

Workplan for Fiscal Year 2004
August 1, 2003

I. Program Title Anadromous Fish Restoration Program (AFRP) - Central Valley Project Improvement Act (CVPIA) 3406(b)(1)

II. Responsible Entities

	Agency	Staff Name	Role
Lead	USFWS	Russ Bellmer	Program Manager, Anadromous Fish Restoration Program
Co-Lead	USBR	Ken Lentz	Program Liaison, United States Bureau of Reclamation(USBR)/Anadromous Fish Restoration Program

III. Program Objectives for FY 2004

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). These objectives are listed below.

- 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) Integrate habitat restoration efforts with harvest and hatchery management and involve partners in the implementation and evaluation of restoration actions;
- 4) Improve the opportunity for adult fish to reach their spawning habitats in a timely manner;
- 5) Collect fish population, health, and habitat data to facilitate evaluation of restoration actions.

The AFRP is one of five Central Valley Project Improvement Act (CVPIA) programs being integrated with the California Bay-Delta Authority (CBDA) Ecosystem Restoration Program (ERP). To facilitate this integration, the above objectives are included in the CBDA ERP Draft Stage 1 Implementation Plan. 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 Multi-Species Conservation Strategy and the CVPIA Biological Opinion.

The AFRP FY04 Annual Workplan is complementary and coordinated with the goals of the CBDA's Ecosystem Restoration Program Multi-year Program Plan and Year 4 Workplan (CBDA Workplan). 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 using a scientifically-based adaptive management approach to achieve AFRP objectives.

The AFRP accepted management responsibilities for eight 2002 CBDA ERP Directed Action projects. Three of them were funded in FY2003 by the AFRP (#59- Ducks Unlimited, Inc.: White Mallard Dam and Associated Diversion- Phase III, # 171- Lower American River Temperature Reduction Modeling Project and #13 - Distribution and Relationship of Resident and Anadromous Central Valley Steelhead Rainbow Trout). The remaining Directed Action projects have yet to be contracted and funded by CBDA. The AFRP developed and funded eight additional peer-reviewed projects for FY 2003.

The AFRP restoration objective gap analysis which was initially presented in the Fiscal Year 2003 Workplan for each of the Central Valley watersheds is presented again in this workplan with identified new projects incorporated into the identified “Project Target” category. The AFRP is being integrated into CBDA’s restoration project “Gap Analysis” which will ensure coordination of restoration efforts and needs. In this workplan, both ongoing or completed AFRP and CBDA projects were reviewed to avoid redundancies in the gap analysis. The AFRP has identified approximately \$15.7 million in restoration projects for immediate development, review and funding, however, the AFRP is unable to fund any projects in FY2004 because of the reduced FY 2004 AFRP Budget (reduced from \$5,000,000 in FY 2003 to \$3,000,000 in FY 2004).

AFRP Restoration and Research Gap Analysis

Central Valley-wide

- Objective 1: Improve understanding of life history requirements.
Project gap: Improve understanding of salmon and steelhead life history and population structures in Central Valley streams.
Project target: 1) Central Valley Steelhead Population Structure Evaluation (AFRP); 2) assessment of Life-history Characteristics and Genetic Composition of *Oncorhynchus mykiss* project (CBDA); 3) Steelhead Workshop; and 4) sonic tagging and tracking of yearling *Oncorhynchus mykiss*.
- Objective 2: Expand the distribution of steelhead in the Central Valley.
Project gap: Survey Central Valley watersheds to identify additional steelhead habitat.
Project target: Identify streams without steelhead targets to potentially support steelhead.
- Objective 3: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Identify actions to reduce predation on juvenile salmonids.
Project target: 1) Conduct the San Joaquin Basin Chinook Salmon Smolt Predation Workshop; and 2) effects of Predation Dynamics on Outmigrating Salmon in the Delta (CBDA).
- Objective 4: Provide education and outreach.
Project gap: Expand and support public outreach and watershed education programs.

Project target: 1) Conduct the Working at a Watershed Level training course for project partners and stakeholders (CBDA); and 2) Adaptive Management Forum (AMF) Planning team response to AMF review panel reports (<http://www.delta.dfg.ca.gov/afrp/>).

Objective 5: Improve understanding of life history requirements.

Project gap: Facilitate actions to mark and/or tag all hatchery produced salmonids within the Central Valley.

Project target: Mark and tag all Central Valley hatchery produced salmonids.

Objective 6: Improve understanding of life history requirements.

Project gap: Conduct sturgeon life history studies in the Central Valley.

Project target: Biological Assessment of Green Sturgeon in the Sacramento-San Joaquin Watershed (CBDA).

Objective 7: Acquire and restore anadromous fish habitat.
Project gap: Evaluate the feasibility of actions to restore and improve small tributaries.
Project target: 1) Fund small tributary restoration projects as available; and 2) conduct adaptive management forums to evaluate watershed level restoration.

Objective 8: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Evaluate effects of non-native species on anadromous fish.
Project target: Study gut contents of non-native species to determine if they are competing with or predated upon anadromous fish.

Objective 9: Provide education and outreach.
Project gap: Expand and support public outreach and watershed education programs.
Project target: 1) Conduct the Working at a Watershed Level training course for project partners and stakeholders (CBDA 2) Water Acquisition Workshop; and 3) Salmonid Spawning Habitat Workshop.

Objective 10: Provide education and outreach.
Project gap: Reporting updated natural production estimates of anadromous fish to resource managers and stakeholders.
Project target: Develop a database on natural production with graphic interface linked to the AFRP website (AFRP).

Upper mainstem Sacramento River and tributaries

Upper mainstem Sacramento River

Objective 1: Acquire and restore anadromous fish habitat.
Project gap: Repair erosion problems and restore available floodplain habitat in the upper Sacramento River meander corridor.
Project target: 1) Remove levees and restore floodplain function and restore pits and mounds resulting from past gravel mining operation; and 2) implement weed control projects at the La Barranca Unit, Sacramento River NWR (Phase III).

Objective 2: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Reduce loss of Chinook and steelhead juveniles due to unscreened diversions.
Project target: Screen City of Redding water supply pumps to prevent endangered winter-run Chinook entrainment.

Objective 3: Watershed management.
Project gap: Lack of collated, comprehensive watershed information.
Project target: Develop upper mainstem Sacramento River: Churn and Stillwater creeks; watershed assessment and baseline fisheries studies.

Objective 4: Improve understanding of life history requirements.
Project gap: Develop an understanding of salmon and steelhead life history and population structures in Mill, Deer, Cottonwood, and Cow creeks.
Project target: Continue escapement evaluations in Mill, Deer, Cottonwood and Cow creeks.

Cow Creek

Objective 1: Enhance and ensure adequate flow.
Project gap: Monitor stream flow and temperature to relate to abundance and migration timing of anadromous salmonids.
Project target: 1) Install water temperature recorders at select locations; 2) monitor adult salmon and steelhead abundance; 3) collect flow data from existing gages or install new real-time flow gages; and 4) develop recommendations for minimum instream flow based on temperature needs and timing of salmon and steelhead migrations.

Objective 2: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Construct fish screens and ladders, and conduct feasibility analyses for screening and laddering other agriculture water diversions.
Project target: 1) Develop a demonstration fish screen project; and 2) conduct feasibility analyses for screening and laddering five agriculture water diversions.

Objective 3: Watershed management.
Project gap: Watershed management plan.
Project target: Cow Creek Watershed Management Plan (AFRP)

Objective 4: Improve understanding of life history requirements.
Project gap: Conduct fish population investigations.
Project target: Monitor fish populations.

