

Draft CVPIA Fiscal Year 2009 Annual Work Plan

December 1, 2008

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

Responsible Entities

Staff Name	Agency	Role
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Program Goals and Objectives for FY 2009

The goal of the AFRP, as stated in Section 3406(b)(1) of the CVPIA, is to "develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991". Section 3406(b)(1) also states that "this goal shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool".

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

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

The Restoration Plan was completed in 2001 to guide the long-term development of the AFRP. The Restoration Plan provides a programmatic-level description of the AFRP and, is used to guide the implementation of all of the provisions of the CVPIA that contribute to the goal of making all reasonable efforts to at least double natural production of anadromous fish (AFRP doubling-goal). The following provisions contribute to accomplishing the goal of the AFRP (b)(1) program: b2, b3, b21, b12, b13, b1B and b16. The Restoration Plan presents a list of reasonable actions and evaluations for each Central Valley watershed and a process by which actions and evaluations were determined to be reasonable. The Restoration Plan identifies the need for partners, local involvement, public support, adaptive management, and flexibility as key attributes of the AFRP approach.

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

To implement this plan, in 1995 the USFWS established federal Habitat Restoration Coordinator (HRC) positions assigned to specific geographic areas from the upper Sacramento River and its major tributaries south to the San Joaquin River and its major tributaries. In 1998, the AFRP added three more HRCs from the California Department of Fish and Game (DFG) to this effort. These state HRCs provide assistance to the USFWS and ensure close coordination with the DFG the state agency with trust authority for managing anadromous fish populations in California. In their assigned areas, HRCs represent the AFRP, develop and nurture partnerships, develop projects with partners that contribute to the AFRP doubling-goal, and oversee all aspects of implementation of projects in which the AFRP invests funds. Together, the USFWS and DFG HRCs form an interagency team to coordinate, develop and implement restoration projects consistent with the goal, objectives, strategies, processes and priorities described in the Restoration Plan.

The AFRP is one of five Central Valley Project Improvement Act (CVPIA) programs that has been integrated with the California Bay-Delta Authority (CBDA) Ecosystem Restoration Program (ERP) (Record of Decision, 2000)². To facilitate this integration, the above objectives are included in the CBDA ERP Draft Stage 1 Implementation Plan.³ These objectives are also complementary to other goals and objectives listed in the Draft Stage 1 Implementation Plan and would help address the objectives of the CBDA's Multi-Species Conservation Strategy⁴ and the Biological Opinion for the CVPIA⁵. The AFRP shares CBDA's vision of the Single Blueprint concept which provides a unified and cooperative approach to restoration. The AFRP is committed to integrating its activities with the Ecosystem Restoration Program's actions and evaluations and using a scientifically-based adaptive management approach, consistent with the CALFED Science Program, to achieve AFRP objectives.

Status of the Program

The Restoration Plan presents the goal, objectives, and strategies of the AFRP, as well as a list of reasonable actions and evaluations for each Central Valley watershed. The Restoration Plan identifies the need for partners, local involvement, public support, adaptive management, and flexibility as key attributes of the AFRP approach to making all reasonable efforts to at least double natural production of anadromous fish.

AFRP projects implemented from actions and evaluations in the Restoration Plan since 1995 have addressed environmental limiting factor categories that were derived from Central Valley watershed limiting factors listed in the AFRP Working Paper (Working Paper)⁶. In the early program years, the AFRP emphasized planning and environmental inventories. These were followed by implementation of habitat restoration projects. Restoration projects were implemented throughout the Central Valley watersheds in accordance with AFRP restoration priority criteria.

Central Valley Chinook salmon production (all races) drops slightly below the baseline (1967-1991) production as a result of the low returns of fall run fish in 2007. Average Chinook salmon production for

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

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

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

⁵ Programmatic Biological Opinion for the CVPIA. January 27, 2000. USBR. Sacramento, CA

⁶ USFWS, 1995. Working paper on restoration needs, habitat restoration actions to double natural production of anadromous fish in the Central Valley of California, Volume 3, AFRP. [<http://www.delta.dfg.ca.gov/afrp/workingpaper.asp>].

the period or 1992-2007 has exceeded the doubling goal target on Clear, Butte, and Battle Creeks and is just below the goal on the Mokelumne River. Substantial gains in fish populations have occurred where investment in flow and passage has occurred (Butte & Clear Creeks). Clear Creek has also had a substantial investment in habitat. Winter-run production numbers had continued to trend upward since 1996 until the 2007 returns. Spring-run numbers have trended upwards since 1991, but production was much reduced in 2006 and 2007. Fall-run production is up from the baseline by 20%, but has declined in recent years. Late fall-run production has increased greatly since the low period (1993-1997). Data on Chinook salmon doubling can be found in the Chinookprod file on the AFRP Web site. [<http://www.delta.dfg.ca.gov/afrp/index.asp>]. 2008 production numbers are not yet reported but will be updated when the data becomes available.

Table A is a compilation of information related to the progress made towards addressing the environmental limiting factor categories identified in the Working Paper and implementation of the restoration actions and evaluations in the Restoration Plan (that are based on the Working Paper's limiting factor categories). About 37% of the watershed specific environmental limiting factors (200) in the Working Paper have been addressed and 30% of all Restoration Plan actions (289) and evaluations have been implemented in the 1995 to 2008 time period.

The following sections refer specifically to actions and evaluations that fall either fully or partially under the activities of the AFRP. Actions in which another entity or CVPIA program bears responsibility are not included. Reporting on the Performance Assessment and Rating Tool (PART), since 1995, of the 63 high and medium priority structural actions and evaluations in the Restoration Plan, 23 (37%) have been completed. Reporting on the CVPIA Program Activity Review (CPAR), of the 128 Restoration Plan actions with endpoints, 30 (24%) have been completed. Of the 53 structural actions with endpoints, 14 (26%) have been completed. A total of 16 (21%) of the 75 non-structural actions with endpoints have been completed. Actions requiring annual or in perpetuity projects such as gravel augmentation (replacing gravel lost behind dams) and flow augmentation are not considered to have endpoints. Status of these actions are reported under other provisions of the CVPIA such as the (b)(2), (b)(3), and (b)(13) programs. Table A provides a breakdown of progress at addressing Limiting Factors (Working Paper) and Actions and Evaluations (Final Restoration Plan). Note that addressed is not synonymous with completed, it means that one or more projects or activities have been initiated that are tied to the Limiting Factor or Action or Evaluation.

