

Draft CVPIA Fiscal Year 2012 Annual Work Plan

December 9, 2011

Program Title:

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

Responsible Entities:

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

Program Goals and Objectives for FY 2012

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

Objectives: 1) provide available habitat that is at least 90 percent of the maximum possible weighted usable area, 2) do not exceed Igo gauge water temperature criteria including 60°F from June 1 through September 15, and 56°F from September 15 through October 31, and 3) provide passage allowing at least 70 percent of adult anadromous fish to pass into upstream areas.

Task 1.4.1 – Assist Environmental Water Program (EWP) with Channel Maintenance Flows required by NMFS OCAP BO RPA Action I.1.2.

Task 1.13.1- Conduct instream flow study to determine long-term needs for anadromous salmonids.

Task 1.14.1 - Provide funding for wheeling water through the Bella Vista Water District.

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

Objectives: 1) restore 2 mile section of Clear Creek degraded by aggregate and gold mining, 2) annually inject 25,000 tons of spawning gravel to recharge system, and 3) reduce fine sediments through erosion control and mechanical removal.

Task 1.4.2 - Add 10,000 tons of spawning gravel at 5 sites to provide 39 percent of program goal (25,000 tons annually; CPAR goal) to increase usable spawning habitat for salmonids.

Goal C – Determine impacts of restoration actions on anadromous fishery and geomorphology.

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

Task 1.12.1 - Conduct adult and juvenile salmonid monitoring using rotary screw trapping, walking surveys and other techniques.

Task 1.12.2 - Conduct geomorphic monitoring to monitor effectiveness of program.

Supporting documents

1) CVPIA Section 3406 (b)(12); 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 required by 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).

Flows

Interim 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 mid September through mid June and approximately 70 to 90 cfs during the summer for temperature control. This interim 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, and two reports have been completed, one report is scheduled for completion by the end of September 2011, and the fourth report is scheduled for completion by the end of FY 2012. These reports address different segments of the creek, along with different life stages of anadromous salmonids that are found on Clear Creek.

In 2011, 3 IFIM reports will be finalized after peer review. Work will continue on bio-validation of the models. The 23 IFIM flow-habitat models (refer to Appendices) will be synthesized with population, temperature, and restoration information to provide flow prescriptions that optimize habitat needs for all species, runs and life stages of salmonids in the different reaches of the creek, throughout the year. The different models are for the flow-habitat relationship for each life stage (spawning, fry and juvenile), for each species/race (fall-run, spring-run and steelhead) and by stream segment (upper alluvial, canyon, and lower alluvial). The caveat is that only the upper alluvial and canyon segments are for spring-run spawning, and fall-run for all three life stages are only for the lower alluvial segment. Alternative flow prescriptions would then be compared and a new long-term flow schedule will be proposed to NMFS under terms of the OCAP BO. The flow prescriptions should be completed in 2012.

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, 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.

McCormick-Saeltzer Dam Passage

McCormick-Saeltzer Dam was removed in the fall of 2000. Passage of spring-run Chinook has increased from 0 to 70 percent allowing for establishment of a new population of this threatened species. Stream surveys and juvenile monitoring results also suggest that dam removal is allowing re-establishment of spring-run Chinook as well as a new population of threatened Central Valley steelhead.

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. Phase 3C, the last phase of the project, is currently being considered for design and permitting, for potential implementation in future years. On-going analyses are expected to result in final recommendations by FY 2012.

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 provide 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 2009, a total of approximately 130,925 tons of spawning gravel was added to the creek. The programs' annual spawning gravel addition target is 25,000 tons per year, but only an average of 9,358 tons has been placed annually since 1996 due to insufficient funding.

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. It is highly likely that these projects will be funded by CALFED's Ecological Restoration Program using state funds in 2012. Pre- and post-project monitoring to evaluate the success of the project will serve as a basis for justifying increased funding for future and continued restoration activities in Clear Creek.

Erosion Control

In 2008, catastrophic wildfire burned significant portions of the Clear Creek watershed resulting in fire line building, road building and salvage logging. In 2009 and 2010, 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.

Adaptive Management

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 2012. 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 what mechanism.

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 experimentation with higher flows in 2011 which were successful in achieving higher flows, and moving more sediment downstream. Sediment transport monitoring suggested that some flow levels were more effective at removing accumulations of sand and therefore demonstrated the utility of pulse flows.

Spawning studies conducted by FWS suggested that some spawning gravel projects implemented in 2009 performed better at certain sites than others. These results were used to improve projects conducted in 2011 and to prioritize sites for spawning gravel augmentation in 2012.

On-going juvenile salmon rearing studies suggest that while Stream Channel Restoration Project Phase 3A continues to perform well, Phase 3B is not performing as well as the control sites. *CVPIA results* reported were used to design habitat improvements implemented in Phase 3B during summer 2011, with Bureau of Land Management funds. These improvements will not be monitored in 2012 due to insufficient funding.