Battle Creek

Objective 1: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Reduce entrainment by screening diversions and prevent entrainment of anadromous fish.
Project target: 1) Screen intakes to Coleman National Fish Hatchery; and 2) prevent “take” of listed fish species by constructing a picket weir in PG&E’s Hydropower Tailrace.

Objective 2: Improve understanding of life history requirements.
Project gap: Conduct fish population, health, and habitat evaluations.
Project target: 1) Evaluate juvenile Chinook and steelhead life history; 2) conduct spawner surveys for steelhead; 3) continue rotary screw trapping for juvenile life history,

estimate spawner success, and estimate steelhead population abundance; and 4) integrate restoration efforts with hatchery and harvest management.

Cottonwood Creek

Objective 1: Enhance and ensure adequate flow.

Project gap: Monitor stream flow and temperature and relate to abundance and timing of anadromous salmonids.

Project target: 1) Collect flow and temperature data from existing gages or newly installed real-time gages; 2) determine upstream geographic distribution and timing of adult Chinook salmon; 3) determine timing and abundance of downstream migrating juvenile salmonids; and 4) develop recommendations for minimum instream flow based on temperature needs and timing of salmon and steelhead migrations.

Objective 2: Acquire and restore anadromous fish habitat.

Project gap: Identify riparian lands for acquisition from willing sellers through easements and fee properties.

Project target: Develop riparian land acquisitions in partnership with local watershed groups, landowners, stakeholders and state and federal conservation agencies.

Objective 3: Watershed management.

Project gap: Support development of a watershed management plan.

Project target: Develop a Cottonwood Creek Watershed Management Plan (CBDA).

Objective 4: Improve understanding of life history requirements.

Project gap: Estimate juvenile salmonid production.

Project target: Monitor fish populations.

Objective 5: Provide education and outreach.
Project gap: Promote community support for the local Cottonwood Creek watershed group.
Project target: Conduct a watershed group educational outreach and support.

Bear Creek

Objective 1: Provide education and outreach.
Project gap: Promote community support for a local Bear Creek watershed group.
Project target: 1) Conduct a water quality and fish population evaluation program; 2) conduct training session for residents involved in surveys; 3) conduct fall 2003 redd survey; and 4) provide educational workshops for kids and adults to address watershed issues.

Mill Creek

Objective 1: Acquire and restore anadromous fish habitat.
Project gap: Assess quality of riparian habitat and acquire and preserve riparian conservation easements and fee properties.
Project target: Survey riparian habitat, acquire riparian easements and fee properties.

Objective 2: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Acquire additional instream water supplies for enhanced anadromous fish habitat and life history requirements.
Project target: Work with state and federal water acquisition programs to develop dedicated instream water.

Objective 3: Reduce adverse impacts to anadromous fish production from fine sediments.
Project gap: Develop engineering solutions to erosion problems in the Mill Creek watershed.
Project target: 1) Reduce stream down-cutting and bank erosion; 2) build sediment retention structures; and 3) transplant native vegetation to fortify stream banks.

Objective 4: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Develop spring-run Chinook salmon and steelhead passage information in Mill Creek.
Project target: Implement the Mill Creek Anadromous Fish Passage Study (AFRP).

Objective 5: Provide education and outreach.
Project gap: Support the Mill Creek Conservancy (MCC).
Project target: Continue educational outreach and support and assist MCC in watershed management planning activities.

Deer Creek

Objective 1: Acquire and restore anadromous fish habitat.
Project gap: Assess where to install bank stabilizing devices and revegetate eroding banks.
Project target: 1) Lower Deer Creek Restoration and Flood Management Feasibility Study and Conceptual Design (CBDA); 2) reduce bank sloughing and stream down-cutting; 3) build sediment retention structures; and 4) transplant native vegetation to fortify stream banks.

Objective 2: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Develop spring-run Chinook salmon and steelhead passage information in Deer Creek.
Project target: Design and implement a Deer Creek Anadromous Fish passage study.

Objective 3: Provide education and outreach.
Project gap: Support the Deer Creek Watershed Conservancy (DCWC).
Project target: Continue educational outreach and support and assist DCWC in watershed management planning activities.

Butte Creek

Objective 1: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Construct fish passage and protection facilities.
Project target: 1) Construct White Mallard Dam and associated diversion- phase III (CBDA);
2)
Lower Butte Creek Project: Sutter Bypass - Willow Slough Weir Fish Passage Project - Preliminary Engineering Investigation; and 3) Butte Sink Water Control Structure Modifications - Phase III Construction (AFRP).

Objective 2: Improve understanding of life history requirements.
Project gap: Understand anadromous fish salmonid life history characteristics.
Project target: Continue to evaluate the juvenile life history of spring-run Chinook salmon in Butte Creek (AFRP and CBDA).

Objective 3: Enhance and ensure adequate flow.
Project gap: Develop flow recommendations and obtain additional flows for anadromous fish passage.
Project target: 1) Facilitate finalizing the change in use of the Upper Butte Basin Wildlife Area water right from agriculture to in stream use; and 2) purchase additional permanent water rights from willing sellers for in stream use.

Objective 4: Enhance and ensure adequate flow.
Project gap: Install and maintain real-time@ flow metering; monitor minimum 45 cfs of dedicated instream fish water throughout Butte Creek.
Project target: Add or change locations of certain flow gages in Sutter Bypass (AFRP).

Objective 5: Acquire and restore anadromous fish habitat.
Project gap: Conduct riparian restoration and repair erosion problems.
Project target: Acquire riparian properties from willing sellers.

Big Chico Creek

Objective 1: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Construct fish passage and protection facilities.
Project target: 1) Implement the Iron Canyon and Bear Hole Fish Passage Project; and 2) the Big Chico Creek- Habitat Restoration and Fish Passage Improvement Project.

Objective 2: Acquire and restore anadromous fish habitat.
Project gap: Habitat restoration.
Project target: Conduct Big Chico Creek habitat restoration and conservation easements.

Objective 3: Acquire and restore anadromous fish habitat.
Project gap: Spawning gravel addition.
Project target: Add spawning gravels at Five-Mile Diversion.

Objective 4: Acquire and restore anadromous fish habitat.
Project gap: Conduct riparian restoration and repair erosion problems.
Project target: Acquire riparian properties from willing sellers.

Objective 5: Improve understanding of life history requirements.
Project gap: Conduct anadromous salmonid life history study.
Project target: 1) Continue to evaluate the juvenile life history of spring-run Chinook salmon in Butte Creek; and 2) increase numbers of CWT juveniles, compensate for State funding cuts, and fund through 2005.

Lower Sacramento River, Delta Tributaries, and Delta

Feather River

Objective 1: Enhance and ensure adequate flow.
Project gap: Develop flow recommendations and obtain additional flows for anadromous salmonid passage; develop and evaluate corrective measures to address juvenile and adult stranding in side pools.
Project target: 1) Develop the Oroville Dam Federal Energy Regulatory Commission (FERC)

negotiated re-licensing study plan; and 2) implement the riparian and floodplain habitat restoration feasibility study.

Objective 2: Enhance and ensure adequate water temperature.

Project gap: Develop a temperature model to understand the impacts of temperature on anadromous fishes.

Project target: Oroville Dam FERC negotiated relicensing study plan.

Objective 3: Ensure genetic integrity.

Project gap: Develop a plan to promote isolation of spring- and fall-run Chinook salmon spawners.

Project target: 1) Develop the Oroville Dam FERC negotiated relicensing study plan; and 2) implement spring-and fall-run genetic analysis study.

Objective 4: Improve understanding of life history requirements.

Project gap: Assess value and correlate available habitat to existing sturgeon populations, identify barriers and other limiting factors to sturgeon use on the Feather River.