Table A. Progress toward addressing Working Paper Limiting Factors and Final Restoration Plan Actions and Evaluations since 1995.

Watershed	Working Paper			Final Restoration Plan		
	Limiting Factors Addressed	Total Limiting Factors	Percentage of Limiting Factors Addressed	Actions & Evaluations Addressed	Total Actions & Evaluations	Percentage Actions & Evaluations Addressed
American River	2	7	29%	2	13	15%
Antelope Creek	2	2	100%	2	2	100%
Battle Creek	2	5	40%	4	12	33%
Bear Creek	0	2	0%	0	2	0%
Bear River	0	5	0%	0	8	0%
Big Chico Creek	2	5	40%	4	10	40%
Butte Creek	13	27	48%	19	39	49%
Calaveras River	2	5	40%	2	6	33%
Central-Valley Wide	0	0	0%	5	15	33%
Clear Creek	6	6	100%	7	7	100%
Colusa Basin Drain	0	3	0%	0	2	0%
Cosumnes River	3	4	75%	3	9	33%
Cottonwood Creek	0	3	0%	0	5	0%
Cow Creek	2	6	33%	2	4	50%
Deer Creek	1	5	20%	3	5	60%
Elder Creek	0	2	0%	0	2	0%
Feather River	0	6	0%	0	12	0%
Merced River	8	12	67%	3	8	38%
Mill Creek	3	5	60%	2	5	40%
Misc. Stream Tributaries	0	6	0%	1	1	100%
Mokelumne River	5	12	42%	3	13	23%
Ocean	0	0	0%	0	3	0%
Paynes Creek	0	2	0%	0	2	0%
Upper Mainstem Sacramento River	4	6	67%	9	22	41%
Sacramento-San Joaquin Delta	2	14	14%	2	29	7%
Mainstem San Joaquin River	1	10	10%	2	13	15%
Stanislaus River	6	10	60%	3	9	33%
Stoney Creek	0	8	0%	0	1	0%
Thomes Creek	0	4	0%	0	6	0%
Tuolumne River	6	11	55%	4	10	40%
Yuba River	3	7	43%	5	14	36%
All Watersheds	73	200	37%	86	289	30%

FY 2008 Accomplishments

The AFRP continued to accomplish the operating goals of developing restoration projects with partners, overseeing implementation of AFRP funded projects, working with local landowners, sharing restoration and anadromous fish expertise, and representing program goals at public and technical meetings. Note that Final Restoration Plan Action numbers indicated in parentheses refer to Action specific to a stream.

Accomplishments for FY 2008 in the Sacramento Basin

Antelope Creek is an eastside tributary to the upper Sacramento River in Tehama County. CDFG has operated a fish ladder at the Antelope Creek Edwards Dam since 1981. The ladder and dam had been damaged on a number of occasions, most recently in the January 1997 flood event. The ladder was inadequate to pass upstream migrating anadromous salmonids. A CDFG fish passage engineer designed the ladder, and the CDFG Red Bluff Screen Shop constructed the ladder in the fall of 2007, with AFRP FY05 funds. CDFG monitors adult spring run Chinook escapement in the watershed and data is reported in the CDFG Grantab that is available on the AFRP website. This was a cooperative effort with U.S. Fish and Wildlife Service (FWS), CDFG, National Marine Fisheries Service (NMFS), the Los Molinos Mutual Water Company, and the landowner.

In addition to having upstream migration issues at the Antelope Creek Edwards Dam, there is also a juvenile salmonid out-migration issue associated with the two diversions at the dam. Currently the diversions are screened; however no bypass was constructed due to the complexity of the site. The screens are a fair distance down the irrigation canals. During dry springs, irrigation starts early and juvenile salmonids get stranded in the canals. FY08 funds were awarded to the Tehama County Resource Conservation District to conduct a feasibility study to determine the best solution to get out-migrating salmonids back into Antelope Creek. This project is a cooperative effort between the FWS, CDFG, NMFS, Los Molinos Mutual Water Company, and the landowner. The feasibility study and environmental compliance should be complete in FY09.

Battle Creek has seen significant progress towards implementing AFRP Final Restoration Plan Actions 2, 6, and 7 when the Funding Transfer Agreements were signed on July 14 2008 to allow for the construction of the Battle Creek Salmon and Steelhead Restoration Project. The Restoration Project will be among the largest cold water anadromous fish restoration efforts in North America. The funding agreements were reached between the Bureau of Reclamation, CDFG, California Wildlife Conservation Board (WCB), California Department of Transportation (Caltrans)/Bay Area Toll Authority (BATA), Pacific Gas and Electric Company (PG&E), and FWS. The Restoration Project will restore approximately 42 miles of habitat in Battle Creek, a tributary to the Sacramento River that runs through Shasta and Tehama counties and will restore an additional 6 miles of habitat in its tributaries. Phase 1A of this project includes installing fish screens and ladders at the North Battle Creek Feeder and Eagle Canyon diversion dams and removing Wildcat diversion dam and appurtenant conveyance systems on the North Fork; installing Eagle Canyon Canal pipeline; and modifying Asbury dam on Baldwin Creek. The Funding Transfer Agreements will provide \$42.75 million to implement Phase 1A. No AFRP funds were used for this project during this reporting period. The Restoration Project will help restore winter- and spring-run Chinook and Central Valley steelhead, all of which are critically imperiled. AFRP HRC's provide technical assistance, facilitation and outreach activities for this project.

Also in FY2008 the Orwick fish screen improvement project was completed. This project was funded in FY06 by AFRP. The fish screen will prevent entrainment of juvenile salmonids and straying of adult

Chinook salmon at Battle Creek (Final Restoration Plan Action 4).

Big Chico Creek FY07 funds were provided for the permitting and environmental documentation required to begin construction of the Iron Canyon Fish Ladder (Final Restoration Plan Action 2). FY07 funds were also provided to identify and apply for funds to complete the construction of the ladder. The California Environmental Quality Act (CEQA) Initial Study will be reviewed in Fall 2008, and progress is being made on the other permits. Once permits and funds are acquired, and construction is implemented, the new passage facilities at Iron Canyon will provide access to an estimated 8 miles of quality spring-run Chinook salmon habitat, aid in spring-run Chinook recovery, and contribute to AFRP doubling goals.