As in October 2009, a series of unusual storms in October 2010 eventually overtopped and compromised the segregation weir used to protect spring Chinook from hybridization and competition with fall Chinook. Climate change models predict increases in these early season storms. The use of an alternative type of weir that is less susceptible to high flows is being considered, and which would also meet some of the needs required in the CVP OCAP monitoring actions on Clear Creek. The DFG Steelhead Monitoring Plan and draft Chinook monitoring plan also recommended a weir of this type for Clear Creek.

Monitoring results were reported to the Clear Creek Technical Team during five regularly scheduled meetings, and in annual reports. This information was used in budget and project planning and the design of restoration projects. The majority of Clear Creek monitoring in the past years was performed

using state CALFED funds; these funds are not available in FY2012. Funding through CVPIA will be sought to support some of the monitoring activities. Other monitoring work may cease in 2012.

FY 2011 Accomplishments

Flows

Base flows of 200 cfs between October 1 and May 31 were achieved. Flows to achieve temperature control of 60°F from June 1 through September 15 2009 and 56°F from September 15 through October 31. 2010 met the target 77% of the time. All of the exceedances occurred during the 56°F spawning and incubation period when the target was met only 26% of the time. Two pulse flows were provided during the spring 2011 to attract spring Chinook into Clear Creek. Similar flows will occur each year as directed by the NMFS OCAP BO.

The IFIM study, being conducted by the FWS, completed a report on fall-run Chinook salmon spawning study sites in the lower reach of Clear Creek and a report on fall-run Chinook salmon juvenile rearing study sites in the lower reach of Clear Creek. Additional details are in *Appendices*.

Environmental Water Program

In 2008, FWS and the CALFED EWP entered into a contract to provide a pilot re-operation of Whiskeytown reservoir to achieve the channel maintenance flow prescription outlined in Status of the Program section. Contracts with FWS and subcontracts with Reclamation's Denver Technical Service Center, ESSA Ltd, Graham Matthew and Associates, and Stillwater Sciences were developed and finalized. In FY 2011, ESSA began preparations for the first workshop, scheduled for October 2011, to take place in Sacramento, CA. The workshop will 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 will collaborate together to identify data gaps and uncertainties, understanding operational tools, identifying resources needed, ensuring safety-of-dams considerations, and mitigating for foregone power revenues.

Spawning Gravel Supplementation

Long-term environmental permits for spawning gravel addition projects continue to be prepared with completion anticipated in 2012.

Permits and designs continue to be prepared for the Long-term Spawning Gravel Supply Project. Concept and final funding proposals were submitted to CALFED for both the DFG portion of the project and larger portion of the project which will occur on BLM land.

In 2011, ten thousand tons of gravel was placed at five sites: Below Whiskeytown Dam, below Dog Gulch Creek, above Peltier Bridge, Paige Bar Below NEED Camp(Guardian Rock site). The 10,000 tons is 40% of the CPAR annual goal.

The second annual evaluation of spawning gravel implementation and monitoring was submitted to NMFS as a requirement under the OCAP BO. Studies in 2011 suggested that gravel sizes specifications should be modified in future years to improve use by spring Chinook.

Monitoring

Monitoring continues to document the overall success of the project. In 2010, fall-run Chinook escapement was 7,192 compared to the average baseline escapement of 1,689 between 1967 and 1991. The 2010 fall Chinook escapement was 51% of the average post-CVPIA (1992 to 2008) escapement. In the past four years, the Central Valley fall Chinook fishery has collapsed, however, the no other Central Valley watershed has survived the collapse as well as Clear Creek.

In 2011, the adult spring-run Chinook index was 7. Subsequent spawning ground surveys suggest that although the index was unusually underestimated, it represented the lowest return since 2001. There are no clear explanations for this low return year. Adult steelhead populations also continue to increase, as indicated from redd counts, increasing from 38 in 2001 to 217 in 2011. Steelhead counts were 44% greater than the ten-year average.

Appendices

Clear Creek IFIM studies: : A two-dimensional model, River2D Version 0.93 November 11, 2006 by P. Steffler, A. Ghanem, J. Blackburn and Z. Yang (Steffler and Blackburn 2002) was used for predicting Weighted Useable Area (WUA), instead of the Physical Habitat Simulation (PHABSIM3) component of IFIM. River2D inputs include the bed topography and bed roughness, and the water surface elevation at the downstream end of the site. The amount of habitat present in the site is computed using the depths and velocities predicted by River2D, another model used in the analysis, and the substrate and cover present in the site.

Table 1. FY2012 Activities and Costs

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| | CVPIA Section: 3406 (b)(12) |
| | CVPIA Program: Clear Creek Restoration |

| | 2012 Requested Funding | | | | | |
|----------------------|------------------------|---------------|------------------|-----------------------------|----------------|-------------------|
| | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| Total Funding | \$4,539,015 | \$34,000 | \$800,000 | \$105,000 | \$0 | \$5,478,015 |
| <i>Reclamation</i> | | | \$420,177 | \$105,000 | \$0 | \$5,064,192 |
| <i>Service</i> | | | \$379,823 | \$0 | \$0 | \$379,823 |
| <i>CA DFG</i> | \$4,539,015 | \$30,000 | | | \$0 | \$4,569,015 |
| <i>CA DWR</i> | \$0 | \$4,000 | | | \$0 | \$4,000 |
| <i>Other</i> | \$0 | \$0 | | | \$0 | \$0 |

