programs' annual spawning gravel addition target is 17,000 tons per year, but only an average of 8,942 tons has been placed annually since 1996. Long-term environmental permits for spawning gravel addition and instream structure placement projects continued during 2013. A gravel injection project did not occur in 2013.

CVPIA has provided funding for the design and permitting of projects on BLM and DFG lands to provide a long-term supply of spawning gravel. The projects would reduce the threat of mercury contamination through separation and relocation of contaminated materials, and provide an economical 40-year supply of gravel, while using renovated mine tailings to restore (e.g. filling in deep pits) floodplain and upland habitats. In 2012 these projects were funded by the Ecological Restoration Program (ERP) using state funds. The final proposal included increased funding for monitoring mercury, riparian and avian impacts, for riparian revegetation and wetlands creation, and for improved designs taking into account the significant learning that has occurred in Clear Creek since 1996. Pre- and post-project monitoring to evaluate the success of the project will serve as a basis for improving future projects in Clear Creek.

### ***Erosion Control***

In the 1990's many programs including CVPIA funded erosion control projects in Clear Creek. By 2003 all of the cost-effective projects had been completed. Unfortunately in more recent years there have been large increases in deleterious fine sediment due to wildfire. In 2008, wildfire burned significant portions of the Clear Creek watershed resulting in fire line building, road building and salvage logging. Since 2009, large amounts of fine sediment entered Clear Creek and covered large areas of injected spawning gravels that were funded in previous years through CVPIA and CALFED. Efforts to remove this sediment and inventory its sources will be needed to avoid further degradation of habitat.

In July 2012, a 1,038 acre wildfire burned the entire project area of the long-term gravel supply project including about 10% of the creeks length. In some areas of higher fire intensity, large amounts of deleterious fine sediment are poised to be delivered to the creek during rains. The Clear Creek Technical team has worked with the land-owning agencies to remediate the impacted areas prior to the FY 2013 rainy season. The CDFW and BLM conducted various soil stabilization efforts during 2013 to reduce the impacts from storm runoff.

### ***Adaptive Management***

#### **Goal C – Determine impacts of restoration actions on anadromous fish and geomorphology.**

***Spawning gravel-size specifications improved based on monitoring.*** Spawning ground surveys and spawning habitat suitability surveys identified that Chinook were no longer using the spawning gravel provided by the program in the reach directly downstream of Whiskeytown Dam. Gravel-size distributions suggested that only smaller size gravel was being delivered to spawning areas due to reduced high flows from Whiskeytown Reservoir, and that the size specifications being used for

restoration in this area did not contain enough larger material. Therefore gravel size specifications were increased for projects implemented in 2012. Further monitoring will be needed to complete the adaptive management cycle and verify if Chinook use the new gravel. Spawning studies conducted by FWS and geomorphic studies conducted by GMA also suggested that some spawning gravel projects performed better than others. These results were used to improve projects conducted in 2012 and to prioritize sites for future spawning gravel augmentations.

***Stream channel restoration designs improved based on monitoring.*** In 2012, stream channel restoration Phase 3B designs were improved by monitoring and evaluations. Based on monitoring results, plans and designs were made for habitat improvements in scour channels and riparian vegetation and for the reduction of negative habitat fragmentation by decommissioning of roads used during habitat restoration. Funding from ERP will allow full completion of project construction in FY 2014. In addition, the final proposal for the long term gravel supply project was greatly improved by the significant learning that has occurred in Clear Creek since 1996. This has included monitoring of birds, riparian vegetation, wetlands, mercury, and benthic macroinvertebrates in addition to geomorphology and fish.

***Monitoring the impacts of wildfire will guide erosion control.*** The aforementioned 2008 wildfire in the South Fork Clear Creek tributary, and subsequent salvage logging and road building contributed to a significant instream sediment problem. These observations led to topographic surveys to quantify the amount of fine sediment delivered to the creek, bulk sampling to estimate changes in sediment size, and snorkel surveys to locate the downstream extent of sand deposition in pools. Information was synthesized by the Clear Creek Technical Team to evaluate options and to identify the most appropriate solutions: sediment removal from a large pool, an erosion inventory, and erosion control. These actions may be funded in 2014. Funding will be needed to monitor and evaluate the effectiveness of these actions and to determine whether additional remedial measures will be necessary. Since the 2008 fires, the juvenile productivity of steelhead and spring and fall Chinook has decreased, although it is not yet clear by why. It appears possible that the amount of fine sediment has been decreased, perhaps by the seven pulse flows that have occurred since the fire.

***Fish and geomorphic monitoring results may improve future pulse flows.*** Results of pulse flows in FY 2010 suggested that higher flows would provide more favorable geomorphic outcomes. In addition, it was determined that higher flows could have been provided without impacting the ability of the Clear Creek Community Services District to receive water. The 2010 results led to experimental flows in 2011, which were successful in achieving higher flows, and moving more sediment downstream. Therefore in 2012 both higher and lower flows were provided. The Clear Creek Technical Team requested that NMFS modify the OCAP RPA I.1.1 to provide more flexibility and aid in adaptive management. The proposal would allow the Clear Creek Technical Team to recommend to NMFS and Reclamation, changes in the timing, magnitude and duration of the spring attraction flows to better meet objectives of the Clear Creek RPA actions, additional ecosystem goals, operational constraints, and adaptive management. This proposal was prompted by the results from fish, geomorphic, avian and riparian monitoring.