Project target: 1) Develop the Oroville Dam FERC negotiated relicensing study plan; and 2) implement the Biological Assessment of Green Sturgeon in the Sacramento-San Joaquin watershed (CBDA).

Objective 5: Enhance and ensure adequate flow.

Project gap: Develop flow recommendations and obtain additional flows for sturgeon and American shad passage.

Project target: Develop the Oroville Dam FERC negotiated relicensing study plan.

Yuba River

Objective 1: Reduce passage impediments including stranding, entrainment, and predation.

Project gap: Modify and maintain appropriate flows through the Daguerre Point Dam fish ladders.

Project target: 1) Design the Daguerre Point Dam fish ladder passage: engineering and design of preferred alternative; and 2) conduct VAKI Riverwatcher monitoring and analysis.

Objective 2: Reduce passage impediments including stranding, entrainment, and predation.

Project gap: Construct and improve screen and bypasses at South Yuba-Brophy Headworks.

Project target: Develop fish screen feasibility and interim fish protection measures for diversion facilities of the South Yuba and Brophy water districts (CBDA).

Objective 3: Enhance and ensure adequate water flow and temperature.

Project gap: Acquire and maintain flows to provide proper flow regime and temperature for all life stages of salmonids.

Project target: 1) Carry out Yuba River D-1644 settlement process; and 2) establish environmental Water Accounts (CBDA and CVPIA).

Objective 4: Improve spawning habitat to increase salmonid natural production.

Project gap: Implement gravel additions in upper reaches of the Yuba River.

Project target: 1) Conduct gravel additions above and below Narrows Pool (US Army Corps of Engineers mitigation); and 2) SHIRA-based River Analysis, Phase II (AFRP).

Objective 5: Acquire and or restore habitat.

Project gap: Acquire and preserve riparian conservation easements and fee properties.

Project target: 1) Develop projects from the Yuba River Technical Working Group Implementation Plan; 2) spring-run Chinook salmon habitat feasibility study; and 3) riparian and floodplain habitat restoration feasibility study.

Bear River

Objective 1: Enhance and ensure adequate flow.

Project gap: Develop flow recommendations and obtain additional flows in coordination with the Nevada County Resource Conservation District and area stakeholders in order to improve anadromous fish passage.

Project target: Develop a Bear River Watershed Plan (CBDA).

Objective 2: Provide education and outreach.

Project gap: Promote community support for a local Bear River watershed group.

Project target: Develop a Bear River Watershed Plan (CBDA).

Objective 3: Reduce passage impediments including stranding, entrainment, and predation.

Project gap: Conduct fish barrier evaluation studies and recommend solutions for improvement, and screen water diversions.

Project target: Conduct a SHIRA Analysis of the Lower Bear River.

Objective 4: Improve understanding of life history requirements.

Project gap: Evaluate white sturgeon and green sturgeon use of the Bear River spawning and rearing

Project target: Implement a biological assessment of green sturgeon in the Sacramento-San Joaquin Watershed (CBDA).

American River

Objective 1: Enhance and ensure adequate water temperature.
Project gap: Develop water temperature model.
Project target: Implement the # 171- Lower American River Temperature Reduction Modeling Project (CBDA).

Objective 2: Enhance and ensure adequate flow.
Project gap: Evaluate, provide recommendations, and participate in interagency activities to develop proper flow regimes in the American River.
Project target: 1) Conduct riparian and floodplain restoration; and 2) USBR and Water Forum Study.

Objective 3: Enhance and ensure adequate flow.
Project Gap: Support and cooperate in inter-agency efforts towards anadromous fish habitat improvement.
Project target: 1) Conduct a steelhead (life history) tracking on the American River; and 2) support and influence RCMP study.

Mokelumne River

Objective 1: Enhance and ensure adequate flow.
Project gap: Acquire additional flows from willing sellers to enhance steelhead survival.
Project target: 1) Assess which life stages of steelhead and Chinook salmon are most limited by current flows and temperatures and identify water requirements not currently available; and 2) negotiate water right purchases and/or increase flow releases from Camanche Dam.

Objective 2: Acquire and restore anadromous fish habitat.
Project gap: Determine optimal design for gravel replenishment in Central Valley rivers and continue enhancing spawning habitat.
Project target: 1) Implement the Demonstration Project to Rehabilitating Salmonid Spawning Habitat (AFRP); and 2) Continuation of Mokelumne River Spawning Habitat Improvement (AFRP).

Objective 3: Enhance and ensure adequate water quality.
Project gap: Monitor flow releases from Camanche Dam to assess effects on downstream salmonid migrants.
Project target: Determine juvenile steelhead and Chinook salmon survival for different flows and temperatures in several water-year types and recommend operational changes.

Objective 4: Acquire and restore anadromous fish habitat.
Project gap: Negotiate and acquire riparian easements and improve riparian habitats.
Project target: 1) Enhance and maintain the riparian corridor to improve streambank and channel and rearing habitat for juvenile salmonids; and 2) acquire easements to protect riparian habitat.

Cosumnes River

Objective 1: Enhance and ensure adequate flow.
Project gap: Assess instream flow needs for fall-run Chinook salmon.
Project target: 1) Implement Flow Requirement and Water Acquisition Feasibility for Fall-run Chinook Salmon in the Cosumnes River (AFRP); 2) improve flows for all life Stages of fall-run Chinook salmon; and 3) negotiate agreements with landowners, state, local and federal agencies to control water diversions and groundwater pumping.

Objective 2: Acquire and restore anadromous fish habitat.
Project gap: Acquire easements and purchase land and restore riparian habitat and fluvial processes; monitor permit requests to modify riparian habitats.
Project target: 1) Restore riparian zones to improve salmonid spawning and rearing habitats; 2) acquire lands and easements to improve riparian habitat; and 3) prevent further use of rip-rap to stabilize river banks.

Objective 3: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Remove fish barriers and assess relations between flow and egg-juvenile survival and fry-juvenile mortality due to predation.
Project target: 1) Continue improving passage of salmonids at diversion dams and barriers (AFRP and USBR); 2) determine the need for a predator control plan to reduce fry and juvenile salmon mortality by non-native fishes (AFRP); and 3) determine survival of juvenile Chinook salmon in different water-year types.

Objective 4: Acquire and restore anadromous fish habitat.
Project gap: Assess the quality of salmonid spawning and rearing habitats below and above Granlees diversion dam.
Project target: 1) Determine the carrying capacity of current and potential spawning and rearing habitat for Chinook salmon and steelhead; 2) restore spawning and rearing habitat for Chinook salmon; and 3) assess the feasibility to reintroduce steelhead trout.

Calaveras River

- Objective 1: Enhance and ensure adequate flow.
Project gap: Determine flow requirements to support anadromous runs of steelhead and fall-and spring-run Chinook salmon below New Hogan Dam.
Project target: 1) Implement the Calaveras River Salmonid Passage Study (AFRP); and 2) negotiate agreements with landowners, SEWD, CCWD, and federal and state agencies to provide additional instream flows or purchase water rights.
- Objective 2: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Evaluate best upstream and downstream migration corridor for salmonids between the Delta and Bellota Weir; Restore passage to spawning grounds above Bellota Weir and downstream passage to the Delta for steelhead and fall- and spring-run Chinook salmon.
Project target: 1) Retrofit the Bellota Weir fish ladder and monitor upstream and downstream salmonid passage (AFRP and National Fish Passage Program); and 2) develop a feasibility study for a permanent upstream and downstream passage to salmonids between the Delta and Bellota Weir.
- Objective 3: Improve understanding of life history requirements.
Project gap: Determine steelhead and fall-run Chinook salmon limiting factors and carrying capacity.
Project target: 1) Implement the Lower Calaveras River Salmonid Life History Limiting Factor Analysis (AFRP); and 2) Phase I restoration plan for anadromous fish in the Calaveras River.
- Objective 4: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Assess existing fish screen design efficiency and build screens compatible with fish rearing and upstream/downstream fish passage.
Project target: Coordinate with SEWD and DWR to accomplish Project Targets 1 and 2 under Objective 2.