| AWP Activity Number | Type of Activity | # of FTE's | Activity Name & Description | Agency | NMFS OCAP RPA# | Performance Metric | Performance Target | 2012 Requested Funding | | | | | |
|---------------------|---------------------------|------------|---|--------|----------------|--------------------|--------------------|-------------------------|---------------|------------------|-----------------------------|----------------|-------------------|
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| 1.1 | Program Management | | | | | | | | | | | | |
| 1.1.1 | | 0.45 | Tom Kisanuki (Reclamation- Overall program management, budget, prepare and oversee contracts) | BOR | - | - | | \$0 | \$0 | \$0 | \$80,000 | \$0 | \$80,000 |
| 1.1.2 | | 0.45 | Matt Brown- (FWS Overall program management, budget, conducts monitoring) | FWS | - | - | - | \$0 | \$0 | \$80,000 | \$0 | \$0 | \$80,000 |
| 1.1.3 | | 0.02 | R8 Program Administration contribution | FWS | - | - | - | \$0 | \$0 | \$4,823 | \$0 | \$0 | \$4,823 |
| | | | | | | | | Anticipated Funding | | | | | |
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| | | | | | | | | \$0 | \$0 | \$84,823 | \$80,000 | \$0 | \$164,823 |
| | | | | | | | | Subtotal Funding | | | | | |
| | | | | | | | | <i>Reclamation</i> | | | | | |
| | | | | | | | | <i>Service</i> | | | | | |
| | | | | | | | | <i>CA DFG</i> | | | | | |
| | | | | | | | | <i>CA DWR</i> | | | | | |
| | | | | | | | | <i>Other*</i> | | | | | |

* List other funding source here: None

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| CVPIA Section: 3406 (b)(12) |
| CVPIA Program: Clear Creek Restoration |

| | 2012 Requested Funding | | | | | |
|----------------------|------------------------|---------------|------------------|-----------------------------|----------------|-------------------|
| | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| Total Funding | \$4,539,015 | \$34,000 | \$800,000 | \$105,000 | \$0 | \$5,478,015 |
| <i>Reclamation</i> | | | \$420,177 | \$105,000 | \$0 | \$5,064,192 |
| <i>Service</i> | | | \$379,823 | \$0 | \$0 | \$379,823 |
| <i>CA DFG</i> | \$4,539,015 | \$30,000 | | | \$0 | \$4,569,015 |
| <i>CA DWR</i> | \$0 | \$4,000 | | | \$0 | \$4,000 |
| <i>Other</i> | \$0 | \$0 | | | \$0 | \$0 |

| AWP Activity Number | Type of Activity | # of FTE's | Activity Name & Description | Agency | NMFS OCAP RPA# | Performance Metric | Performance Target | 2012 Requested Funding | | | | | |
|--|------------------------|---|-----------------------------|--------|----------------|--------------------|--------------------|------------------------|---------------|------------------|-----------------------------|-------------------------|-------------------|
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| 1.2 | Program Support | | | | | | | | | | | | |
| 1.2.1 | 0.10 | Habitat restoration coordinator partially funded by AFRP, develops and reviews proposals for restoration. | | CDFG | - | - | | \$0 | \$15,000 | \$0 | \$0 | \$0 | \$15,000 |
| 1.2.2 | 0.01 | Reviews state cost share agreements- any other roles anticipated? | | CDWR | - | - | | \$0 | \$4,000 | \$0 | \$0 | \$0 | \$4,000 |
| | | | | | | | | Anticipated Funding | | | | | |
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | State or Other Sources* | Total All Sources |
| Subtotal Funding | | | | | | | | \$0 | \$19,000 | \$0 | \$0 | \$0 | \$19,000 |
| <i>Reclamation</i> | | | | | | | | | | \$0 | \$0 | \$0 | \$0 |
| <i>Service</i> | | | | | | | | | | \$0 | \$0 | \$0 | \$0 |
| <i>CA DFG</i> | | | | | | | | \$0 | \$15,000 | | | \$0 | \$15,000 |
| <i>CA DWR</i> | | | | | | | | \$0 | \$4,000 | | | \$0 | \$4,000 |
| <i>Other*</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |
| * List other funding source here: None | | | | | | | | | | | | | |