***Fish Population Monitoring Suggests Program Success.*** Monitoring continues to document the overall success of the Clear Creek Restoration Program. No other Central Valley watershed has survived the Chinook fishery collapse nearly as well as Clear Creek. This may be due to increased resilience of the watershed due to CVPIA's habitat restoration. In 2011, fall-run Chinook escapement was 4,841 compared to the average baseline escapement of 1,689 between 1967 and 1991. Escapement appeared lower in 2011 than in the previous 10-years (average of 8,825), in part because the method for estimating escapement was changed. Using the old method the 2011 escapement would be 6,332 (31% higher). In addition, spawning populations of threatened spring Chinook and steelhead have been re-established in the watershed.

The recent CDFW Central Valley Steelhead Monitoring Plan and Central Valley Chinook Monitoring Plan recommended that a counting weir be used in Clear Creek to monitor adult populations of salmon and steelhead. In 2012 CVPIA partnered with CDFW to build and install a fish counting weir in Clear Creek near the confluence with the Sacramento River. The weir was operated by CDFW during the fall of 2012 and will be operated by the FWS the rest of the year to monitor spring and late fall Chinook and steelhead.

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. Monitoring results were reported to the Clear Creek Technical Team, and in annual reports. This information was used in budget and project planning and the design of restoration projects.

Table 1. FY2014 Proposed Activities and Costs

CVPIA Section 3406 (b)(12), Clear Creek Restoration

	3406 (b)(12) Requested Funding for Fiscal Year 2014				
	Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources
<b>Total Funding</b>	\$1,376,957	\$0	\$650,869	\$2,162,223	\$4,190,049
<b>Reclamation</b>	\$377,788	\$0			\$377,788
<b>Service</b>	\$999,169	\$0			\$999,169
<b>CA DFG</b>			\$0	\$0	\$0
<b>CA DWR</b>			\$0	\$15,000	\$15,000

1.1 Program Management											
AWP Activity Number	Activity Name	Activity Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(12) 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	BOR Lead	Bureau of Reclamation, Lead Program Manager. Provides program management, budgeting, preparation and oversight of restoration/project contracts. Participates in interagency program development, BOR representative to the Clear Creek Technical Work Group Team, prepares Purchase Recquisitions for program related procurements and contracts, serves as the COR on restoration projects.	BOR	0.47			\$87,346				\$87,346
1.1.2	FWS Co-Lead	U.S. fish and Wildlife Service, Co-Lead Program Manager. Provides program management, budgeting, program reviews, and leads/conducts biological monitoring programs in Clear Creek. Represents USFWS on the Clear Creek Technical Work Group Team.	FWS	0.42			\$102,648				\$102,648
							<b>Sub-Total for Program Management, FY2014</b>				
							<b>Restoration Fund</b>	<b>Water and Related Resources</b>	<b>State Cash</b>	<b>State In-Kind</b>	<b>Total All Sources</b>
<b>Subtotal Funding</b>							\$189,994	\$0	\$0	\$0	\$189,994
<b>Reclamation</b>							\$87,346	\$0			\$87,346
<b>Service</b>							\$102,648	\$0			\$102,648
<b>CA DFG</b>									\$0	\$0	\$0
<b>CA DWR</b>									\$0	\$0	\$0



1.2		Program Support										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(12) 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	CDFW Technical Advisor	California Department of Fish and Wildlife Technical Advisor	CDFW	0.03						\$7,447	\$7,447	
1.2.2	CDWR Technical Advisor	California Department of Water Resources Technical Advisor	CDFW	0.04						\$9,776	\$9,776	
1.2.3	BOR Contracting Services	Bureau of Reclamation Contracting Services	BOR	0.04			\$8,921				\$8,921	
1.2.4	BOR Acquisition Services	Bureau of Reclamation Acquisition Services	BOR	0.04			\$8,921				\$8,921	
1.2.5	BOR Administrative Support	Bureau of Reclamation Administrative Support Services	FWS	0.02			\$4,461				\$4,461	
							<b>Sub-Total for Program Support, FY2014</b>					
							<b>Restoration Fund</b>	<b>Water and Related Resources</b>	<b>State Cash</b>	<b>State In-Kind</b>	<b>Total All Sources</b>	
							<i>Subtotal Funding</i>	\$22,303	\$0	\$0	\$17,223	\$39,526
							<i>Reclamation</i>	\$17,842	\$0			\$17,842
							<i>Service</i>	\$4,461	\$0			\$4,461
							<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)(12) 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	Technical Support to CCTWG	Technical support and participation in the Clear Creek Technical Work Group	CDFW	0.06						\$15,000	\$15,000	
1.3.2	Technical Support to CCTWG	Technical support and participation in the Clear Creek Technical Work Group	CDWR	0.06						\$15,000	\$15,000	
							Sub-Total for Technical Support, FY2014					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$0	\$0	\$0	\$30,000	\$30,000
							<i>Reclamation Service</i>	\$0	\$0			\$0
							<i>CA DFG</i>			\$0	\$0	\$0
							<i>CA DWR</i>			\$0	\$15,000	\$15,000