Delta

- Objective 1: Enhance and ensure adequate environmental water quality.
Project gap: Maintain a 6 mg/L dissolved oxygen standard during September through November in the San Joaquin River between Turner Cut and Stockton.
Project target: 1) Conduct restoration planning for watersheds impacting low dissolved oxygen conditions in the Lower San Joaquin River near Stockton; 2) implement Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel (CBDA); 3) implement the Lower San Joaquin River Flow

Supplementation (VAMP and EWP); and 4) operate the Fall Head of Old River Barrier and DWR water quality testing.

San Joaquin Basin

San Joaquin Basin-wide

Objective 1: Improve understanding of life history requirements.

Project gap: Evaluation and distribution of salmonid population data.

Project target: 1) Provide assistance to CDFG (La Grange) to acquire and summarize existing data; 2) conduct basin-wide age determination work (AFRP); and 3) synthesize the four existing fish population models into a single best fit model.

Objective 2: Reduce mortality to outmigrating juvenile salmonids.

Project gap: Identify sources and magnitude of mortality to outmigrating juvenile salmonids.

Project target: 1) Develop comprehensive study of existing basin-wide CWT data to quantify juvenile survival; 2) cumulative assessment of basin-wide rotary screw trapping data; and 3) conduct additional structured CWT releases to evaluate San Joaquin Basin survival within and between tributaries and in the mainstem San Joaquin River.

Objective 3 Acquire and restore anadromous fish habitat.

Project gap: Quantify use of natural and restored/created spawning and rearing habitat with the basin.

Project target: 1) Conduct more detailed redd surveys within the three tributaries; 2) develop a long-term aggregate source for San Joaquin tributary projects; 3) evaluate the potential use of dredger tailings on CDFG Merced River Ranch property; (AFRP); 4) implement the Dredger Tailings Adaptive Management Studies and Mercury Investigation (CBDA); 5) conduct a Dredger Tailing Workgroup; and 6) complete the Atlas of Spawning Riffles Within the San Joaquin Tributaries (AFRP).

Objective 4: Enhance and ensure adequate flow and water quality.

Project gap: Develop the San Joaquin Basin water supply plan.

Project target: Develop a San Joaquin Basin water supply plan.

Mainstem San Joaquin River

Objective 1: Enhance and ensure adequate flow and temperature.

Project gap: Identify and attempt to implement actions that will maintain sufficient flow and mean daily water temperatures between 61°F and 65°F for at least one month from April 1 to June 30.

Project target: Conduct a San Joaquin Basin integrated water temperature model and flow study.

Objective 2: Acquire and restore anadromous fish habitat.
Project gap: Acquire and enhance riparian easements for salmonids.
Project target: 1) Acquire riparian habitat parcels from willing sellers; 2) conduct San Joaquin River National Wildlife Refuge non-structural hydraulic modeling (AFRP); and 3) implement the San Joaquin River National Wildlife Refuge Riparian Habitat Protection and Floodplain Restoration Project (CBDA).

Objective 3: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Construct fish screens at diversion intakes on the lower San Joaquin River by implementing the Anadromous Fish Screen Program CVPIA 3406(b)(21) in conjunction with other programs.
Project target: 1) Implement the Patterson Irrigation District Positive Barrier Fish Screen (CBDA); and 2) support the design and construction of pump and diversion screens.

Stanislaus River

Objective 1: Enhance and ensure adequate flow.
Project gap: Identify and provide appropriate water flow for critical salmonid life history stages.
Project target: 1) Evaluate fall pulse flow benefits for salmonid attraction and passage; and 2) evaluate flows for out-migration, passage and rearing of salmonids (AFRP).

Objective 2: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Identify causes of juvenile salmonid mortality. Construct diversion intake screens, isolate ponded sections of the river and conduct studies to determine the magnitude and distribution of the predation problem.
Project target: 1) Identify all diversions in need of screens and any migration impediments; 2) isolate ponded areas; 3) encourage other programs associated with fish passage improvement projects; 4) conduct a comprehensive study of predation on juvenile salmonids; and 5) implement Oakdale Recreation Ponds restoration.

Objective 3: Acquire and restore anadromous fish habitat.
Project gap: Develop geomorphic and restoration assessments and implement sediment restoration actions.
Project target: 1) Identify sediment problems and create a management plan with potential solutions; 2) implement Oakdale Recreation Ponds restoration; and 3) implement the Spawning Gravel Augmentation Program (USBR).

Objective 4: Acquire and restore anadromous fish habitat.
Project gap: Acquire-riparian easements and acquisitions and restore floodplain connectivity and riparian and shaded riverine aquatic habitat.
Project target: 1) Acquire riparian land and easements from willing sellers as available; 2) restore the Floodplain at Knight's Ferry; 3) restore the Mohler tract (AFRP); 3) study spatial and temporal distribution of food for rearing juvenile salmonids; and, 4) conduct Lovers Leap and Frymire Ranch Restoration and Monitoring (AFRP and DWR).

Objective 5: Improve understanding of life history requirements.
Project gap: Evaluate limiting factors for salmon and steelhead in the Stanislaus River.
Project target: 1) Coded-wire tag wild juvenile Chinook salmon to determine contribution of fry, parr and smolt emigrants to adult recruitment from the San Joaquin Basin; and 2) conduct a limiting factors analysis for salmon and steelhead.

Objective 6: Watershed management.
Project gap: Establish and develop a restoration plan.
Project target: 1) Conduct an adaptive management forum on the Stanislaus River; and 2) create a comprehensive restoration plan (AFRP).

Tuolumne River

Objective 1: Enhance and ensure adequate flow.
Project gap: Acquire additional flows and maintain flows at levels needed by anadromous salmonids.
Project target: 1) Apply the Water Acquisition Program (CBDA); and 2) implement the Up-migration and Straying of Tuolumne River Salmonids in Response to Fall Attraction Flows and Environmental Factors (AFRP).

Objective 2: Enhance and ensure adequate water temperature..
Project gap: Monitor and insure a water temperature of 56°F between October 15 to February 15 and 65°F from April 1 to May 31 within spawning habitat.
Project target: 1) Apply the Water Aquisition Program (CBDA); 2) construct the Infiltration Gallery; and 3) complete the Tuolumne River FERC Settlement Agreement.

Objective 3: Improve understanding of life history requirements.
Project gap: Determine egg-fry survival rates, rearing habitat preferences, and growth rates of Chinook salmon and steelhead.
Project target: 1) Study juvenile salmon habitat utilization and ecology; and 2) steelhead trout abundance and distribution.

Objective 4: Acquire and restore anadromous fish habitat.
Project gap: Replenish spawning gravel and reduce sedimentation; and acquire instream and riparian habitat for salmonid use.
Project target: 1) Restore the Warner-Deardorff segment (CBDA); 2) implement Tuolumne River – Big Bend project (CBDA); 3) implement MJ Ruddy Restoration Project (CBDA); 4) implement La Grange Gravel Introduction (AFRP and DWR); 5) Bobcat Flat Restoration Project (CBDA); 6) implement Tuolumne River Special Run Pool 10 (SRP 10) Restoration and Pre-project Monitoring Project (AFRP); and 7) implement the Tuolumne River Sediment Acquisition and Spawning Gravel Transfusion Project (CBDA).

