

Draft CVPIA Fiscal Year 2015 Annual Work Plan, Clear Creek Restoration, CVPIA Section 3406 (b)(12)

Responsible Entities:

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The U. S. Fish and Wildlife Service (USFWS) and the Bureau of Reclamation (Reclamation) jointly implement the Clear Creek Restoration Program (Program), with the California Department of Fish and Wildlife (CDFW), and California Department of Water Resources as the acting as the state partners. The Central Valley Project Improvement Act implements Section 3406 (b)(12) which directs and authorizes the Secretary of the Interior 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 non-reimbursable 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 impellent a program that makes all reasonable efforts to double natural production of anadromous fish in Central Valley streams (Section 3406 (b1)(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.

Program Goals and Objectives for FY 2015:

The (b)(12) Program (program) goals are:

1. Provide flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead.
2. Restore the stream channel and associated instream habitat.
3. Determine impacts of restoration actions on anadromous fish and geomorphology.

To achieve these goals, the program addressed the following:

1. Flows and temperatures are 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.

Additionally, monitoring results are coordinated 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, the Sacramento River Temperature Task Group and Reclamation's Central Valley Operations group, to guide adaptive flow management and evaluate results.

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

2. The program will restore a 2 mile section of Clear Creek floodplain and stream channel degraded by aggregate and gold mining, dams and diversions, 2) annually injects 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 site, and 4) reduce fine sediments through erosion control, mechanical removal and channel maintenance flows.

The program has coordinated with federal and state partners to develop the Lower Clear Creek Aquatic Habitat and Mercury Project (aka Clear Creek

Long-Term Gravel Supply Project). This project will reclaim historic mining tailings which contains sediments with elemental mercury. The sediment will be separated from the tailings and properly disposed, which will result in a 40-year supply of spawning gravel which will be used for augmenting gravel in Clear Creek.

The Lower Clear Creek Floodway Restoration Project, Phase 3B, has revegetated and restored floodplain; rerouted and decommissioned roads used for restoration, and developed scour channels that reduce salmonid stranding.

3. Conducted fishery and geomorphic monitoring at levels necessary to ascertain project effects on fishery and geomorphic resources. These are annual activities.

Adult spring and late-fall Chinook and steelhead population estimates are made through snorkel and kayak based stream surveys. Although the spring-run population numbers had been in decline, the numbers of spring-run Chinook increased from 8 in 2011 to 68 in 2012, and 652 in 2013, the highest since monitoring efforts began in 1998. Steelhead redd numbers have been gradually increasing in the last 11 years from about 100 to 406 in 2014.

Juvenile salmonid monitoring uses rotary screw trapping to estimate spring Chinook production; this activity assesses whether CVPIA goals are being met.

The spawning area mapping work evaluates the benefit of restoration actions (habitat improvement, spawning gravel augmentation, channel maintenance flows, and segregation weir operation) on fall Chinook.

Spawning habitat suitability mapping evaluates the benefit of restoration actions (habitat improvements, spawning gravel augmentation and channel maintenance flows,) on spring Chinook.

The program has an on-going evaluation of gravel size-distributions to determine the effectiveness of gravel additions in providing suitable spawning habitat for salmonids. This effort also evaluates the effectiveness of pulse flows in the mobilization and redistribution of gravel.

Geomorphic monitoring documents 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.

Status of the Program:

Since 1994, the (b)(12) Program has addressed three of the six “Action Items” and completed the one sole “Evaluation” which are identified in the AFRP’s Final Restoration Plan.

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 not been met in most recent years. This target was not been met in 2009 through 2012. In 2013, water temperature targets were met 99% of the time due to the large amount of water brought over from the Trinity River through Whiskeytown Reservoir. The 60°F target from June 1 through September 14 was achieved 100% of the time and the 56°F target from September 15 to October 31 was met 96% of the time

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 2014.

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, 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.

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, 2012, and 2013. 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 occurred in June. 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. The pulse flows conducted in Clear Creek are beneficial in attracting fish and promoting upstream movement. In the spring of 2013, two pulse flows were provided to help attract spring-run Chinook to Clear Creek. Pre- and post-flow event surveys conducted by FWS indicate that the pulse flows were successful in attracting adult fish; the data is currently undergoing finalization. The strong return of Spring Chinook in 2013 and their response, particularly to the second pulse event (400 pre-pulse, 561 post-pulse; 40% increase) provided an objective means to demonstrate the importance of pulse flow events in benefitting upstream movement. 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 2015. 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 revegetated floodplain habitat and reduced most of the potential for fish stranding in the project areas. ERP provides funding for Phase 3B, with roadwork underway during FY 2013, and riparian stabilization work currently scheduled for implementation in FY 2014. Future implementation of Phase 3C would create floodplain and stream channels in the lowest part of the reach. Ongoing 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 planning efforts in FY 2015.

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 2013, a total of approximately 172,335 tons of spawning gravel was added to the creek. In 2012, a total of 9,974 tons of gravel were placed at four sites: Guardian Rock site, Placer Bridge, Clear Creek Road Crossing, and at Tule Backwater. The 9,974 tons is 39.9% of the CPAR annual goal. The programs' annual spawning gravel addition target is 25,000 tons per year, but only an average of 9,574 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.

Lower Clear Creek Aquatic Habitat and Mercury Abatement Project

CVPIA has provided funding for the design and permitting of projects on BLM and CDFW 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. This project is pending state funding from the Ecological Restoration Program (ERP). 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, the 1,038 acre Dale 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 posed a high concern to enter Clear 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. In 2013, another major fire (Clover Fire) broke out which

affected a portion of the Clear Creek drainage. The impacts from these fires may not be fully known or realized until we have years of high precipitation.

For more information, see the following website:

<http://www.usbr.gov/mp/cvpia/>