2.4		Environmental Compliance				3406 (b)(12) Requested Funding for Fiscal Year 2014						
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(12) Requested Funding for Fiscal Year 2014					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
2.4.1	Environmental Water Program Permits	Environmental Planning and Permitting costs to implement the Environmental Water Program (EWP). The EWP program will release a experimental/pilot flow of 3,250 cfs from Whiskeytown Dam to help induce geomorphic processes in Clear Creek to promote maintenance and improvement of habitat for anadromous salmonids.	BOR	0.00	n/a	0	\$25,000				\$25,000	
2.4.2	Cloverview Mercury Abatement and Fish Restoration Project	Environmental Planning and Permitting costs to complete the Cloverview Mercury Abatement and Fisheries Restoration Project ("Cloverview"). The Cloverview project will process historic mining tailings along Clear Creek to remove mercury laden sediments, and these sediments will be sequestered and stored properly to prevent mercury-laden material from re-entering the aquatic habitat. The processing of the tailings will also yield a 40-year supply of gravel, to be used for the annual spawning gravel injection program. (please refer to section 2.7.2 for further details)	BOR	0.00	n/a	0	\$50,000		\$0		\$50,000	
2.4.3	Cloverview Mercury Abatement and Fish Restoration Project	Environmental Planning and Permitting costs to complete the Cloverview Mercury Abatement and Fisheries Restoration Project ("Cloverview"). The Cloverview project will process historic mining tailings along Clear Creek to remove mercury laden sediments, and these sediments will be sequestered and stored properly to prevent the mercury-laden material from re-entering the aquatic habitat. The processing of the tailings will also yield a 40-year supply of gravel, to be used for the annual spawning gravel injection program. (please refer to section 2.7.2 for further details) State in-kind contribution.	CDFW	0.00	n/a	0				\$15,000	\$15,000	
							<b>Sub-Total for Environmental Compliance, FY2014</b>					
							<b>Restoration Fund</b>	<b>Water and Related Resources</b>	<b>State Cash</b>	<b>State In-Kind</b>	<b>Total All Sources</b>	
							<i>Subtotal Funding</i>	\$75,000	\$0	\$0	\$15,000	\$90,000
							<i>Reclamation Service</i>	\$75,000	\$0			\$75,000
							<i>CA DFG</i>	\$0	\$0			\$0
							<i>CA DWR</i>			\$0	\$0	\$0

2.7		Construction/Implementation											
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(12) Requested Funding for Fiscal Year 2014						
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources		
2.7.1	Floodway 3B Project	Lower Clear Creek Floodway 3B Project. This is the final year of the project, and the majority of the work will focus on decommissioning access roads, work areas, and stabilizing/rehabilitating disturbed areas associated with project activities.	CDFW	0.00	Restore 2 miles of Stream Channel	0					\$100,000	\$100,000	
2.7.2	Mercury Abatement and Fish Restoration Project	Cloverview Mercury Abatement and Fisheries Restoration Project. The project will be implemented , with the removal of mining tailings, and rehabilitation of the mercury-laden sediments, thereby improving the water quality of Clear Creek. The project will yield up to 40 years supply of gravel for injecting into Clear Creek for purposes of creating spawning habitat. ERP grant.	CDFW	0.00	n/a	0					\$2,000,000	\$2,000,000	
2.7.3	Clear Creek Gravel Injection	Clear Creek Gravel Injections 2014. Inject 7,400 tons of spawning gravel at selected sites in Clear Creek. The gravel will create spawning habitat in Clear Creek and promote geomorphic processes.	BOR	0.00	Annually place 17,000 tons of spawning	Approximately 58.8% of the annual target	\$192,600					\$192,600	
2.7.4	Environmental Water Program	Implementation of the Environmental Water Program (EWP). The EWP program will release a experimental/pilot flow of 3,250 cfs from Whiskeytown Dam to help induce geomorphic processes in Clear Creek to promote maintenance of salmonid habitats for anadromous salmonids. CDFW grant to FWS.	CDFW	0.00	n/a	0				\$550,869		\$550,869	
							<b>Sub-Total for Construction/Implementation, FY2014</b>						
							<b>Restoration Fund</b>	<b>Water and Related Resources</b>	<b>State Cash</b>	<b>State In-Kind</b>	<b>Total All Sources</b>		
							\$192,600	\$0	\$550,869	\$2,100,000	\$2,843,469		
							<i>Reclamation Service</i>	\$192,600	\$0			\$192,600	
							<i>CA DFG</i>	\$0	\$0			\$0	
							<i>CA DWR</i>	\$0	\$0			\$0	