Objective 5: Reduce passage impediments including stranding, entrainment, and predation.
Project gap: Construct fish screens at diversion intakes.
Project target: Construct Tuolumne River diversion screens.

Objective 6: Provide education and outreach.
Project gap: Establish a streamwatch program to increase public participation in river management.
Project target: 1) Develop the Tuolumne River Coalition (CBDA); 2) CDFG and Stanislaus County partnerships; develop the Interpretive Center in La Grange; and 3) implement the Tuolumne River Watershed Stewardship Project (CBDA).

Merced River

Objective 1: Enhance and ensure adequate flow.
Project gap: Acquire additional flows needed by anadromous salmonids.
Project target: 1) Implement the Merced River Water Temperature Management Study (AFRP); and 2) apply the Water Acquisition Program (CBDA).

Objective 2: Enhance and ensure adequate flow.
Project gap: Evaluate fall pulse flows and ramping rates for egg mortality, redd dewatering and juvenile stranding.
Project target: Water Acquisition Program (CBDA).

Objective 3: Improve understanding of life history requirements.
Project gap: Determine egg-fry survival rates, rearing habitat preferences, and growth rates of Chinook salmon.
Project target: Conduct baseline biological monitoring of the Merced River.

Objective 4: Acquire and restore anadromous fish habitat.
Project gap: Replenish spawning gravel and reduce sedimentation; acquire instream and riparian habitat for salmonid use; and investigate reintroduction of anadromous salmonids above existing fish barriers.

Project target: 1) Implement the Dredger Tailings Reach Restoration project (CBDA); 2) acquire and restore the Magneson property; 3) Evaluate the Success of Spawning Gravel Enhancement on the Merced River, Robinson Rreach (AFRP); 4) implement the Bettencourt Ranch Conservation Easement Feasibility Study and continue mining industry coordination (AFRP); and 5) develop a feasibility study to investigate the reintroduction of anadromous salmonids above the Crocker-Huffman Dam on the Merced River.

Objective 5: Control and minimize effects of non-native invasive fish and plants.

Project Gap: Invasive species control.

Project Target: Manage of invasive species in recently restored reaches.

Objective 6: Reduce passage impediments including stranding, entrainment, and predation.

Project gap: Construct fish screens at diversion intakes on the Merced River.

Project target: Design Merced River diversion screens.

IV. Status of the Program

The Final Restoration Plan for the Anadromous Fish Restoration Program (Restoration Plan) was developed to guide the long-term development of the AFRP. The Restoration Plan provides a programmatic-level description of the AFRP, and will be used to guide implementation of all sections of the CVPIA that contribute to the goal of making all reasonable efforts to at least double natural production of anadromous fish. The Restoration Plan presents the goal, objectives, and strategies of the AFRP, as well as a list of reasonable actions and evaluations to implement to make progress toward doubling natural production of anadromous fish. 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.

To implement this plan, the USFWS established five federal Habitat Restoration Coordinator (HRC) positions, each assigned a specific geographic area within California's Central Valley. In their assigned area, each HRC represents the AFRP, develops and nurtures partnerships, develops projects with partners that contribute to making all reasonable efforts to at least double natural production of anadromous fish, and oversees all aspects of implementation of projects in which the AFRP invests funds. In 1998, the AFRP added three more HRCs from the California Department of Fish and Game (DFG) to this effort; one from three of the DFG regions within the Central Valley, to provide assistance to the USFWS and to ensure close coordination with the

DFG, the State agency with primary responsibility for restoration of anadromous fish habitat. 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.

AFRP derives specific administrative support from programs of the Sacramento Field Office, Endangered Species Program (Section 7, Biological Opinions), and the Watershed Planning Branch (NEPA, Biological Assessments).

The AFRP also retains the Energy, Planning and Instream Flow Branch (EPIF) of the USFWS to provide the science-based studies essential to AFRP habitat restoration efforts (IFIMs, salmonid passage studies, habitat mapping, spawning surveys, etc.). The EPIF has reported its FY 2003 AFRP supported accomplishments (See attached EPIF Work Plan for Fiscal Year 2004).

The AFRP and several other CVPIA projects are functionally integrated with the CBDA ERP Proposal Solicitation Process (PSP) to select peer reviewed projects for AFRP funding. As part of this functional integration, potential AFRP identified projects now undergo concurrent scientific and technical review to ensure that the best and highest priority projects are implemented and to ensure the most efficient use of funds.

Because there was no CBDA Proposal Solicitation Process in FY03, the AFRP developed proposals to fill AFRP restoration gaps. The AFRP identified seven new projects for FY03 AFRP funding and coordinated CBDA directed peer reviews. AFRP HRCs managed the incorporation of all reviewers' comments into the proposals. All projects were deemed adequate and ready for FY2003 AFRP funding.

Upper mainstem Sacramento River and upper Sacramento River tributaries

This area extends from the Sacramento River mainstem and all tributaries between Keswick Dam in the north and Stony Creek in the south. There is currently one federal AFRP Habitat Restoration Coordinator (HRC), one state HRC, and one federal Assistant HRC dedicated to the implementation of restoration actions in this area. AFRP duties in this geographic region are expanding and include technical assistance to local watershed groups, and support of their efforts to develop watershed assessment and management documents as well as restoration projects. Restoration efforts in the upper mainstem Sacramento River and Sacramento River tributaries geographic area have focused on the major AFRP objectives listed in Section III, Program Objectives for FY04. AFRP funded and managed projects that developed information on fish management questions (e.g., Sex Reversal of Chinook Salmon and Genetic Identification of the Endangered Winter-run Chinook Salmon) and supported watershed restoration activities with many local watershed work groups.

The AFRP HRCs served as technical advisors for the Battle Creek Conservancy, Mill Creek Conservancy, the Deer Creek Watershed Conservancy, and local watershed work groups

associated with Cow, Lower Clear, Cottonwood, Reeds, and Red Bank creeks as well as the Sacramento River Conservation Area Forum. An evaluation of the Coleman National Fish Hatchery facility operation alternatives was conducted to insure that hatchery management activities are integrated with ongoing salmon and steelhead restoration activities in Battle Creek. The CBDA funded the Battle Creek Restoration Project (that restores approximately 42 miles of habitat in Battle while minimizing the loss of energy produced by the Battle Creek Hydroelectric Project) and continued the planning, permitting and implementation processes. A Cow Creek watershed management planning effort by the Cow Creek Watershed Management Group got underway in 2003. This plan will identify projects that will accomplish the goals identified in the completed 2001 Cow Creek Watershed Assessment. This watershed management plan will also identify specific restoration actions necessary to achieve watershed goals and describe how an adaptive management process will guide implementation of identified restoration actions. The La BARRANCA Restoration Project initiated an environmental review and hydraulic engineering analysis of options aimed at restoring floodplain connectivity of the La BARRANCA Unit (of the Sacramento River National Wildlife Refuge).

The AFRP developed engineering solutions and environmental documentation for sediment and erosion control projects on the Middle and Deer creek watersheds. Through leveraging other funding sources, the AFRP completed fish passage projects on Mill, Deer and Butte creeks and others are ongoing on Battle, lower Butte and Big Chico creeks. The Lower Butte Creek Project is divided into three phases. Phases I and II are completed. Phase I included an analysis of existing conditions and established a working group comprised of agency representatives, landowners, water district managers, wetland managers and non-profit representatives. This working group identified project water control structures resulting in a list of structural modifications and proposed alternatives to improve fish passage through the various stream reaches of the Project. Phase II used the list of alternatives, selected the preferred alternative and completed the design and environmental documentation for the eventual construction. Phase III, the construction phase, is underway and will take the plans and specifications and permits from Phase II and funding from CBDA and AFRP and the agency partners and complete construction of the preferred alternatives.