Butte Creek Final Restoration Plan Action 18 was completed during this reporting period with the construction of the White Mallard Dam and fish ladder. The White Mallard Dam project was funded in FY03 by AFRP to facilitate passage and reduce entrainment at this facility, benefiting salmonid survival and production. Review of the draft report for the Five Points/Avis Channel Fish Passage and Entrainment Assessment was completed in June, 2008. Comments on the draft report for the Butte Slough/Sutter Bypass Fish Entrainment Study are underway. Both of these evaluation projects were funded with FY06 AFRP funds and address Evaluations 1-9 for Butte Creek in the Final Restoration Plan. Preliminary results for both reports show that implementing the potential actions (screens) would reduce entrainment and contribute to increases in juvenile-to-adult survival of Butte Creek spring-run Chinook salmon, though the individual benefits of the potential actions on population performance appears to be small due to other diversions in the system that still need to be addressed.

Bear, Cottonwood and Cow Creeks. The 2007 video weir monitoring project (Evaluation 1.5.1) for Bear, Cottonwood and Cow Creeks was a cooperative project funded by AFRP and the Sport Fish Restoration Act. The work was completed through a cooperative effort of FWS, CDFG, Western Shasta Resource Conservation District and the Cottonwood Creek Watershed Group. Although 2007 was a record low fall-run Chinook escapement year, the information provided by these efforts was scientifically valid and economically efficient. Continued monitoring at these sites will be beneficial to guide AFRP restoration efforts. In addition, the information is valuable for CDFG's Grandtab of Central Valley total Chinook returns. The final reports for all three creeks are available on the AFRP website.

Cow Creek has many agricultural diversions, some of which are known to be adult salmonid barriers.

Clover Creek, tributary to Cow Creek, has an agricultural dam and exposed siphon, both of which are complete barriers. AFRP provided FY07 funds to the Western Shasta Resource Conservation District for the Millville Diversion Environmental Compliance Project to complete all environmental compliance documents necessary to obtain permits to modify the diversion dam and siphon for fish passage, as designed. This project will open up ten (10) miles of historic habitat to fall-run Chinook and Central Valley steelhead trout, a federally-listed Threatened species. This is an interagency effort with California Department of Water Resources (DWR), CDFG, CALFED Ecosystem Restoration Program (ERP), and the Natural Resource Conservation Service. The DWR Fish Passage Improvement Program is providing initial engineering design. CALFED ERP is providing implementation funds. The project consists of removing the dam and siphon, installing agricultural grade pumps, and constructing a solar array to offset the pumping costs. The environmental compliance effort is ongoing and should be completed in FY09. This project is but one of many steps required to address Cow Creek's Final Restoration Plan Action 3.

Deer Creek. In order to address Deer Creek's Final Restoration Plan Actions 1 and 3, critical riffles identified by CDFG on Deer Creek were assessed to identify a range of critical flows needed for upstream passage of adult salmonids. In addition to the flow analysis, recommendations of potential solutions to correct passage problems at the critical riffles were also identified. AFRP provided FY04 funds for this

project and reports are available on the AFRP website.

Mill Creek. Determining escapement in Mill Creek requires an ability to accurately count adult spring-run Chinook salmon during the spring high flow season, in turbid waters and without handling the fish or potentially impeding upstream migration using weirs or traps. To address these sampling conditions, a fixed-location hydroacoustic array using split-beam (DTx) and Dual-frequency Identification Sonar (DIDSON) was chosen for evaluation. The AFRP provided FY07 funding to implement a second year of a pilot study to assess the feasibility of counting adult Chinook salmon escapement in Mill Creek, California, using fixed-location hydroacoustic techniques. Sampling occurred between April 15, 2008 and June 27, 2008. The final report for this project is forthcoming.

Sacramento River. On the mainstem Sacramento River, phase II of the La BARRanca unit of the Sacramento River National Wildlife Refuge (NWR) was funded to remove the 116 acre orchard, prepare the site and write a vegetation restoration plan (Final Restoration Plan Action 9 and Evaluations 1,5). The restoration plan will develop two options for planting designs based on the hydrologic, geologic, edaphic (soil), biologic (baseline special status species, migratory birds, plants and vegetation) and historic conditions at the site, and outline the implementation strategies for the site. The plan will include a fully irrigated restoration design option and a dryland restoration option for native grasses, forbs, and valley oak acorns. The plan will specify targeted wildlife species that will benefit from the future restoration of the site and identify the numbers of plants and seeds required for the full restoration of the site.

Yuba River. On the Yuba River a baseline hydrologic, geomorphic, and ecologic research project was conducted between Englebright Dam and the Highway 20 bridge in support of management of anadromous fish populations (Final Restoration Plan Evaluation 4). Much of this work involved ongoing analyses of 2D models. A completely new activity conducted in FY08 was an experimental gravel injection at Englebright Dam. Grain size measurements were made of pre-existing angular gravel and gravel-sized shotrock in this reach; however, no significant flows occurred on the river this winter, so limited monitoring of gravel fate took place in FY08. Also, at the Garcia Gravel Pit reference site an effort was made to locate any painted or magnetized tracer stones placed before the 2006 New Years flood, but none were found. The final report is available on the AFRP website. A peer-reviewed journal article was also published in the journal *Geomorphology*- Moir, H. J. and Pasternack, G. B. 2008. Relationships between mesoscale morphological units, stream hydraulics and Chinook salmon (*Oncorhynchus tshawytscha*) spawning habitat on the Lower Yuba River, California. *Geomorphology*. doi:10.1016/j.geomorph.2008.02.001. Also, a journal manuscript evaluating the “elasticity” of salmon selection of substrates at this site as a function of local flow velocity was written and submitted to the *Canadian Journal of Fisheries and Aquatic Sciences* for peer review. The manuscript focuses on a comparison of substrate availability with utilization and shows that salmon actually spawn on the Yuba River in a wider range of substrates than previously thought, depending on the local velocity. Three additional journal manuscripts or reports about the hydrogeomorphic response of different sites in the Yuba River to the May 2005 flood and 2006 New Years flood were drafted, and a manuscript also was drafted on the role of valley width in controlling riffle location and persistence over the last century was further analyzed. A topographic/bathymetric map of the Englebright Dam reach was also developed. This map will be valuable for evaluating the fate of gravels injected at the base of the dam. A map of the geomorphic units throughout Timbuctoo Bend was made, and photographic images of Parks Bar obtained from a blimp were compiled to produce a mosaic image of the glide-riffle-island-chute complex, including locations of salmon redds. All these activities were part of the Spawning Habitat Integrated Rehabilitation Approach (SHIRA) based river analysis and field based manipulative sediment transport experiments for the Lower Yuba River and funded entirely with FY2003-FY2007 AFRP funds at a total project cost of \$299,998. Partners for this project include PG&E, Yuba County Water Agency, UC Davis, South Yuba River Citizens League, DFG, and NMFS.