| AWP Activity Number | Type of Activity | # of FTE's | Activity Name & Description | Agency | NMFS OCAP RPA# | Performance Metric | Performance Target | 2012 Requested Funding | | | | | |
|--|--------------------------|---|-----------------------------|--------|----------------|--------------------|--------------------|------------------------|---------------|------------------|-----------------------------|-------------------------|-------------------|
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| 1.3 | Technical Support | | | | | | | | | | | | |
| 1.3.1 | 0.20 | Technical support on B(2) flow subjects, coordination with Central Valley Operations staff, and technical assistance to the EWP and Clear Creek Technical Team functions. | | FWS | - | - | | \$0 | \$0 | \$30,000 | \$0 | \$0 | \$30,000 |
| 1.3.2 | 0.10 | Technical support to Clear Creek Technical Team | | CDFG | - | - | | \$0 | \$15,000 | \$0 | \$0 | \$0 | \$15,000 |
| | | | | | | | | Anticipated Funding | | | | | |
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | State or Other Sources* | Total All Sources |
| Subtotal Funding | | | | | | | | \$0 | \$15,000 | \$0 | \$0 | \$0 | \$15,000 |
| <i>Reclamation</i> | | | | | | | | | | \$0 | \$0 | \$0 | \$0 |
| <i>Service</i> | | | | | | | | | | \$0 | \$0 | \$0 | \$0 |
| <i>CA DFG</i> | | | | | | | | \$0 | \$15,000 | | | \$0 | \$15,000 |
| <i>CA DWR</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |
| <i>Other*</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |
| * List other funding source here: None | | | | | | | | | | | | | |

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| CVPIA Section: 3406 (b)(12) |
| CVPIA Program: Clear Creek Restoration |

| | 2012 Requested Funding | | | | | |
|----------------------|------------------------|---------------|------------------|-----------------------------|----------------|-------------------|
| | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| Total Funding | \$4,539,015 | \$34,000 | \$800,000 | \$105,000 | \$0 | \$5,478,015 |
| <i>Reclamation</i> | | | \$420,177 | \$105,000 | \$0 | \$5,064,192 |
| <i>Service</i> | | | \$379,823 | \$0 | \$0 | \$379,823 |
| <i>CA DFG</i> | \$4,539,015 | \$30,000 | | | \$0 | \$4,569,015 |
| <i>CA DWR</i> | \$0 | \$4,000 | | | \$0 | \$4,000 |
| <i>Other</i> | \$0 | \$0 | | | \$0 | \$0 |

| AWP Activity Number | Type of Activity | # of FTE's | Activity Name & Description | Agency | NMFS OCAP RPA# | Performance Metric | Performance Target | 2012 Requested Funding | | | | | |
|-------------------------|----------------------------|------------|---|--------|----------------|--|--------------------|----------------------------|----------------------|-------------------------|------------------------------------|--------------------------------|--------------------------|
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| 1.4 | Restoration Actions | | | | | | | | | | | | |
| 1.4.1 | | 0.23 | Assist Environmental Water Program with channel maintenance flows. Permitting of channel maintenance releases from Whiskeytown Dam. AFRP Final Restoration Plan Clear Creek action #8. Fall-run (FCS), late-fall-run (LFC), spring-run Chinook (SCS) and steelhead (STT) benefit. High priority to create and maintain habitat for anadromous fish. Non-structural action improving 18.1 miles of stream habitat. \$810,000 of Other Funding is a FWS contract from CALFED. | FWS | I.1.2 | b12:Variable flow target | Variable | \$267,075 | \$0 | \$50,000 | \$0 | \$0 | \$860,000 |
| 1.4.2 | | - | Spawning gravel injections contracted by Reclamation. AFRP Final Restoration Plan Clear Creek action #5. Fall-run (FCS), late-fall-run (LFC), spring-run Chinook (SCS) and steelhead (STT) benefit. High priority to create and maintain habitat for anadromous fish. Non-structural action improving 18.1 miles of stream habitat. Ten thousand tons injected at four sites representing 39 percent of CPAR/PART goal. | | I.1.3 | b12:Spawning gravel placed annually (tons) | 17,000 | \$0 | \$0 | \$240,265 | \$0 | \$0 | \$240,177 |
| 1.4.3 | | - | Long term spawning gravel supply project implementation on BLM and DFG prpoerties contracted by Reclamation. AFRP plan Clear Creek action #5. FCS, LFC, and SCS and STT benefit. High priority to provide inexpensive source of spaning gravel for habitat restoration. Non structural action to benefit 18.1 miles of stream. | | I.1.3 | b12:Spawning gravel placed annually (tons) | 17,000 | \$2,440,000 | \$0 | \$0 | \$0 | \$0 | \$0 |
| | | | | | | | | Anticipated Funding | | | | | |
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | State or Other Sources* | Total All Sources |
| Subtotal Funding | | | | | | | | \$3,253,745 | \$0 | \$290,265 | \$0 | \$0 | \$3,544,010 |
| <i>Reclamation</i> | | | | | | | | | | \$0 | \$0 | \$0 | \$0 |
| <i>Service</i> | | | | | | | | | | \$50,000 | \$0 | \$0 | \$50,000 |
| <i>CA DFG</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |
| <i>CA DWR</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |
| <i>Other*</i> | | | | | | | | \$3,250,000 | \$0 | | | \$0 | \$3,250,000 |