3.1		Land or Water Acquisition or Water Conveyance									
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(12) Requested Funding for Fiscal Year 2014				
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources
3.1.1	McConnell Foundation	McConnell Foundation Water Exchange/Pumping. When needed, reclamation will fund water pumping costs associated with the Saeltzer Dam removal. Dam removal impacted water deliveries and the replacement for the water required pumping that was not needed beforehand. The pumping costs to deliver the water are part of the costs of removing Saeltzer Dam. Reclamation funds the pumping costs only if pumping occurs; which does not occur in some years. Reclamation Contract 00-WC-20-1707 (H30-17416700-0019100; WO 346060)	BOR	0.00	n/a	0	\$5,000				\$5,000
							<b>Sub-Total for Acquisition or Conveyance, FY2014</b>				
							<b>Restoration Fund</b>	<b>Water and Related Resources</b>	<b>State Cash</b>	<b>State In-Kind</b>	<b>Total All Sources</b>
							\$5,000	\$0	\$0	\$0	\$5,000
							<i>Subtotal Funding</i>				
							<i>Reclamation</i>	\$5,000	\$0		\$5,000
							<i>Service</i>	\$0	\$0		\$0
							<i>CA DFG</i>			\$0	\$0
							<i>CA DWR</i>			\$0	\$0

4.1 Monitoring (Programmatic)											
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2014 Projected Performance	3406 (b)(12) 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	Biological Monitoring - Juvenile Spring Chinook	Juvenile Spring Chinook Salmon Monitoring Project. This project estimates the production of juvenile spring Chinook in Clear Creek, migration timing, and their biological condition. This work provides a means to evaluate the production of spring Chinook, population trends, and how restoration efforts are benefitting spring-run Chinook. (FRFR-4833 08 32CC 0W4 1)	FWS	0.00	n/a	0	\$112,951				\$112,951
4.1.2	Fall Chinook salmon area mapping	Fall Chinook salmon spawning area Mapping ("SAM") This work identifies changes in amount and distribution of spawning habitat, thereby providing a means to evaluate the effectiveness and benefits of spawning gravel injections for fall-run Chinook. (FRFR 4833 08 32CC 0W4 2)	FWS	0.00	Annually create 347,288 sq.ft. of	0	\$62,049				\$62,049
4.1.3	Spawning Gravel Evaluation	Clear Creek Spawning Gravel Evaluations. This work documents the quality and suitability of the spawning habitat for use by Clear Creek salmon and steelhead. This monitoring activity provides a means to evaluate the effectiveness of current gravel in achieving the desired size composition criteria and whether the criteria is resulting in suitable spawning habitat for adult salmonids in Clear Creek. The activity measures the amount of deleterious fine sediments that is deposited in spawning areas from erosion, fire-disturbed lands, and the inability of the system to transport the sediments due to shortage of high flow events. This evaluation provides an empirical means to adaptively manage the size criteria to suit restoration objectives, and complements activity 4.1.2 and 4.1.4. (FRFR 4833 08 32CC 0W4 3)	FWS	0.00	Annually create 347,288 sq.ft. of spawning habitat.	0	\$50,000				\$50,000
4.1.4	Conduct Geomorphic Monitoring in Clear Creek	Conduct Geomorphic Monitoring in Clear Creek - Evaluate effectiveness of Environmental Water Program (EWP) geomorphic pulse flows in Clear Creek. This on-going work would determine how the EWP flows are changing the physical characteristics of Clear Creek, and how these changes are benefitting anadromous salmonids	FWS	0.00	Annually create 347,288 sq.ft. of spawning	0	\$90,000				\$90,000
4.1.5	Spring Chinook and Steelhead Escapement	Perform spawning escapement surveys for Spring Chinook and steelhead to evaluate adult returns and spawning success in Clear Creek. This work monitors adult returns of spring Chinook and steelhead, and the reproductive success of these species. These species are federally listed as threatened, and enumerating the abundance of these fish in Clear Creek is a high biological and management priority, and serves as a means to evaluate the overall effectiveness of restoration actions in Clear Creek. This is a RPA funded activity.	FWS	0.00	n/a	0	\$324,951				\$324,951

4.1.6	Juvenile Monitoring of Salmonids in Clear Creek	This project estimates the production of juvenile Chinook and steelhead in Clear Creek. This activity in conjunction with the Juvenile Spring Chinook monitoring (4.1.1) allows 9 months of monitoring all juvenile salmonids produced in Clear Creek. The monitoring provides abundance and life history information of the juvenile salmonids, thereby a direct means to evaluate the response of salmonids to various restoration actions.	FWS	0.00	n/a	0	\$252,109				\$252,109	
4.1.7	Monitor EWP Pilot Flow Event	Conduct biological monitoring of the pilot EWP 3,250 cfs geomorphic flow event, to evaluate how the flow event is changing the physical habitats of Clear Creek, and this enables understanding of how the flow-induced changes benefit anadromous salmonids in Clear Creek. CDFW grant to FWS.	CDFW	0.00	n/a	0			\$100,000		\$100,000	
							<b>Sub-Total for Monitoring (Programmatic), FY2014</b>					
							<b>Restoration Fund</b>	<b>Water and Related Resources</b>	<b>State Cash</b>	<b>State In-Kind</b>	<b>Total All Sources</b>	
							<i>Subtotal Funding</i>	\$892,060	\$0	\$100,000	\$0	\$992,060
							<i>Reclamation</i>	\$0	\$0		\$0	
							<i>Service</i>	\$892,060	\$0		\$892,060	
							<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)(12), Clear Creek Restoration