Two VAKI Riverwatcher fish counting systems were installed and operated in 2008 and used to count the number of fish passing upstream of the North and South fish ladders at the Daguerre Point Dam as a demonstration project. This data was collected to better understand the timing, abundance, population trends, and response to changing flow and temperature conditions of adult spring and fall- run Chinook salmon, and Central Valley steelhead in the Lower Yuba River (Final Restoration Plan Action 7). This information will help improve management of these species in the Lower Yuba River, including actions such as salmonid habitat restoration projects and providing appropriate in-stream flow regimes. AFRP is planning to loan the monitoring equipment to the California Department of Fish and Game with oversight by the South Yuba River Citizens League.

Accomplishments for FY 2008 in the San Joaquin Basin

Mokelumne River. During FY08, funds were again provided to purchase spawning gravel materials used for an ongoing project to increase spawning gravel quantity and improve gravel quality at known spawning sites for fall-run Chinook salmon and steelhead downstream of Camanche Dam. This gravel replenishment project is in partnership with the East Bay Municipal Utility District and addresses Actions 2 and 7 of the Final Restoration Plan for this watershed. Gravel was purchased and placed in channel. The enhanced habitat continues to provide opportunity for increased natural production of Chinook salmon and steelhead. This project area is rigorously characterized each year for spawning use, bed form and function and provides a foundation project for the Spawning Habitat Integrated Rehabilitation Approach (SHIRA) as conducted by UC Davis. Final reports are available on the AFRP website.

Cosumnes River. Permitting and final phases of project planning were completed in time to begin the channel reconstruction and gravel stockpiling and placement for the Cosumnes Passage and Habitat Improvement Project (Final Restoration Plan Action 6, Evaluation 2). The project will improve adult salmonid passage and enhance habitat by reconfiguring the channel and adding spawning gravel for both immediate use and subsequent year recruitment resulting in overall improved survival and reproduction for Chinook salmon. This project will reconfigure channel bed to provide more and higher quality spawning gravel as well as place gravel upstream for continual gravel recruitment with flow events over the course of several years. Gravel has been stockpiled on site and is readily available for placement over consecutive years. AFRP is collaborating with Fisheries Foundation of California, Omochumne-Hartnell Water District, Robertson-Bryan, Inc., and DFG and has leveraged \$232,500 in cost share and in-kind services to date.

Calaveras River. The final report for the Lower Calaveras River Chinook Salmon and Steelhead Limiting Factors Analysis was completed and will be available in the AFRP website. This project, working with the Fishery Foundation of California, was conducted to fill existing information gaps to assist in managing the Calaveras River to support anadromous salmonid populations. In particular, this project provided a quantification of flows required to pass fish upstream of current barriers. A hydrologic model of the system was developed to assist with future flow recommendations and identify the required flows needed for successful immigration and out-migration of Chinook salmon and steelhead. This analysis was designed to provide additional information by evaluating various channel bed and substrate configurations occurring in the migration corridor and to quantify the amount of flow required to provide upstream passage in the Old Calaveras River channel and Mormon Slough/Diverting Canal from tidewater to Bellota Weir. Fish passage of adult and juvenile salmonids at existing diversion dams and barriers (Action 3) and evaluating instream flow (Evaluation 2) are activities in the Final Restoration Plan that are currently being addressed by this project.

Stanislaus River. FY08 accomplishments included the collection of both juvenile and adult passage data via rotary screw trapping (juveniles) and a fish counting weir (adults) operated in partnership with Tri-Dam (Final Restoration Plan Action 1). The rotary screw trapping was funded with FY07 (b)(16) CAMP and (b2) Dedicated Project Yield funds. These studies assist with evaluating benefits resulting from habitat restoration actions and summary reports are available in the AFRP website. Two new floodplain and side-channel enhancement projects were initiated (Honolulu Bar and Lancaster Road) to increase juvenile salmonid rearing habitat and decrease predation (Final Restoration Plan Action 2). Tours of restoration sites on the river were provided to attendees of the Salmonid Restoration Federation annual meeting and to the CVPIA Fisheries Independent Review Panel.

Merced River. Rotary screw trapping to track juvenile salmonid outmigration was completed. The data will be used to assist in evaluating the benefits of habitat restoration actions. The project utilized FY07 AFRP funds and FWS staff to offset a budget shortfall that would have prevented the project from occurring. A summary report for this activity is available in the AFRP website.

Anticipated FY 2009 Projects

FY09 Projects in the Sacramento Basin

Antelope Creek. The Juvenile Fish Passage Improvement Project at Edwards Dam will be initiated with FY09 AFRP funding to have environmental compliance and construction plans developed. The juvenile fish passage improvement will prevent out-migrating salmonids from becoming entrained in the two diversion canals at Edwards Dam. Although the canals are screened, no bypass system was installed during construction due to site complexity. The road crossing in the Tehama Wildlife Area is currently a barrier to spring- and fall-run Chinook salmon during dry years in the summer and fall months. The Antelope Creek Wildlife Crossing Repair Project in the Tehama Wildlife Area will address this fish passage barrier.. In FY08 this project received National Fish Passage Program funds to develop the environmental compliance and construction designs. AFRP FY09 funding will be used for the implementation and construction phase of this project. Both of these projects will address Final Restoration Plan Action 1 for this watershed.

Cottonwood Creek . Nonnative Invasive Weed Control Project - The need to restore and maintain riparian habitat in Cottonwood Creek is clearly identified in AFRP and the CALFED Ecosystem Restoration Program (ERP) goals, objectives, and targets. Completion of environmental compliance documents and permitting; and locating and eradicating non-native noxious and invasive (NIS) plants, specifically arundo (*Arundo donax*), salt cedar (*Tamarix chinensis*), tree of heaven (*Ailanthus altissima*), black locust (*Robinia pseudoacacia*), scotch broom (*Cytisus scoparius*), and pampas grass (*Cortaderia selloana*) within the riparian corridor of Cottonwood Creek is needed. The first priority for treatment (focused project area) for this Project is located on the South Fork of Cottonwood Creek, which lies in Tehama County, and its tributaries, down to the confluence of the South Fork with the mainstem of Cottonwood Creek. Second priority for treatment is the mainstem of Cottonwood Creek, from the uppermost identified location of the above-identified NIS target species. This project will address Final Restoration Plan Action 5 for this watershed.