* List other funding source here: None

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| CVPIA Section: 3406 (b)(12) |
| CVPIA Program: Clear Creek Restoration |

| | 2012 Requested Funding | | | | | |
|----------------------|------------------------|---------------|------------------|-----------------------------|----------------|-------------------|
| | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| Total Funding | \$4,539,015 | \$34,000 | \$800,000 | \$105,000 | \$0 | \$5,478,015 |
| <i>Reclamation</i> | | | \$420,177 | \$105,000 | \$0 | \$5,064,192 |
| <i>Service</i> | | | \$379,823 | \$0 | \$0 | \$379,823 |
| <i>CA DFG</i> | \$4,539,015 | \$30,000 | | | \$0 | \$4,569,015 |
| <i>CA DWR</i> | \$0 | \$4,000 | | | \$0 | \$4,000 |
| <i>Other</i> | \$0 | \$0 | | | \$0 | \$0 |

| AWP Activity Number | Type of Activity | # of FTE's | Activity Name & Description | Agency | NMFS OCAP RPA# | Performance Metric | Performance Target | 2012 Requested Funding | | | | | |
|-------------------------|-------------------|------------|--|--------|----------------|--|--------------------|------------------------|---------------|------------------|-----------------------------|-------------------------|-------------------|
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| 1.12 | Monitoring | | | | | | | | | | | | |
| 1.12.1 | - | | FWS RBFWO will estimate production of juvenile spring Chinook with a rotary screw trap, estimate the amount of fall Chinook spawning habitat, estimate the amount of potential spring Chinook spawning habitat and evaluate spawning gravel quality through bulk sediment sampling. AFRP Final Restoration Plan Clear Creek actions 10, 14, 15, 16 and evaluation #1. Fall-run (FCS), late-fall-run (LFC), spring-run Chinook (SCS) and steelhead (STT) benefit. High priority for adaptive management of flows and restoration actions. Non-structural action improving 18.1 miles of stream habitat. | FWS | I.1 | - | | \$0 | \$0 | \$225,000 | \$0 | \$0 | \$225,000 |
| 1.12.2 | - | | Reclamation will contract for geomorphic studies to monitor effectiveness of program, and changes in salmonid habitat due to restoration projects and operation of Whiskeytown Reservoir. AFRP Final Restoration Plan Clear Creek action #14. Fall-run (FCS), late-fall-run (LFC), spring-run Chinook (SCS) and steelhead (STT) benefit. High priority for adaptive management of flows and restoration actions. Non-structural action improving 18.1 miles of stream habitat. | BOR | I.1.3 | b12:Spawning gravel placed annually (tons) | 17,000 | \$0 | \$0 | \$180,000 | \$0 | \$0 | \$180,000 |
| | | | | | | | | Anticipated Funding | | | | | |
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | State or Other Sources* | Total All Sources |
| Subtotal Funding | | | | | | | | \$0 | \$0 | \$405,000 | \$0 | \$0 | \$405,000 |
| <i>Reclamation</i> | | | | | | | | | | \$180,000 | \$0 | \$0 | \$180,000 |
| <i>Service</i> | | | | | | | | | | \$225,000 | \$0 | \$0 | \$225,000 |
| <i>CA DFG</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |
| <i>CA DWR</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |
| <i>Other*</i> | | | | | | | | \$0 | \$0 | | | \$0 | \$0 |

* List other funding source here: None

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| CVPIA Section: 3406 (b)(12) |
| CVPIA Program: Clear Creek Restoration |

| | 2012 Requested Funding | | | | | |
|----------------------|------------------------|---------------|------------------|-----------------------------|----------------|-------------------|
| | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| Total Funding | \$4,539,015 | \$34,000 | \$800,000 | \$105,000 | \$0 | \$5,478,015 |
| <i>Reclamation</i> | | | \$420,177 | \$105,000 | \$0 | \$5,064,192 |
| <i>Service</i> | | | \$379,823 | \$0 | \$0 | \$379,823 |
| <i>CA DFG</i> | \$4,539,015 | \$30,000 | | | \$0 | \$4,569,015 |
| <i>CA DWR</i> | \$0 | \$4,000 | | | \$0 | \$4,000 |
| <i>Other</i> | \$0 | \$0 | | | \$0 | \$0 |

| AWP Activity Number | Type of Activity | # of FTE's | Activity Name & Description | Agency | NMFS OCAP RPA# | Performance Metric | Performance Target | 2012 Requested Funding | | | | | |
|---------------------|------------------|------------|---|--------|----------------|--------------------------|--------------------|------------------------|---------------|------------------|-----------------------------|-------------------------|-------------------|
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| 1.13 | Modeling | | | | | | | | | | | | |
| 1.13.1 | | 0.10 | FWS Sacramento Field Office will conduct IFIM studies to determine long-term instream flow needs. AFRP Final Restoration Plan Clear Creek action # 11. Fall-run (FCS), late-fall-run (LFC), spring-run Chinook (SCS) and steelhead (STT) benefit. High priority for establishing long-term flow schedule. Non-structural action improving 18.1 miles of stream habitat. | FWS | 1.1.6 | b12:Variable flow target | Variable | \$0 | \$0 | \$20,000 | \$0 | \$0 | \$20,000 |
| | | | | | | | | Anticipated Funding | | | | | |
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | State or Other Sources* | Total All Sources |
| | | | | | | | | \$0 | \$0 | \$20,000 | \$0 | \$0 | \$20,000 |
| | | | | | | | | <i>Reclamation</i> | | | \$0 | \$0 | \$0 |
| | | | | | | | | <i>Service</i> | | | \$20,000 | \$0 | \$20,000 |
| | | | | | | | | <i>CA DFG</i> | \$0 | \$0 | | | \$0 |
| | | | | | | | | <i>CA DWR</i> | \$0 | \$0 | | | \$0 |
| | | | | | | | | <i>Other*</i> | \$0 | \$0 | | | \$0 |