	3406 (b)(12) Requested Funding For Fiscal Year 2015			
	Restoration Fund	Water and Related Resources	State Cash	Total All Sources
<b>Total</b>	\$950,000	\$350,000	\$2,048,000	\$3,348,000
<b>US Bureau of Reclamation</b>	\$343,000	\$350,000		\$693,000
<b>US Fish and Wildlife Service</b>	\$607,000	\$0		\$607,000
<b>California Dept of Fish and Wildlife</b>			\$2,036,000	\$2,036,000
<b>California Dept of Water Resources</b>			\$12,000	\$12,000

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	
<b>Program Mgmt &amp; Support</b>			\$15,000	\$106,000	\$125,000		\$16,000	\$12,000	\$274,000
<b>Project 1</b>	Cloverview Mercury Abatement	Cloverview Mercury Abate and Fisheries Restoration Project - implement process of historic mining tailings to remove mercury-laden sediments and stockpile spawning gravel.					\$2,000,000		\$2,000,000
<b>Project 2</b>	EWP NEPA/CEQA	Environmental Water Program - NEPA/CEQA planning for re-operation of Whiskeytown Dam to provide geomorphic flows seven times during a ten-year period.		\$80,000					\$80,000
<b>Project 3</b>	EWP NEPA/CEQA	Environmental Water Program - NEPA/CEQA planning for re-operation of Whiskeytown Dam to provide geomorphic flows seven times during a ten-year period. CDFW grant to FWS.					\$20,000		\$20,000



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	
<b>Project 4</b>	Clear Creek Gravel Injection	Inject 14,769 tons of spawning gravel in selected areas of Clear Creek	\$220,000	\$164,000					\$384,000
<b>Project 5</b>	McConnell Foundation	McConnell Foundation Water Exchange/Pumping. Fund pumping costs associated with the removal of Saeltzer-McCormick Dam.	\$15,000						\$15,000
<b>Project 6</b>	Juvenile Spring Chinook Monitoring	Juvenile spring Chinook monitoring project.			\$130,000				\$130,000
<b>Project 7</b>	Fall Chinook Salmon Spawning Area Mapping	Fall Chinook salmon spawning area mapping ("SAM"). Evaluate and map areas of Clear Creek utilized by fall-run Chinook for spawning.			\$75,000				\$75,000
<b>Project 8</b>	Spawning Gravel Evaluations	This work evaluates the effectiveness of the annual gravel injections, and identifies future areas of Clear Creek needing spawning gravel.			\$77,000				\$77,000
<b>Project 9</b>	Geomorphic Monitoring	Evaluate the effectiveness of EWP flows, and how changes are benefitting salmon and steelhead and aquatic habitats of Clear Creek. Activities are aerial photography (including LIDAR), sediment transport, effects of past fires, and longitudinal profiles.			\$125,000				\$125,000

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	
<b>Project 10</b>	Steelhead Evaluation and Monitoring	This activity evaluates steelhead population and habitat changes resulting from implementation of new CVPIA flow prescriptions. (RPA I.1.2 and RPA I.1.16 (Adaptively Manage to Habitat Suitability/IFIM study results)			\$75,000				\$75,000
<b>Project 11</b>	Environmental Monitoring	Regulatory Monitoring Requirements for various Restoration projects in Clear Creek.	\$65,000						\$65,000
<b>Project 12</b>	Environmental Permits	New Wetland Delineations and related Technical Services.	\$28,000						\$28,000

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)(12), Clear Creek Restoration

			3406 (b)(12) Requested Funding For Fiscal Year 2016						
			Restoration Fund	Water and Related Resources	State Cash	Total All Sources			
<b>Total</b>			\$600,000	\$350,000	\$528,000	\$1,478,000			
<b>US Bureau of Reclamation</b>			\$84,000	\$350,000		\$434,000			
<b>US Fish and Wildlife Service</b>			\$516,000	\$0		\$516,000			
<b>California Dept of Fish and Wildlife</b>					\$516,000	\$516,000			
<b>California Dept of Water Resources</b>					\$12,000	\$12,000			
			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 (\$)
<b>Program Mgmt &amp; Support</b>			\$15,000	\$105,000	\$125,000		\$16,000	\$12,000	\$273,000
<b>Project 1</b>	Cloverview Mercury Abatement	Cloverview Mercury Abate and Fisheries Restoration Project - Final year of processing historic mining tailings to remove mercury-laden sediments and stockpile spawning gravel; removal of equipment, decommission work sites, land stabilization, etc.					\$500,000		\$500,000
<b>Project 2</b>	EWP NEPA/CEQA	Environmental Water Program - NEPA/CEQA planning for re-operation of Whiskeytown Dam to provide geomorphic flows seven times during a ten-year period.		\$40,000					\$40,000
<b>Project 3</b>	Clear Creek Gravel Injection	Inject 7,925 tons of spawning gravel in selected areas of Clear Creek	\$54,000	\$160,000					\$214,000
<b>Project 4</b>	McConnell Foundation	McConnell Foundation Water Exchange/Pumping. Fund pumping costs associated with the removal of Saeltzer-McCormick Dam.	\$15,000						\$15,000