Lower Sacramento River and Delta tributaries

This AFRP geographic area extends from the Feather River south to the Calaveras River. Each of the seven watersheds within this area has unique characteristics and environmental limiting factors. There are currently two federal HRCs, one state HRC and one federal assistant HRC dedicated to the implementation of restoration actions in the Lower Sacramento River and Delta tributaries. AFRP duties in this geographic region are expanding as new watershed and stakeholder groups become organized, restoration plans are developed and greater numbers of restoration activities are started.

Restoration efforts in the Lower Sacramento River and Delta tributaries region have focused on the major AFRP objectives listed in Section III, Program Objectives for FY04. As mentioned

earlier, spawning gravel replenishment, flow acquisition and screening projects are funded concurrently through other CVPIA programs. However, the AFRP funded aquatic habitat restoration, fish passage improvements and anadromous fish life history studies on Chinook salmon and steelhead trout.

In the lower Sacramento River and tributaries area, the AFRP invested approximately one million dollars towards projects in the lower Sacramento River Region including temperature modeling on the American River, and geomorphologic and fish life history studies on the Yuba River. AFRP funded fish passage studies at Daguerre Point Dam (DPD) on the Yuba River. Of particular interest is the VAKI Riverwatcher system installed in both fish ladders at DPD. This system uses a combination of high-speed cameras and infrared sensing technology to detect movements of fish through the ladders. The data obtained from this technology can be used to supplement existing methods for tracking fish life history trends and will be an invaluable tool for analyzing species movement within the Yuba. Ongoing projects in this region remain on schedule and include: 1) the Biological Assessment of Green Sturgeon in the Sacramento-San Joaquin Watersheds, 2) Construction of An Exclusion Device to Keep Salmon from Accessing the Gold Fields, and 3) a Chinook Salmon and Steelhead Life History Evaluation.

The AFRP continues to provide technical assistance in the Oroville FERC settlement process, as well as the Yuba rivers D-1644 process. These two arenas have a tremendous influence in guiding the future of restoration efforts on these rivers. The AFRP also continues to provide technical assistance and leadership to management and stakeholder groups on the American, Feather, and Yuba rivers. Quite recently the AFRP has become involved in the collaborative development of a watershed restoration plan for Bear River and expects that this plan will provide opportunities to invest funds for the benefit of anadromous fish.

The AFRP funded a downstream passage and predation study of fall-run Chinook salmon in the Cosumnes River. The AFRP continued supporting state-of-the-art approach to replenishing spawning gravel in the Mokelumne River, and a salmonid life-history study on the Calaveras River to assess carrying capacity and restoration needs and a Central Valley genetic study on Chinook salmon.

San Joaquin Basin tributaries and mainstem San Joaquin River

This AFRP geographic area includes the Stanislaus, Tuolumne and Merced rivers including the mainstem San Joaquin River. Each of the watersheds within this AFRP geographic region has unique characteristics and environmental limiting factors. There are currently two AFRP HRCs, one federal assistant HRC, and one state HRC dedicated to the implementation of restoration actions in the San Joaquin Basin tributaries and the mainstem San Joaquin River. AFRP duties in this geographic region are expanding as new watershed and stakeholder groups become organized, restoration plans are developed and large-scale and greater numbers of restoration activities are implemented. HRCs served as technical advisors on watershed related groups such as the Stanislaus Temperature Modeling Group, Stanislaus Fish Group, Tuolumne River

Technical Advisory Committee, Tuolumne River Coalition, Merced River Stakeholder Group, Merced River Education Initiative, East Merced Resource Conservation District Steering Committee, Western Stones Planning Group, Community Alliance for Family Farms Steering Group, the Vernalis Adaptive Management Program, and the San Joaquin River Management Program.

Restoration efforts in the San Joaquin Basin tributaries and mainstem San Joaquin River region have focused on the major AFRP objectives listed in Section III, Program Objectives for FY04. Large-scale channel restoration projects to improve the geomorphologic functions of the rivers and to control predation by bass on juvenile salmonids are also being developed and funded. On the Stanislaus, the AFRP is currently funding restoration of spawning and rearing habitat in the gravel-mined channels along Frymire Ranch and Lover's Leap. An AFRP funded weir with a high-tech fish counter will begin counting the fall-run Chinook salmon in September (<http://stanislausriver.com/>). A restoration plan is being developed with input and support from the Stanislaus River Fish Group (<http://www.delta.dfg.ca.gov/srfg/>). On the Tuolumne River, restoration of the 1.1 mile 7/11 reach was completed; efforts to restore the MJ Ruddy reach are underway and planning has started to restore the Warner-Deardorff reach. On the Merced River, the AFRP funded and completed the Ratzlaff segment of the Robinson Ratzlaff Mining Reach in-channel habitat restoration project and is currently funding planning efforts for the next phase, Western Stone reach restoration. Efforts on the Merced and Tuolumne Rivers are also focused on enhancing flow, implementing Adaptive Management Forum findings, life history studies and monitoring.

V. FY 2003 Accomplishments

Eight new AFRP projects and three CBDA "Directed Action" projects from the CBDA Ecosystem Restoration Program 2002 Proposal Solicitation Package (02 PSP) were funded with AFRP dollars in Fiscal Year 2003 (\$1,895,584).

The AFRP Program supported State HRCs, the Adaptive Management Forums, AFRP project development data support needs, budget consolidation of ongoing projects and some additional unexpected overhead costs (\$740,705).

The remaining budget dollars (\$2,363,711) supported the overall AFRP Program Management including fixed overhead costs of AFRP program and project expenditures.

An additional five CBDA "Directed Action" projects from the 2002 PSP were assigned to the AFRP for project management purposes. These five projects were funded with CBDA dollars (\$22,700,000).

AFRP FY03 funded projects:

- (1) Develop a Watershed Management Plan for Cow Creek (\$42,796). This watershed management planning project will identify specific restoration actions necessary to achieve watershed goals and describe how an adaptive management process will guide implementation of identified restoration actions.
- (2) Environmental Compliance and Hydraulic Evaluation of the La BARRANCA Project (\$79,000). This proposal includes environmental review and hydraulic engineering analyses of several options aimed at restoring floodplain connectivity of the La BARRANCA Unit of the Sacramento River National Wildlife Refuge.
- (3) SHIRA-based River Analysis and Field Based Manipulative Sediment Transport Experiments to Balance Habitat and Geomorphic Goals on the Lower Yuba River (\$58,891). This proposal is in the final stages of review and work should begin in Fall 2003. This approach will use river analysis and field based manipulative sediment transport experiments to balance habitat and geomorphic goals on the lower Yuba River.
- (4) Mokelumne River Spawning Habitat Improvement Project (\$29,400). Funding will be provided to the East Bay Municipal Utility District (EBMUD) to purchase gravel and boulders to continue EBMUD's long-term spawning improvements in the lower Mokelumne River. This project is being closely coordinated with the FY 02 UC Davis project Demonstration Project to Test a New Interdisciplinary Approach to Rehabilitating Salmon Spawning Habitat in the Central Valley.
- (5) Flow Requirements for Salmon Passage in the Cosumnes River, Sacramento County, California (\$99,460). The Fishery Foundation of California and The Nature Conservancy in cooperation with local water districts and watershed groups will conduct a study of the streamflow and water supply needs for adult and juvenile salmon passage in the Cosumnes River. Emphasis will be on adult salmon passage in the fall.
- (6) Design, Construct, and Evaluate Fish Passage Facilities at the Bellota Weir on the Lower Calaveras River (\$67,486). The Fishery Foundation of California in cooperation with the Stockton East Water district and the California Department of Water Resources Fish Passage Improvement Program will improve temporary fish passage facilities on the Calaveras River at Bellota Weir, and perform preliminary engineering design for future permanent fish passage facilities at Bellota Weir or the Calaveras Headworks.
- (7) Evaluate the Success of Spawning Habitat Enhancement on the Merced River, Robinson Reach (\$90,344). Funds were provided to DWR during the 2003 fiscal year to assess and document the restoration benefits with respect to Chinook salmon spawning habitat primarily on the Robinson reach. This proposal was revised and reviewed by AFRP staff and in addition, reviewed by the CBDA ERP program.