* List other funding source here: Funding source would be ERP .

| | |
|--|--|
| | CVPIA Section: 3406 (b)(12) |
| | CVPIA Program: Clear Creek Restoration |

| | 2012 Requested Funding | | | | | |
|----------------------|------------------------|---------------|------------------|-----------------------------|----------------|-------------------|
| | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources |
| <i>Total Funding</i> | \$4,539,015 | \$34,000 | \$800,000 | \$105,000 | \$0 | \$5,478,015 |
| <i>Reclamation</i> | | | \$420,177 | \$105,000 | \$0 | \$5,064,192 |
| <i>Service</i> | | | \$379,823 | \$0 | \$0 | \$379,823 |
| <i>CA DFG</i> | \$4,539,015 | \$30,000 | | | \$0 | \$4,569,015 |
| <i>CA DWR</i> | \$0 | \$4,000 | | | \$0 | \$4,000 |
| <i>Other</i> | \$0 | \$0 | | | \$0 | \$0 |

| AWP Activity Number | Type of Activity | # of FTE's | Activity Name & Description | Agency | NMFS OCAP RPA# | Performance Metric | Performance Target | 2012 Requested Funding | | | | | | |
|---------------------|------------------------------|------------|---|--------|----------------|--------------------|--------------------|-------------------------|---------------|------------------|-----------------------------|-------------------------|-------------------|----------|
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | Other Sources* | Total All Sources | |
| 1.15 | Other/Data Management | | | | | | | | | | | | | |
| 1.15.1 | - | | Reclamation fund Bella Vista water conveyance costs associated with Saeltzer Dam removal agreement. | BOR | - | - | | \$0 | \$0 | \$0 | \$25,000 | \$0 | \$25,000 | |
| | | | | | | | | Anticipated Funding | | | | | | |
| | | | | | | | | State Cash | State In-Kind | Restoration Fund | Water and Related Resources | State or Other Sources* | Total All Sources | |
| | | | | | | | | \$0 | \$0 | \$0 | \$25,000 | \$0 | \$25,000 | |
| | | | | | | | | <i>Subtotal Funding</i> | | | \$0 | \$25,000 | \$0 | \$25,000 |
| | | | | | | | | <i>Reclamation</i> | | | \$0 | \$25,000 | \$0 | \$25,000 |
| | | | | | | | | <i>Service</i> | | | \$0 | \$0 | \$0 | \$0 |
| | | | | | | | | <i>CA DFG</i> | \$0 | \$0 | | | \$0 | \$0 |
| | | | | | | | | <i>CA DWR</i> | \$0 | \$0 | | | \$0 | \$0 |
| | | | | | | | | <i>Other*</i> | \$0 | \$0 | | | \$0 | \$0 |

* List other funding source here: None

Table 2. Three-Year Funding Plan FY 2013 – 2015
(\$ amounts in thousands)

| FY Year | Description of Activities | Funding Needs | | | | |
|-------------|---|---------------|------|-------|-----|-----|
| | | RF | W&RR | Other | DFG | DWR |
| 2013 | 1.1 Program management | 160 | | | | |
| | 1.2 Program support | | | | 15 | 1 |
| | 1.3 Technical Support | | | | 15 | |
| | 1.4.1 Implement Cloverview Long-Term Gravel Supply Project Phase 2. Implementation by BLM & CDFG thru various grants.) | 2,500 | | | | |
| | 1.4.2 Gravel additions at about 8 sites to provide approximately 25,000 tons annually. | 750 | | | | |
| | 1.4.3 Implement erosion control measures on private lands. | 100 | | | | |
| | 1.5 | | | | | |
| | 1.6 | | | | | |
| | 1.7 | | | | | |
| | 1.8 | | | | | |
| | 1.9 | | | | | |
| | 1.10 | | | | | |
| | 1.11 | | 275 | | | |
| | 1.12.1 Salmonid monitoring conducted by the FWS will include: spawning area mapping, juvenile salmonid production, spawning gravel quality and evaluation of new IFIM flow prescriptions. | | | | | |
| | 1.13 | | | | | |
| | 1.14 | | | | | |
| 1.15 | | | | | | |
| | Total | 3,785 | | | 30 | 1 |
| 2014 | 1.1 Program management | 160 | | | | |
| | 1.2 | | | | 15 | 1 |
| | 1.3 | | | | 15 | |
| | 1.4.1 Foregone power costs analyses and geomorphic and salmonid monitoring to evaluate the effectiveness of EWP channel maintenance flows in 2015 and 2016. | 500 | | | | |
| | 1.4.2 Gravel additions at about 8 sites to provide approximately 25,000 tons annually. | 750 | | | | |
| | 1.5 | | | | | |
| | 1.6 | | | | | |
| | 1.7 | | | | | |
| | 1.8 | | | | | |
| | 1.9 | | | | | |
| | 1.10 | | | | | |
| | 1.11 | | | | | |
| | 1.12.1 Salmonid monitoring conducted by the FWS will include: spawning area mapping, | 300 | | | | |