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	
<b>Project 5</b>	Juvenile Spring Chinook Monitoring	Juvenile spring Chinook monitoring project			\$128,000				\$128,000
<b>Project 6</b>	Fall Chinook Salmon Spawning Area Mapping	Fall Chinook salmon spawning area mapping ("SAM"). Evaluate and map areas of Clear Creek utilized by fall-run Chinook for spawning.			\$74,000				\$74,000
<b>Project 7</b>	Spawning Gravel Evaluations	This work evaluates the effectiveness of the annual gravel injections, and identifies future areas of Clear Creek needing spawning gravel.			\$75,000				\$75,000
<b>Project 8</b>	Geomorphic Monitoring	Evaluate the effectiveness of EWP flows, and how changes are benefitting salmon and steelhead and aquatic habitats of Clear Creek. Activities are aerial photography (including LIDAR), sediment transport, effects of past fires, and longitudinal profiles.			\$40,000				\$40,000
<b>Project 9</b>	Steelhead Evaluation and Monitoring	This activity evaluates steelhead population and habitat changes resulting from implementation of new CVPIA flow prescriptions (RPA I.1.2 and RPA I.1.16 (Adaptively Manage to Habitat Suitability/IFIM study results)			\$74,000				\$74,000
<b>Project 10</b>	Environmental Monitoring	Regulatory Monitoring Requirements for various Restoration projects in Clear Creek		\$45,000					\$45,000

**Table 3 – Proposed FY2014 CVPIA Clear Creek Fish Restoration Program Monitoring Projects**

<b>Project Description:</b>	<b>Clear Creek Restoration Monitoring Project</b> (Juvenile Spring Chinook Production Monitoring-Rotary Screw Trapping)
<b>FY 2013 Project Complete?</b>	This is an ongoing monitoring project.
<b>CVPIA annual work plan subtask number:</b>	Monitoring 4.1.1
<b>Scope of the monitoring effort:</b>	Clear Creek
<b>Product/deliverable:</b>	Annual Report
<b>Cost:</b>	\$112,951
<b>Questions posed:</b>	<ul style="list-style-type: none"> <li>• How many juvenile spring Chinook were produced in 2012?</li> <li>• What environmental factors and/or management actions affected juvenile production?</li> </ul>
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Produce annual report for 2014.</li> <li>• Collect salmonid monitoring data for 2014.</li> </ul>
<b>Results – expected or actual:</b>	Most juvenile spring Chinook leave the upper Clear Creek watershed as fry rather than at juvenile size.
<b>Data collection methods:</b>	Data will be collected using a rotary screw trap. Regular efficiency trials (10 to 20 per year) will be used to produce passage estimates. Data will be entered directly into an electronic database in the field.
<b>Data management:</b>	Final reports and data will be archived in the central computer system at the RBFWO.
<b>Assessment:</b>	Passage estimates will be analyzed relative to environmental variables, population parameters and restoration activity.
<b>Use of information in future decision making:</b>	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.

**Table 3 – Proposed FY2014 CVPIA Clear Creek Fish Restoration Program Monitoring Projects**

<b>Project Description:</b>	<b>Clear Creek Restoration Monitoring Project</b> (Fall Chinook Spawning Area Mapping “SAM”)
<b>FY 2013 Project Complete?</b>	This is an ongoing monitoring project.
<b>CVPIA annual work plan subtask number:</b>	Monitoring 4.1.2
<b>Scope of the monitoring effort:</b>	Clear Creek.
<b>Product/deliverable:</b>	Annual Report.
<b>Cost:</b>	•\$62,049
<b>Questions posed:</b>	<ul style="list-style-type: none"> <li>• Where are fall Chinook spawning?</li> <li>• How much area was used for spawning?</li> <li>• Are salmon using the spawning gravel or restored habitat provided by the program?</li> <li>• How effective is the program at increasing spawning habitat?</li> <li>• Where is additional restoration needed?</li> </ul>
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Describe the distribution and amount of spawning in relationship to restoration actions and document spatial and temporal changes.</li> <li>• Evaluate the effectiveness of spawning habitat restoration relative to restoration costs, adult escapement levels, and utilization by salmonids.</li> <li>• Document and evaluate environmental factors and restoration actions affecting salmonid spawning.</li> <li>• Provide recommendations for future habitat restoration.</li> </ul>
<b>Results – expected or actual:</b>	Spawning areas mapped in 2008 was greater than in all of the 8 previous years, suggesting that the program has been successful at creating new spawning habitat, and perhaps due to implementation of stream channel restoration Phase 3B. Our prediction that phase 3B would increase spawning habitat by 15% was accurate, as 16% of the spawning in the creek occurred in this reach in 2008 but less than 2% in the past.
<b>Data collection methods:</b>	Data will be collected using sub-foot accuracy GPS units to outline redd aggregates while in the field and directly importing them into GIS.
<b>Data management:</b>	Final reports and data are archived in the central computer system at the Red Bluff FWO.
<b>Assessment:</b>	<ul style="list-style-type: none"> <li>• Spawning area is summarized by both 1,000 foot reaches and by geomorphic-based reaches and compared between years, and between reaches.</li> <li>• Relationships between changes in spawning area and spawning escapement, redd counts, water temperature, stream flow, and restoration actions including spawning gravel supplementation are examined to evaluate success at the watershed and project levels.</li> </ul>