The Anderson-Cottonwood Irrigation District (ACID) siphon is becoming exposed once again in Cottonwood Creek and poses a passage problem for adult salmonids, particularly in dry year summer and fall months. Analyses to determine a set of alternatives that will provide a long term solution to the exposed ACID siphon; implementation will reduce the potential for negatively affecting all life stages and runs of Chinook salmon and steelhead. Therefore the Cottonwood Creek ACID Siphon Project will develop alternatives; complete environmental documentation and permits for the project; and implement the preferred alternative. This would be a cooperative project with FWS, CDFG, ACID, NMFS, and the

landowner. This project will address Final Restoration Plan Action 2 for this watershed.

A sediment budget is needed for Cottonwood Creek. The study is to include analyses of geomorphological data from 1939 to present; quantify spatial and temporal characteristics of sediment supply, storage, and transport in the system, and to identify the effects of sediment transport dynamics on perceived channel and watershed changes. The interpretation would call on cross-disciplinary expertise and will target specific questions of practical interest to local stakeholders such as: 1) How “stable” is the stream channel given historic and current natural conditions and land management?; 2) What roles do in-channel islands play and how might the practice of moving these islands affect the upstream and downstream channel and habitat conditions?; 3) Is current channel configuration a limiting factor to aquatic or terrestrial organisms of concern?; 4) Is the channel instability due to the amount of aggregate being removed by gravel mining?; and 5) Are current land use practices affecting the sediment budget in such a way as to create channel instability, and if so, how? The main concern is the channel instability of the lower watershed and how the bed material budget may be affecting channel response to different flow events. The Cottonwood Creek Geomorphological Analysis project will address Final Restoration Plan Action 1 for this watershed.

1600 Master Agreement. A pilot project to facilitate compliance with state and federal laws on diversions is a planned project in FY09. The 1600 Master Agreement Project would provide funding to local districts in Shasta and Tehama County to begin the process of developing Streambed Alteration (1600 CDFG Permit) Master Agreements for Agricultural Diversions in Shasta and Tehama Counties. Currently many diversions are unscreened, do not provide fish passage, and are not in compliance with the Fish and Game Code. This project would begin the process of working in Sacramento River, Mill Creek, Antelope Creek, and Cow Creek to bring diverters into compliance by working with conservation or other special districts in a collaborative manner. These Agreements would allow the special districts, or some other qualified entity, to enter in sub-agreements with the affected landowners to substantially divert under division 2, Chapter 6, Section 1602 of the Lake and Streambed Alteration Agreement Program. These agreements would provide a description of what activities would be covered under the Agreement, conditions for water diversion, riparian restoration and revegetation, instream structures, habitat and species protection, use of vehicles in wetted portions of the channel, pollution control, erosion and sediment control, bank stabilization, dewatering, and ground disturbing activities, and monitoring.

Bear, Cottonwood and Cow Creeks. Continue video weir technology (Evaluation 1.5.1) for Bear, Cottonwood and Cow Creeks. This work is completed through a cooperative effort of FWS, CDFG, Western Shasta Resource Conservation District and the Cottonwood Creek Watershed Group. The information provides scientifically valid and economically efficient fall-run escapement data. Continued implementation at these sites will be beneficial to guide AFRP restoration efforts. In addition, the information is valuable for CDFG’s Grandtab database which houses Central Valley total Chinook returns information. As an additional element in FY09, the Bear Creek site will be operated for a longer time period (through April) to determine the feasibility of determining adult steelhead escapement.

FY09 Projects in the San Joaquin Basin

Mokelumne River. Funds will be provided to purchase, place and monitor spawning gravel to improve natural production of Chinook salmon and steelhead at several spawning sites in cooperation with other project partners. This project area is rigorously characterized each year for spawning use, bed form and function and provides a foundation project for the Spawning Habitat Integrated Rehabilitation Approach (SHIRA) as conducted by UC Davis.

Calaveras River. The Calaveras River Passage Improvement Project will begin implementation to replace and/or retrofitting one or more migration impediments to salmon and steelhead trout in the lower

Calaveras River. This project will also serve as a community-based restoration model to demonstrate that agricultural, governmental, environmental, and educational interests can effectively work together to implement projects to foster sustainable fish populations without adversely affecting water supplies or land access. AFRP has developed a partnership and is cost-sharing with Stockton East Water District, Fisheries Foundation of California, the University of the Pacific, DFG, and DWR. Working together this partnership has committed to restore anadromous fish populations in the lower Calaveras River. This project will be essential to maintain this relationship and leverage matching habitat restoration funds that will have significant implications over many years in not only restoring access to about 10 miles of habitat but will also provide unique education and outreach opportunities in an urban community.

Cosumnes River. This project will improve fish passage at Rooney Dam on the Cosumnes River. Rooney Dam is a small flashboard dam and in its current condition, a steep four foot drop over large boulders at the downstream face of the dam creates a significant barrier to upstream migration. This project will eliminate this migration barrier by constructing a four tiered boulder weir structure(s) to create effective jumping pools for adult salmonid migration. The spawning habitat improvement project will continue to purchase and place more and higher quality spawning gravel in restored channel area, as well as place additional gravel upstream for gravel recruitment with flow events over the course of several years. Funds would also be applied to monitoring salmon escapement, passage, production, and habitat usage to provide project-level feedback for subsequent gravel placement over consecutive years. AFRP is collaborating with Fisheries Foundation of California, Omochumne-Hartnell Water District, Robertson-Bryan, Inc., and DFG and has leveraged \$232,500 in cost share and in-kind services to date.

Stanislaus River. AFRP plans to continue to partner with Tri-Dam on operation of the barrier weir to facilitate Chinook salmon escapement monitoring. AFRP also plans to continue administering the agreement to monitor juvenile salmon outmigration with the rotary screw trap at Caswell Park which was funded with FY07 USBR NMRPO funds. The new floodplain restoration projects will begin with outreach, education, planning and design. One mile of riparian fencing to restrict cattle access and protect recently restored spawning habitat at Lover's Leap is planned. The Stanislaus River Restoration Plan will be finalized.