| | | | | | | |
|-------------|--|---|--|--|----------|---|
| | juvenile salmonid production, spawning gravel quality, evaluation of new IFIM flow prescriptions and evaluation of EWP channel maintenance flows. 1.12.2 Multi-year contract to conduct geomorphic stream monitoring to determine amount of gravel needed to recharge the system and evaluate the success of restoration projects. Evaluate relationship between amount of gravel added and the amount of spawning habitat created. 1.13 1.14 1.15 Total | 220 | | | | |
| | | 1,930 | | | 30 | 1 |
| 2015 | 1.1 Program management 1.2 Program support 1.3 Technical Support 1.4.1 Gravel additions at about 8 sites to provide approximately 25,000 tons annually. 1.5 1.6 1.7 1.8 1.9 1.10 1.11 1.12.1 Salmonid monitoring conducted by the FWS will include: spawning area mapping, juvenile salmonid production, spawning gravel quality, evaluation of new IFIM flow prescriptions, evaluation of EWP channel maintenance flows and evaluation of long-term gravel supply project. 1.13 1.14 1.15 Total | 160 500 400 | | | 15 15 | 1 |
| | | 1,060 | | | 30 | 1 |

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

Table 3 – Proposed FY2012 CVPIA Clear Creek Fish Restoration Program Monitoring Projects

| | |
|--|---|
| Project Description: | Clear Creek Restoration Monitoring Project (Juvenile Spring Chinook Production Monitoring-Rotary Screw Trapping) Sub-Task 1-A |
| FY 2012 Project Complete? | This is an ongoing sub-task of the monitoring project. |
| CVPIA annual work plan subtask number: | Monitoring 1.12.1 |
| Scope of the monitoring effort: | Clear Creek |
| Product/deliverable: | Annual Report |
| Cost: | \$112,951 |
| Questions posed: | <ul style="list-style-type: none"> • How many juvenile spring Chinook were produced in 2012? • What environmental factors and/or management actions affected juvenile production? |
| Objectives: | <ul style="list-style-type: none"> • Produce annual report for 2011. • Collect salmonid monitoring data for 2012. |
| Results – expected or actual: | Most juvenile spring Chinook leave the upper Clear Creek watershed as fry rather than at juvenile size. |
| Data collection methods: | 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. |
| Data management: | Final reports and data will be archived in the central computer system at the RBFWO. |
| Assessment: | Passage estimates will be analyzed relative to environmental variables, population parameters and restoration activity. |
| 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. |

Table 3 – Proposed FY2012 CVPIA Clear Creek Fish Restoration Program Monitoring Projects

| | |
|---|---|
| Project Description: | Clear Creek Restoration Monitoring Project (Fall Chinook Spawning Area Mapping “SAM”) Sub-Task 1-B |
| FY 2012 Project Complete? | This is an ongoing sub-task of the monitoring project. |
| CVPIA annual work plan subtask number: | Monitoring 1.12.1 |
| Scope of the monitoring effort: | Clear Creek. |
| Product/deliverable: | Annual Report. |
| Cost: | •\$62,049. |
| Questions posed: | <ul style="list-style-type: none"> • Where are fall Chinook spawning? • How much area was used for spawning? • Are salmon using the spawning gravel or restored habitat provided by the program? • How effective is the program at increasing spawning habitat? • Where is additional restoration needed? |
| Objectives: | <ul style="list-style-type: none"> • Describe the distribution and amount of spawning in relationship to restoration actions and document spatial and temporal changes. • Evaluate the effectiveness of spawning habitat restoration relative to restoration costs, adult escapement levels, and utilization by salmonids. • Document and evaluate environmental factors and restoration actions affecting salmonid spawning. • Provide recommendations for future habitat restoration. |
| Results – expected or actual: | 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. |
| Data collection methods: | Two data collection techniques will be compared in 2011: 1) field mapping the shapes of redd aggregates on aerial photos at the end of the spawning season, and subsequently digitizing the shapes for analysis in GIS and 2) using sub-foot accuracy GPS units to outline redd aggregates while in the field and directly importing them into GIS. |
| Data management: | Final reports and data are archived in the central computer system at the Red Bluff FWO. |

Table 3 – Proposed FY2012 CVPIA Clear Creek Fish Restoration Program Monitoring Projects

| | |
|--|--|
| Project Description: | Clear Creek Restoration Monitoring Project (Fall Chinook Spawning Area Mapping “SAM”) Sub-Task 1-B |
| Assessment: | <ul style="list-style-type: none"> • Spawning area is summarized by both 1,000 foot reaches and by geomorphic-based reaches and compared between years, and between reaches. • 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. |
| Use of information in future decision making: | <ul style="list-style-type: none"> • Information will be used in determining future stream flow requirements in NMFS OCAP BO Action I.1.2. “Channel Maintenance Flows”. • 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”. • Information will be used to evaluate ongoing benefits of restoration projects and applied to the planning and design of future projects. |