(8) Up-migration and Straying of Tuolumne River Salmonids in Response to Fall Attraction Flows and Environmental Factors (\$49,954). Funds were provided to Stillwater Sciences to assess the relative benefits of fall pulse flow allocations for attraction flows on the Tuolumne River. This proposal was revised and reviewed by AFRP staff and in addition, reviewed by the CBDA ERP program.

AFRP Managed and funded CBDA FY 2003 Projects:

(9) #59- Ducks Unlimited, Inc.: White Mallard Dam and Associated Diversion- Phase III Construction (\$753,415). This project will replace the White Mallard Dam and construct a new fish ladder important to improve fish passage conditions and provide better flow control and monitoring.

(10) # 171- Lower American River Temperature Reduction Modeling Project (\$466,082). This project will develop predictive temperature models that will result in efficient and best use of the cold water resources in this watershed.

(11) #13 - Distribution and Relationship of Resident and Anadromous Central Valley Steelhead Rainbow Trout (\$158,756). Funds were provided to CDFG to study the composition of residency and anadromous steelhead/rainbow trout using calcium and strontium ratios in otoliths.

AFRP Managed California Bay-Delta Authority ERP funded 2003 projects:

#53- Lower Deer Creek Restoration and Flood Management: Feasibility Study and Conceptual Design (CBDA, \$1,900,000). CBDA has yet to complete contract and obligate funding.

#158-Merced River Corridor Restoration Plan Phase IV: Dredger Tailings Reach (CBDA, \$2,100,000). CBDA has completed this contract and obligated funding.

#170- Restoration of the Confluence Area of the Sacramento River, Big Chico and Mud Creeks (CBDA, \$2,900,000). CBDA has yet to complete contract and obligate funding.

#171- Sacramento River Restoration: Chico Landing Sub-Reach RM 178-206 (CBDA, \$5,000,000). CBDA has yet to complete contract and obligate funding.

#181-Tuolumne River Mining Reach Restoration Project: Warner-Deardorff Segment No. 3 – Construction (CBDA, \$10,800,000). Applicant was directed to submit revised proposal for final approval. CBDA has yet to obligate funding.

Listed below by geographic area from north to south are some FY 2003 restoration project accomplishments:

- (1) Accomplishments in the mainstem Sacramento River watershed included: a) an environmental compliance and hydraulic evaluation of the La BARRANCA project (Phase II); and, b) continued development of nuclear deoxyribonucleic acid (nDNA) markers by the University of California at Davis, Bodega Marine Laboratory to identify winter-run Chinook salmon (part of effort to determine the genetic impacts of the winter-run Chinook salmon captive broodstock program on the wild winter-run Chinook salmon population through genetic analysis and development of a population size model).
- (2) Accomplishments in Battle Creek watershed included: a) two of three components to evaluate Coleman National Fish Hatchery operation alternatives of hatchery management integration with ongoing salmon and steelhead restoration activities; b) a watershed ecology and management education course for school-aged and adult audiences; and, c) the Battle Creek Watershed Stewardship-Phase II project quarterly newsletter on restoration activities associated with the local watershed group's partial watershed assessment.
- (3) Accomplishments in Cow Creek involved assistance to the watershed management group in their watershed management plan proposal preparation. The group applied for an AFRP grant to develop a watershed based management plan using their previously developed assessment; a logical sequence of organizational events leading to the justification for funding identified restoration projects.
- (4) Accomplishments in Cottonwood, Clear, Reeds, Redbank, Mill, Deer, and Bear creeks included: a) proposal preparation and review of potential restoration projects; b) implementation of many projects (Kids-For-Our-Creeks project, aerial photography of the watershed-Cottonwood Creek; revegetation design, assessment of impacts of mercury on restoration, a flushing flow study, a temporary weir to benefit spring-run Chinook salmon-Clear Creek; non-native riparian weed control- Reeds and Redbank creeks); c) removal of remaining remnants of the 1997 washed-out Clough Dam on Mill Creek; d) finalized a fish passage study using hydroacoustic technology in cooperation with DFG, NOAA, the Mill Creek Conservancy, the Los Molinos Mutual Water District, landowners, and other interested stakeholders-Mill Creek; e) assistance in the acquisition of a range management planning grant and reviewed on site restoration efforts on Gurnsey Creek and other erosion control restoration efforts in the upper Deer Creek Watershed; and, f) assisted watershed group in a citizen-run salmon spawning redd and carcass survey and a water quality monitoring effort-Bear Creek.
- (5) Accomplishments in lower Butte Creek watershed included: a) continued funding of Ducks Unlimited as the project manager of the Lower Butte Creek; b) completion of Phase I on all five reaches of the Project (Butte Sink, including all lands south of the Colusa-Gridley Highway and east of Butte Creek and White Mallard and Associated Diversions, including all lands south of the Colusa-Gridley Highway and west of Butte Creek; Butte Slough from the Sacramento River to the Sutter Bypass; Sutter Bypass West Side; and, Sutter Bypass East Side); c) completion of Phase II on the Butte Sink and Sutter Bypass West Side reaches and

nearing completion on the White Mallard and Associated Diversions reach; and, d) development by stakeholders and agency representatives of a restoration plan to address the large number of small pumping plants and multitude of diversions and weirs located on Butte Slough and Sutter Bypass East Side is underway with a Memorandum of Agreement (MOA) submitted to agencies for legal review; e) upgrades (Phase III- Construction) to three weirs, East West Weir, Weir #3 and Weir #5, located on the west side of the Sutter Bypass; and f) continued discussions with owners/operators of the Guisti Weir on purchase of a long-term water right for in-stream flows in lieu of Guisti Weir/Weir #1 upgrade.

- (6) Accomplishments in the Feather River watershed included: the evaluation of limiting factors for sturgeon and salmon passage and spawning which is continuing through the FERC settlement process for Oroville Dam relicensing.
- (7) Accomplishments in the Yuba River watershed include: a) installation of two (2) VAKI Riverwatchers at the fish ladders on Daguerre Point Dam; b) the final design to modify the Narrows Two power plant to a 3,400 cfs release capability is complete (\$4.5 million in CBDA 2002 PSP funding was obtained); c) a complete year data set of adult salmonid passage at Daguerre Point Dam by the DFG and the South Yuba Citizens League; d) a fish passage pre-feasibility evaluation; e) initiation of study to quantify sediment movement potential (SHIRA Analysis); and f) continued negotiations with key lower Yuba River Stakeholders involved in the State Resources Control Board Decision 1644.
- (8) Accomplishments in the American River watershed included: a) the completion of the River Corridor Plan for the American River; and b) sponsorship of the California State University Sacramento – American River Science Conference.
- (9) Accomplishments in the Bear River watershed included: a) initiation of a stakeholder process to develop a restoration plan for the Bear River in coordination with the Nevada County Resource Conservation District (NCRCS). The NCRCS received funds to develop the restoration plan from the CBDA Watershed Program; and b) identification of restoration priorities in the lower Bear River including methyl-mercury contamination and giant reed (*Arundo donax*) removal from the active channel.
- (10) Accomplishments in the Calaveras River watershed included: a) Fall-winter 2002-03 Chinook salmon carcass surveys; b) completion of a progress report documenting fry and juvenile movement timing and size composition below Bellota Weir; c) an electroshocking survey conducted in June 2003 revealed 69 juvenile rainbow/steelhead in Mormon Slough just below Bellota during the irrigation season; and d) creation of the Calaveras River Fish Group to provide technical expertise to stakeholders on anadromous fish and fisheries issues in the Calaveras River.
- (11) Accomplishments in the Cosumnes River watershed included: a) documentation of upstream passage for fall-run Chinook salmon in which solutions are being planned this year;