Merced River. AFRP staff will continue to administer the agreement for rotary screw trap monitoring of outmigrant juvenile salmon that was funded with FY08 FWS Fisheries Program funds. Outreach, education, permitting and planning for three different floodplain and channel restoration projects will begin during FY09. These projects will not only enhance Chinook salmon and steelhead spawning and rearing habitat but also provide opportunities for cost-sharing through professional partnerships and community involvement. The Merced River Ranch project will restore 60 acres of floodplain and 3,600 feet of channel habitats in a reach highly degraded by dredger mining. The Merced River Snelling Channel Restoration Project proposes to restore 2 miles of channel habitats in a reach highly degraded by dredger mining. The Merced River Floodplain Restoration Project proposes to restore 600 acres of floodplain habitats in a reach that is also highly degraded by dredger mining. AFRP is collaborating with Santa Fe Aggregates, Inc., Turlock Irrigation District, DFG, and DWR to establish the groundwork for future investment by others. These projects will address the following AFRP Final Restoration Plan limiting factors, objectives, and actions: stream habitat restoration, spawning habitat augmentation, Objective 1, and Action 3 (High Priority).

Tuolumne River. The Bobcat Flat Restoration Project funds an ongoing project that restores spawning, rearing, and floodplain habitats in the Tuolumne River. This project will specifically fund the preparation of a phased Conceptual Plan to restore 120 acres of riparian floodplain and implement instream gravel augmentation as well as improve floodplain function and connectivity to the river. AFRP is working in collaboration with the Friends of the Tuolumne, Inc., Turlock Irrigation District, DFG, and DWR and is leveraging funds to cost share restoration efforts in this river. This project will address the following

AFRP Final Restoration Plan limiting factors, objectives, and actions: stream habitat restoration, spawning habitat augmentation, Objective 1, and Action 2 (High Priority).

Table 1. FY 2009 Tasks, Costs, Schedules and Deliverables

Task or Subtask Number	Name of Activity	FTE's	Description of Activity	Completion Date	Total Cost	Anticipated Funding Source RF	Anticipated Funding source W&RR
1.1	Program Management						
1.1.1		1.0	CNO Management/Admin	Sep-09	\$200,241	\$200,241	\$0
1.1.2		.95	FWS co-lead - Stockton – Program manager	Sep-09	\$190,289	\$190,289	\$0
1.1.3		.20	BOR co-lead – Sacramento	Sep-09	\$36,813	\$36,813	\$0
1.1.4		1.0	Ramon Martin - FWS Assistant Program Manager - Directs the day to day program activities, develops annual work plan, manages program budget.	Sep-09	\$200,304	\$200,304	\$0
	Subtotal Costs				\$627,647	\$627,647	\$0
1.2	Program Support						
1.2.1		.85	Habitat Restoration Coordinator - FWS – Stockton	Sep-09	\$170,259	\$170,259	\$0
1.2.2		.50	Habitat Restoration Coordinator – Stockton	Sep-09	\$100,152	\$100,152	\$0
1.2.3		1.0	Habitat Restoration Coordinator - FWS – Stockton	Sep-09	\$200,304	\$200,304	\$0
1.2.4		1.0	Habitat Restoration Coordinator - FWS – Stockton	Sep-09	\$200,304	\$200,304	\$0
1.2.5		1.0	Assistant Habitat Restoration Coordinator - FWS - Stockton	Sep-09	\$200,304	\$200,304	\$0
1.2.6		1.0	Assistant Habitat Restoration Coordinator - FWS – Stockton	Sep-09	\$200,304	\$200,304	\$0
1.2.7		.75	Environmental Compliance Biologist - Vacant - FWS - Stockton	Sep-09	\$150,228	\$150,228	\$0
1.2.8		1.0	Habitat Restoration Coordinator - FWS - Red Bluff	Sep-09	\$221,532	\$221,532	\$0
1.2.9		1.0	Habitat Restoration Coordinator -FWS - Red Bluff	Sep-09	\$221,532	\$221,532	\$0
1.2.10		.08	Regional Contracting, Budget, and Finance Support	Sep-09	\$15,000	\$15,000	\$0
<i>note:</i>	Subtotal Costs				\$1,679,919	\$1,679,919	\$0
	Restoration Actions						
1.4.1			Cottonwood Creek Nonnative Invasive Weed Control - A5(high), Structural Y, endpoint Y (high funding priority) ^{1,2}	Sep-09	\$44,520	\$44,520	\$0
1.4.2			Cosumnes River Passage Improvement Rooney Brothers E2(med) structural Y, endpoint Y (high funding priority) ^{1,2}	Sep-09	\$159,000	\$159,000	\$0
1.4.3			Tuolumne River Bobcat Flat A2(high) structural Y, endpoint Y (high funding priority) ^{1,2}	Sep-09	\$122,960	\$122,960	\$0

Task or Subtask Number	Name of Activity	FTE's	Description of Activity	Completion Date	Total Cost	Anticipated Funding Source RF	Anticipated Funding source W&RR
1.4.4			Stanislaus River Cattle exclusion fencing (high funding priority) ^{1,2}	Sep-09	\$21,200	\$21,200	\$0
1.4.5			Merced River Snelling Channel Restoration A3(high), structural Y, endpoint Y (high funding priority) ^{1,2}	Sep-09	\$20,422	\$20,422	\$0
1.4.6			Cottonwood Creek: Permitting and Design for passage at ACID siphon A2(med) structural Y, endpoint Y (high funding priority) ^{1,2}	Sep-09	\$106,000	\$106,000	\$0
1.4.7			Cottonwood Creek Geomorphological Analysis A4(high) structural Y, endpoint Y (high funding priority) ^{1,2}	Sep-09	\$127,200	\$127,200	\$0
1.4.8			Mokelumne River Spawning Habitat Improvement Project A7(high) structural Y endpoint Y (high funding priority) ²	Sep-09	\$106,000	\$106,000	\$0
1.4.9			Stanislaus River Floodplain and Sidechannel Restoration Lancaster Rd Phase 2 - A2(high) structural Y endpoint Y (high funding priority) ²	Sep-09	\$236,192	\$236,192	\$0
1.4.10			Merced River Ranch Floodplain Enhancement - A3(high) structural Y, endpoint Y (high funding priority) ²	Sep-09	\$92,000	\$92,000	\$0
1.4.11			Stanislaus River Honolulu Bar Floodplain Restoration - A2(high) structural Y endpoint Y (high funding priority)	Sep-09	\$373,882	\$373,882	\$0
1.4.12			Antelope Creek Edwards Dam Fish Passage Improvement A1(high) structural N endpoint N	Sep-09	\$127,200	\$127,200	\$0
1.4.13			Merced River Snelling Floodplain Restoration A3(high) structural Y endpoint Y	Sep-09	\$103,000	\$103,000	\$0
1.4.14			Antelope Creek Wildlife Crossing Repair - A1(high) structural N endpoint N	Sep-09	\$312,600	\$312,600	\$0
1.4.15			Cosumnes River Spawning Habitat Restoration E2(med), structural Y, endpoint Y	Sep-09	\$106,000	\$106,000	\$0
1.4.16			Calaveras River Passage Improvements - A3(med) structural Y endpoint Y	Sep-09	\$106,000	\$106,000	\$0
	Subtotal Costs				\$2,164,176	\$2,164,176	\$0
1.5	Evaluations Studies Investigations Research						
1.5.1			Yuba and Feather Sonar Arrays (See attached project description) (high funding priority) ^{1,2}	Sep-09	\$106,000	\$106,000	\$0
1.5.2			Cow, Cottonwood and Bear Creeks Video Weir (See attached project description) (high funding priority) ²	Sep-09	\$53,000	\$53,000	\$0
	Subtotal Costs				\$159,000	\$159,000	\$0
1.8	Planning						
1.8.1			DFG Habitat Restoration Coordinators (State HRCs provide assistance to the USFWS and ensure close coordination with the DFG the state agency with trust authority for managing anadromous fish populations in	Sep-09	\$279,308	\$279,308	\$0