**Table 3 – Proposed FY2014 CVPIA Clear Creek Fish Restoration Program Monitoring Projects**

<b>Project Description:</b>	<b>Clear Creek Restoration Monitoring Project</b> (Fall Chinook Spawning Area Mapping “SAM”)
<b>Use of information in future decision making:</b>	<ul style="list-style-type: none"><li>• Information will be used in determining future stream flow requirements in NMFS OCAP BO Action I.1.2. “Channel Maintenance Flows”.</li><li>• Information will be used to improve the placement, particle size, and amount of supplemental spawning gravel used in NMFS OCAP BO Action I.1.3 “Spawning Gravel Addition”.</li><li>• Information will be used to evaluate ongoing benefits of restoration projects and applied to the planning and design of future projects.</li></ul>

**Table 3 – Proposed FY2014 CVPIA Clear Creek Fish Restoration Program Monitoring Projects**

<b>Project Description:</b>	<b>Clear Creek Restoration Monitoring Project</b> (Conduct Spawning Gravel Evaluations; potential spawning area mapping for spring Chinook and steelhead and gravel size analysis)
<b>FY 2013 Project Complete?</b>	This is an ongoing monitoring project.
<b>CVPIA annual work plan subtask number:</b>	Monitoring 4.1.3
<b>Scope of the monitoring effort:</b>	Clear Creek
<b>Product/deliverable:</b>	Annual Report.
<b>Cost:</b>	\$50,000
<b>Questions posed:</b>	<ul style="list-style-type: none"> <li>• How much spawning habitat is created through gravel augmentation?</li> <li>• How is gravel quality / size changing over time due to restoration or disturbance?</li> </ul>
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Map/document spawning areas for 2014.</li> <li>• Produce annual report for 2013.</li> <li>• Collect and evaluate data for 2014.</li> <li>• Estimate carrying capacity (i.e. number of spawning pairs supported) using mapping/area results.</li> </ul>
<b>Results – expected or actual:</b>	Spawning area may increase due to restoration (gravel placements) or decrease due to reductions in gravel placement.
<b>Data collection methods:</b>	a) Potential spawning areas will be surveyed using hand held high precision GPS instruments. b) bulk gravel samples will be collected from long-term monitoring sites and sieved for size analysis by Red Bluff FWO.
<b>Data management:</b>	Final reports and data will be archived in the central computer system at the Red Bluff FWO.
<b>Assessment:</b>	a) The amount of potential spawning habitat will be compared to the 347,000 sq. feet that existed before construction of Whiskeytown dam in the reach between Whiskeytown and McCormick Saeltzer dams, b) the amount of deleterious fine sediments and desirable coarse sediments will be compared to literature and watershed specific values to determine the need for erosion control or channel maintenance flows.
<b>Use of information in future decision making:</b>	Information is used to evaluate the benefits of habitat restoration, and flow and temperature management, to suggest future restoration actions, and to estimate carrying capacity which will be used to set overall program goals. In particular, a) the relationship between the amount of spawning gravel and the habitat created is used to estimate future needs and costs for spawning gravel and direct restoration actions. Identification of areas lacking spawning gravel will guide future gravel placements; and b) the percent of fine sediment will be used to determine the need for erosion control or channel maintenance flows and evaluate the success of these actions.



**Table 3 – Proposed FY2014 CVPIA Clear Creek Fish Restoration Program Monitoring Projects**

<b>Project Description:</b>	<b>Conduct Geomorphic Monitoring</b>
<b>FY 2013 Project Complete?</b>	Project was not funded in 2011, 2012, or 2013.
<b>CVPIA annual work plan subtask number:</b>	Monitoring 4.1.4
<b>Scope of the monitoring effort:</b>	Clear Creek
<b>Product/deliverable:</b>	Report
<b>Cost:</b>	\$90,000
<b>Questions posed:</b>	<ul style="list-style-type: none"> <li>• Do gravel injections alter the creek’s geomorphology in ways that benefit anadromous fish?</li> <li>• What level of maintenance flows are necessary to restore normative stream functions (e.g. gravel and sediment transport)?</li> <li>• What is the relationship between amount of gravel injected and amount of spawning habitat created?</li> </ul>
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Document and conduct redd mapping, and complete project report.</li> <li>• Assess effectiveness of spawning gravel injections at creating useable spawning habitat.</li> <li>• Quantify newly created spawning habitat and use by salmonids.</li> </ul>
<b>Results – expected or actual:</b>	<ul style="list-style-type: none"> <li>• Complete report</li> </ul>
<b>Data collection methods:</b>	<ul style="list-style-type: none"> <li>• Data collected in the field using topographic and visual surveys coupled with the FWS spawning survey data and mapping</li> </ul>
<b>Data management:</b>	Final report and data will be archived in the central computer system at Reclamation's NCAO and the FWS' Red Bluff FWO.
<b>Assessment:</b>	<ul style="list-style-type: none"> <li>• Monitoring conducted to verify increases in available spawning habitat and use by anadromous fish.</li> </ul>
<b>Use of information in future decision making:</b>	<ul style="list-style-type: none"> <li>• Information will assist in determining future gravel addition amounts, injection locations and injection methods. Project results will also influence future restoration efforts in Clear Creek.</li> </ul>