Table 3 – Proposed FY2012 CVPIA Clear Creek Fish Restoration Program Monitoring Projects

| | |
|--|---|
| Project Description: | Clear Creek Restoration Monitoring Project (Conduct Spawning Gravel Evaluations; potential spawning area mapping for spring Chinook and steelhead and gravel size analysis) Sub-Task 1-C |
| FY 2012 Project Complete? | This is an ongoing sub-task of the monitoring project. |
| CVPIA annual work plan subtask number: | Monitoring 1.12.1 |
| Scope of the monitoring effort: | Clear Creek |
| Product/deliverable: | Annual Report. |
| Cost: | \$50,000.00 |
| Questions posed: | <ul style="list-style-type: none"> • How much spawning habitat is created through gravel augmentation? • How is gravel quality / size changing over time due to restoration or disturbance? |
| Objectives: | <ul style="list-style-type: none"> • Map/document spawning areas for 2011. • Produce annual report for 2011. • Collect and evaluate data for 2012. • Estimate carrying capacity (i.e. number of spawning pairs supported) using mapping/area results. |
| Results – expected or actual: | Spawning area may increase due to restoration (gravel placements) or decrease due to reductions in gravel placement. |
| Data collection methods: | 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. |
| Data management: | Final reports and data will be archived in the central computer system at the Red Bluff FWO. |
| Assessment: | a) The amount of potential spawning habitat will be compared to the PART goal of 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. |
| Use of information in future decision making: | 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 will be 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 FY2012 CVPIA Clear Creek Fish Restoration Program Monitoring Projects

| | |
|--|---|
| Project Description: | Conduct Geomorphic Monitoring |
| FY 2012 Project Complete? | Project was not funded in 2011. |
| CVPIA annual work plan subtask number: | Monitoring 1.12.2 |
| Scope of the monitoring effort: | Clear Creek |
| Product/deliverable: | Report |
| Cost: | \$180,000 |
| Questions posed: | <ul style="list-style-type: none"> • Do gravel injections alter the creek’s geomorphology in ways that benefit anadromous fish? • What level of maintenance flows are necessary to restore normative stream functions (e.g. gravel and sediment transport)? • What is the relationship between amount of gravel injected and amount of spawning habitat created? |
| Objectives: | <ul style="list-style-type: none"> • Document and conduct redd mapping, and complete project report. • Assess effectiveness of spawning gravel injections at creating useable spawning habitat. • Quantify newly created spawning habitat and use by salmonids. |
| Results – expected or actual: | <ul style="list-style-type: none"> • Complete report |
| Data collection methods: | <ul style="list-style-type: none"> • Data collected in the field using topographic and visual surveys coupled with the FWS spawning survey data and mapping |
| Data management: | Final report and data will be archived in the central computer system at Reclamation's NCAO and the FWS' Red Bluff FWO. |
| Assessment: | <ul style="list-style-type: none"> • Monitoring conducted to verify increases in available spawning habitat and use by anadromous fish. |
| Use of information in future decision making: | <ul style="list-style-type: none"> • 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. |

Table 3 – Proposed FY2012 CVPIA Clear Creek Fish Restoration Program Monitoring Projects

| | |
|--|---|
| Project Description: | Acquire Fish Counting Weir – For counting and monitoring spring-run Chinook during pulse flows and improving fish population estimates in Clear Creek. |
| FY 2012 Project Complete? | Project was not funded in 2011. |
| CVPIA annual work plan subtask number: | Monitoring 1.12.1 |
| Scope of the monitoring effort: | Clear Creek |
| Product/deliverable: | Acquire Fish Counting Weir |
| Cost: | \$40,123 |
| Questions posed: | <ul style="list-style-type: none"> • What is the effectiveness of pulse flows in stimulating the movement of spring-run adult Chinook in Clear Creek? • What is the response of adult spring-run and steelhead to restoration actions in Clear Creek? |
| Objectives: | <ul style="list-style-type: none"> • Acquire fish counting weir for use in Clear Creek • Use fish counting weir to evaluate effectiveness of habit restoration programs in Clear Creek. • Use fish counting weir to improve adult population estimates of spring-run Chinook salmon and steelhead in Clear Creek |
| Results – expected or actual: | <ul style="list-style-type: none"> • Acquire fish counting weir for managing fish populations of Clear Creek |
| Data collection methods: | <ul style="list-style-type: none"> • Direct counts of adult salmonids in Clear Creek using the fish counting weir. |
| Data management: | Data collected at the weir will be archived in the central computer system at Reclamation's NCAO and the FWS' Red Bluff FWO. |
| Assessment: | <ul style="list-style-type: none"> • Monitoring at the fish counting weir to determine run timing, adult numbers, species composition, sex ratio, size/condition/maturity, of anadromous salmonids in Clear Creek. |
| Use of information in future decision making: | For planning and implementing water management and restoration actions including RPA actions I.1.1 to I.1.6 and other actions to increase populations of spring Chinook and steelhead. Information will also be used in future status assessments and listing decisions. |