Task or Subtask Number	Name of Activity	FTE's	Description of Activity	Completion Date	Total Cost	Anticipated Funding Source RF	Anticipated Funding source W&RR
			California)(high funding priority)				
1.8.2			Science Panel Review	Sep-09	\$28,917	\$28,917	\$0
	<u>Subtotal Costs</u>				\$308,225	\$308,225	\$0
1.9	Environmental Compliance						
1.9.1			Master 1600 Agreement with DFG	Sep-09	\$116,000	\$116,000	\$0
	<u>Subtotal Costs</u>				\$116,000	\$116,000	\$0
1.10	Design						
1.10.1			Design is generally included in the restoration project.		\$0	\$0	\$0
	<u>Subtotal Costs</u>				\$0	\$0	\$0
1.11	Construction						
1.11.1			Construction is usually included in the restoration project.		\$0	\$0	\$0
	<u>Subtotal Costs</u>				\$0	\$0	\$0
1.12	Monitoring						
1.12.1			Monitoring is included as part of the restoration project and is summarized in Table B.		\$0	\$0	\$0
	<u>Subtotal Costs</u>				\$0	\$0	\$0
1.13	Modeling						
1.13.1		1.9	IFIM staffing costs to support work on South Cow Creek and the Yuba River. (high funding priority)	Sep-09	\$381,000	\$381,000	\$0
	<u>Subtotal Costs</u>				\$381,000	\$381,000	\$0
	Total Costs				\$5,435,967	\$5,435,967	\$0
	USBR total costs				\$36,813	\$36,813	\$0
	USFWS total costs				\$5,399,154	\$5,399,154	\$0
	Potential 15% funding cut		\$60,595 from task 1.4.11; \$127,200 from task 1.4.12; \$103,000 from task 1.4.13; \$312,600 from task 1.4.14; \$106,000 from task 1.4.15; \$106,000 from task 1.4.16		\$815,395	\$815,395	

Task or Subtask Number	Name of Activity	FTE's	Description of Activity	Completion Date	Total Cost	Anticipated Funding Source RF	Anticipated Funding source W&RR
1.14	Other - Describe		Unmet Needs ³				
1.14.1			Stanislaus River Floodplain Restoration Project Lancaster Rd. Phase 1 Engineering - A2(high) structural Y endpoint Y (high funding priority)	Sep-09	\$40,738	\$40,738	\$0
1.14.2			Merced River Snelling Channel Restoration (Final Plan Development) – A3 (high), structural Y, endpoint Y	Sep-09	\$79,500	\$79,500	\$0
1.14.3			Cottonwood Creek Design for passage at ACID siphon A2 (med) structural Y, endpoint Y	Sep-09	\$26,500	\$26,500	\$0
1.14.4			Yuba River Hammon Bar Pilot Restoration E4(high) structural Y, endpoint Y	Sep-09	\$63,600	\$63,600	\$0
1.14.5			Yuba River Narrows Habitat Enhancement E4(high) structural Y, endpoint Y	Sep-09	\$106,000	\$106,000	\$0
1.14.6			Feather River Spawning, Channel, Floodplain, and Riparian Habitat Restoration	Sep-09	\$42,400	\$42,400	\$0
1.14.7			Mill Creek Riparian Habitat Maintenance and Restoration	Sep-09	\$106,000	\$106,000	\$0
1.14.8			Mill Creek Fish Passage	Sep-09	\$26,500	\$26,500	\$0
1.14.9			Mill Creek Flow and Water Quality Data Collection	Sep-09	\$15,900	\$15,900	\$0
1.14.10			Deer Creek Fish Passage	Sep-09	\$106,000	\$106,000	\$0
1.14.11			Deer Creek Riparian Habitat Maintenance and Enhancement	Sep-09	\$106,000	\$106,000	\$0
1.14.12			Deer Creek Flow and Water Quality Data Collection	Sep-09	\$38,220	\$38,220	\$0
1.14.13			Cow Creek Fish Barrier Identification	Sep-09	\$212,000	\$212,000	\$0
1.14.14			Cow Creek Fish Passage	Sep-09	\$106,000	\$106,000	\$0
1.14.15			Cow Creek Riparian Inventory and Habitat Improvement	Sep-09	\$116,600	\$116,600	\$0
1.14.16			Cottonwood Creek Barrier and Stranding Management	Sep-09	\$84,800	\$84,800	\$0
1.14.17			Cottonwood Creek Fish Population and Distribution	Sep-09	\$31,800	\$31,800	\$0
1.14.18			Cottonwood Creek Watershed Management Facilitation	Sep-09	\$53,000	\$53,000	\$0
	<u>Subtotal Costs</u>				\$1,361,558	\$1,361,558	\$0

¹ These restoration activities are FY08 projects that were not funded or only partially funded due to budget shortfalls.

² These are high funding priority activities that should not be considered for a 15% programmatic budget cut (\$815,395). Restoration Actions 1.4.11 – 1.4.16 cover a potential budget shortfall and should be funded in sequential order.