**Table 3 – Proposed FY2014 CVPIA Clear Creek Fish Restoration Program Monitoring Projects**

<b>Project Description:</b>	<b>Spring Chinook and Steelhead Spawning Escapement Surveys</b>
<b>FY 2013 Project Complete?</b>	This is an on-going project, funded through an interagency agreement between Bureau of Reclamation and Fish and Wildlife Service
<b>CVPIA annual work plan subtask number:</b>	Monitoring 4.1.5
<b>Scope of the monitoring effort:</b>	Clear Creek
<b>Product/deliverable:</b>	Report
<b>Cost:</b>	\$324,951
<b>Questions posed:</b>	<ul style="list-style-type: none"> <li>• Where in Clear Creek are spring Chinook and Steelhead spawning ?</li> <li>• How many redds are created by spring Chinook and steelhead?</li> <li>• What are the temporal trends in numbers and locations of redds?</li> <li>• What is the relationship between amount and location of gravel injected and the locations of redds created by spring Chinook and Steelhead?</li> <li>• What are the relationships between spawning and environmental factors such as time, water temperature, flows, and weather?</li> </ul>
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Document and conduct redd mapping, and complete project report.</li> <li>• Assess effectiveness of spawning gravel injections at creating useable spawning habitat.</li> <li>• Quantify newly created spawning habitat and use by salmonids.</li> </ul>
<b>Results – expected or actual:</b>	<ul style="list-style-type: none"> <li>• Complete report</li> </ul>
<b>Data collection methods:</b>	<ul style="list-style-type: none"> <li>• Data collected in the field visual surveys coupled with the FWS spawning survey data and mapping</li> </ul>
<b>Data management:</b>	Final report and data will be archived in the central computer system at Reclamation's NCAO and the FWS' Red Bluff FWO.
<b>Assessment:</b>	<ul style="list-style-type: none"> <li>• Monitoring conducted to verify increases in spawning by spring Chinook and steelhead, in relation to selected physical and environmental factors.</li> </ul>
<b>Use of information in future decision making:</b>	<ul style="list-style-type: none"> <li>• Evaluation of the spring Chinook and steelhead populations will assist in evaluating the effectiveness of the Clear Creek restoration Program. Project results will also influence future gravel and habitat restoration efforts in Clear Creek.</li> </ul>

**Table 3 – Proposed FY2014 CVPIA Clear Creek Fish Restoration Program Monitoring Projects**

<b>Project Description:</b>	<b>Juvenile Monitoring of Salmonids in Clear Creek</b>
<b>FY 2013 Project Complete?</b>	On-going project, funded through an interagency agreement between Bureau of Reclamation and Fish and Wildlife Service.
<b>CVPIA annual work plan subtask number:</b>	Monitoring 4.1.6
<b>Scope of the monitoring effort:</b>	Clear Creek
<b>Product/deliverable:</b>	Report
<b>Cost:</b>	\$252,109
<b>Questions posed:</b>	<ul style="list-style-type: none"> <li>• How many fall-run Chinook were produced in 2014?</li> <li>• How many late fall-run Chinook were produced in 2014?</li> <li>• How many steelhead were produced in 2014?</li> <li>• What environmental factors and/or management actions affected juvenile production?</li> </ul>
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Produce annual report for 2014.</li> <li>• Collect salmonid monitoring data for 2014.</li> </ul>
<b>Results – expected or actual:</b>	<ul style="list-style-type: none"> <li>• This activity will allow year-round monitoring of all juvenile salmonids in Clear Creek, in conjunction with the 4.1.1 activity which is seasonal only for spring Chinook.</li> </ul>
<b>Data collection methods:</b>	<ul style="list-style-type: none"> <li>• Data will be collected using rotary screw traps. Regular efficiency trails (10 to 20) will be used to produce passage estimates. Data will be entered directly into an electronic database in the field.</li> </ul>
<b>Data management:</b>	Final report and data will be archived in the central computer system at Reclamation's NCAO and the FWS' Red Bluff FWO.
<b>Assessment:</b>	<ul style="list-style-type: none"> <li>• Passage estimates will be analysed relative to environmental variables, population parameters and restoration activities.</li> </ul>
<b>Use of information in future decision making:</b>	<ul style="list-style-type: none"> <li>• 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.</li> </ul>