³ Additional projects are currently being developed by HRC's and will be available if additional funding is identified.

Table 2. Budget Breakout

Task	Agency	FTE	LABOR			CONTRACTS			Misc. Costs	Total Costs
			Direct Salary and Benefits Costs	FWS Costs on Salary & Benefits (35%)	FWS Overhead Assess: 22% of Direct Salary and Benefits Costs	Contract, Grant, and Agreement Costs	FWS Overhead Assess: 6% Contract Costs			
1.1 Program Management	USFW	2.95	358,733	125,557	106,544	0	0	0	590,834	
	USBR	0.20	0	0	0	0	0	0	36,813	
1.2 Program Support	USFW	8.18	1,019,987	356,996	302,936	0	0	0	1,679,919	
	USBR					0	0	0	0	
1.3 Technical Support	USFW		0	0	0	0	0	0	0	
	USBR		0	0	0	0	0	0	0	
1.4 Restoration Actions	USFW		0	0	0	2,041,676	122,500	0	2,164,176	
	USBR		0	0	0	0	0	0	0	
1.5 Evaluations, Studies, Investigations Research	USFW		0	0	0	150,000	9,000	0	159,000	
	USBR		0	0	0	0	0	0	0	
1.8 Planning	USFW		0	0	0	290,778	17,447	0	308,225	
	USBR		0	0	0			0		
1.9 Environmental Compliance	USFW		0	0	0	109,434	6,566	0	116,000	
	USBR		0	0	0	0	0	0	0	
1.13 Modeling	USFW	1.9	231,330	80,965	68,705	0	0	0	381,000	
	USBR		0	0	0	0	0	0	0	
USFWS Total Costs		13.03	1,610,050	563,518	478,185	2,591,888	155,513	0	5,399,157	
USBR Total Costs		0.20	36,813	0	0	0	0	0	36,813	
TOTAL ALL		13.23	1,646,863	563,518	478,185	2,591,888	155,513	0	5,435,967	

Table 3. Three-Year Budget Plan FY 2010 – 2012

Year	Description of Activities	Requested RF Funding	Requested W&RR Funding
2010	The highest priority activities will be to complete ongoing projects and begin work on the highest priority new projects from the Implementation Plan. Of special note will be the floodplain restoration projects on the Stanislaus, Tuolumne and Merced Rivers, the Antelope Creek and Calaveras River passage projects, Consumnes River spawning habitat work, the Yuba River Sonar arrays and the Cottonwood Creek geomorphological analysis. High priority projects in focus watersheds will begin in FY10. Outreach assessment and	\$5,950,000	\$0

	planning projects will begin on Mill Creek, Deer Creek, Cottonwood Creek, and Cow Creek.		
2011	The highest priority projects will be to complete ongoing projects and continue or begin high priority projects in our focus areas as identified above. In general, screening and passage project planning and permitting will be highest priority once outreach, assessment and planning have been completed, consistent with our Implementation Plan.	\$6,500,000	\$0
2012	The highest priority projects will be to complete ongoing projects consistent with our Implementation Plan.	\$6,900,000	\$0

Note: The FY 2010 – 2012 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 annually as RF collections are realized.

Table B. 2009 AFRP Monitoring Projects

Project Description:	Identify white sturgeon and green sturgeon spawning sites and evaluate the availability and use by adult sturgeon of spawning habitat with sonic telemetry.
FY 2009 AFRP annual work plan subtask number:	Evaluation 1.5.1
Scope of the monitoring effort:	Yuba and Feather Rivers
Product/deliverable:	Digital database with raw data files, and a final report that provides an analysis of the data.
Cost:	The total cost for conducting this project in FY 2009 is approximately \$106,000. This project is a collaborative project between Central Valley Fish Tracking Consortium (CVFTC), CDFG, and the California Department of Water Resources (CDWR).
Questions posed:	Do white or green sturgeon currently utilize the Feather and Yuba rivers for spawning? What is the migratory behavior of these species in both of these rivers? How do movements relate to flows, temperature, or other parameters?
Objectives:	Identify white sturgeon and green sturgeon spawning habitat and use in the Feather and Yuba River.
Results – expected or actual:	The proposed activity will produce digital files with raw telemetry data and a final report documenting the results of the monitoring activity.
Data collection methods:	A sonar array will be deployed in the Yuba and Feather rivers and collect telemetry data (i.e. movement, time, temperature, etc.) on tagged fish.
Data management:	Digital files with raw data will be archived by the AFRP in an Excel database. A final report documenting the

	results of the project will be available on the AFRP website.
Assessment:	The timing and duration of movements of adult green sturgeon or other species of interest during their spawning migration in the Yuba and Feather rivers will be evaluated. The environmental characteristics of sturgeon spawning habitat and juvenile rearing habitat will be described.
Use of information in future decision making:	Movement and habitat use data will assist AFRP with identifying future restoration actions for these species in both of these rivers. Green sturgeon is listed as threatened under the ESA and distribution data will assist AFRP with recovery efforts.

Project Description:	Quantify adult Chinook salmon escapement from the Bear, Cottonwood, and Cow creeks with a fish counting video weir.
FY 2009 AFRP annual work plan subtask number:	Evaluation 1.5.2
Scope of the monitoring effort:	Bear, Cottonwood, and Cow creeks.
Product/deliverable:	Digital database with raw data files, and a final report that provides an analysis of the data.
Cost:	The total AFRP cost for conducting this project in FY 2009 is approximately \$53,000.
Questions posed:	Can a fish counting weir be effectively used to quantify adult Chinook salmon escapement?
Objectives:	Acquire data to estimate escapement of adult fall-run Chinook salmon on the Bear, Cottonwood, and Cow creeks.
Results – expected or actual:	The proposed activity will produce digital files with raw data and a final report documenting the results of the monitoring activity.
Data collection methods:	A fish counting video weir was constructed and will be operated from September 2008 to January 2009 and will be used to count the number of fish passing upstream.
Data management:	Digital files with raw data will be archived by the AFRP in an Excel database. The final reports for all three creeks will be available on the AFRP website.
Assessment:	The information is utilized in CDFG's Grandtab of Central Valley total Chinook returns and is used to guide AFRP restoration efforts and evaluate program performance.

Use of information in future decision making:	This assessment is a demonstration project that will likely provide information leading to implementation of additional weirs that will provide more accurate escapement estimates in the future.
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