b) passage of fall Chinook salmon was observed upstream of the retrofitted fish ladder at the south and north forks of Granlees Dam (Approximately 400 fall-run Chinook salmon redds in fall-Winter 2002-03; half of which were observed upstream of Granlees Dam); c) fry and juvenile Chinook salmon were observed between February and June and a substantial emigration of juvenile fall-run Chinook salmon coincided with high spring flows in 2003; d) substantial numbers of the non-native redeye bass were observed between Dillard Road and Michigan Bar, a potential competitor and predator of juvenile salmonids in the Cosumnes River, a reason why control/eradication efforts for this introduced species are being considered.

(12) Accomplishments in the Mokelumne River watershed included: a) dewatering of Murphy Creek has been dewatered to allow removal of the lower Murphy Creek Dam in August 2003; b) technical assistance provided by AFRP to deal with the aquatic plant problem in the Mokelumne River; tested a new interdisciplinary approach to rehabilitating salmon spawning habitat in the Central Valley. This project is demonstrating the utility of the Spawning Habitat Integrated Design Approach (SHIRA) for expanding spawning habitat; c) submittal of two manuscripts explaining SHIRA and illustrating scientific hypothesis testing under the SHIRA framework by UC Davis for scientific peer review to the journal, Aquatic Conservation; d) significant outreach efforts were made to test SHIRA beyond the Mokelumne River; and e) analysis of sediments above Murphy Creek to assess post-dam processes and changes, providing a baseline to minimize disturbances in downstream rearing areas.

(13) Accomplishments in the Stanislaus River watershed included: a) field testing of a fish counting weir which is ready to begin counting the fall-run escapement in September 2003; b) completion of a draft plan to restore anadromous fish habitat in the Stanislaus River (<http://www.delta.dfg.ca.gov/srfg/>); c) completion of an annual rotary screw trap monitoring efforts at Caswell State Park and the annual report is in progress; d) completion of a U.S. Army Corps of Engineers Stanislaus River Parks outreach pamphlet to bolster awareness of fishery management issues; e) environmental permitting is in progress for spawning and rearing habitat restoration in the Frymire Ranch and Lover's Leap reaches; f) planning and coordination is ongoing with USBR for spawning gravel introduction below Goodwin Dam; and g) environmental documentation is ongoing to complete the riparian revegetation and floodplain restoration on the Mohler Tract.

(14) Accomplishments in the Tuolumne River watershed included: a) channel and floodplain restoration at the 7/11 materials restoration site; b) acquisition of additional funds to amend the MJ Ruddy segment of the mining reach (restoration and construction is anticipated to start in September of 2003); c) completed preliminary design engineering is complete and environmental permitting and right of way has started on the Warner-Deardorff channel and floodplain restoration site in preparation for the CBDA funded, AFRP managed Warner-Deardorff restoration project; d) environmental permitting and design engineering and pre-project monitoring has started at the Tuolumne Special Run Pool 10 site; e) post-project

monitoring of the Grayson River Ranch Perpetual Conservation Easement on the Tuolumne River is in its third year; f) achieved interest in partnering with Stanislaus County to construct an interpretive/education facility on the upper Tuolumne River; and g) produced a draft Sediment Management Plan to guide future gravel augmentation management practices.

- (15) Accomplishments in the Merced River watershed included: a) support of hydraulic modeling of fish habitat benefits of post-restoration at the Robinson Ranch Reach (the AFRP hired the USFWS Energy and In-stream Flow Branch to conduct Physical Habitat Simulation studies of the area); b) preliminary design engineering and landowner coordination at the lower Western Stones restoration site; c) completion of all three Adaptive Management Forums (AMF) (Tuolumne, Merced, and Clear creek reports are available on the AFRP web site). An additional report synthesizing all three watersheds will be available soon; d) 60% completion of the water temperature modeling efforts by Merced Irrigation District; e) purchased 20 water quality test kits to encourage landowner water testing in coordination with the East Merced Resource Conservation District; f) started negotiations on the feasibility of conservation easements with several landowners living on the Merced River; g) managed Merced River Dredger Tailings Reach phase I adaptive management studies and restoration, and mining industry, county planning department, and resource agency coordination has started to impart more environmental-friendly practices by the aggregate mining industry.
- (16) Accomplishments in the mainstem San Joaquin River included: the completion and incorporation of San Joaquin River National Wildlife Refuge wetlands plans into hydraulic modeling efforts funded by AFRP to evaluate proposed non-structural flood control management alternatives on the Refuge.
- (17) Accomplishments in the San Joaquin Basin included: a) 75% completion of a CDFG riffle atlas study to provide a comprehensive San Joaquin Basin riffle inventory; b) completed a draft feasibility study report for developing a long-term aggregate source for San Joaquin tributary channel restoration projects; c) 80% complete on a CDFG study to read archived Chinook salmon scale samples from the San Joaquin Basin to be used to update a salmon population model to assist flow management alternative evaluations on the tributaries is; and d).
- (18) Comprehensive program accomplishments included: a) renovation of existing website to provide more user-friendly access to information; b) updated and expanded scope of information available on the web site.

VI. Tasks, Costs, Schedules and Deliverables

A. Narrative Explanation of Tasks.

- 1.0 Program management (USFWS-Stockton Fish and Wildlife Office (STFWO))
- 1.1 Program management (AFRP-STFWO) - The USFWS Anadromous Fish Restoration Program (AFRP) Manager (PM) is responsible for managing the AFRP. The Assistant AFRP Program Manager reports directly to the AFRP PM and implements the AFRP. The program develops all grants and cooperative agreements and implements the overall program including outreach, coordinating with stakeholders, identifying funding partners and funding peer-reviewed restoration projects.
- 1.2. Program management (USBR/AFRP) Liaison - The US Bureau of Reclamation (USBR) Liaison coordinates AFRP activities between the AFRP and the USBR and assists in developing and implementing the overall program including outreach, coordinating with stakeholders, and identifying partnering funds.
- 1.3 Program implementation (AFRP-STFWO) - The Habitat Restoration Coordinators (HRC) identify restoration priorities, develop and nurture restoration partnerships, review proposals within the CBDA ERP Proposal Solicitation Process framework, recommend projects for AFRP funding, manage project deadlines and deliverables and implement the AFRP. The Assistant HRC's assist the AFRP PM, the Assistant PM, and HRC's on all AFRP work.
- 1.4 Program implementation (AFRP- Red Bluff Fish and Wildlife Office (RBFWO)) - Same as 1.3 above.
- 1.5 Technical support (Sacrament Fish and Wildlife Office (SFWO)) - Incremental Flow Instream Methodology (IFIM) - The IFIM biologists carry out AFRP directed IFIM studies in the Sacramento and San Joaquin basin rivers and tributaries. These activities, instream flow requirements for CVPIA, are covered under a separate program, 3406 (b)(1)(B).
- 1.6 Administrative support (CVPIA- SFWO) - The SFWO provides support to the AFRP in external affairs, administration, and interagency program coordination.
- 2.0 Environmental documentation, permitting and appraisal review.**
- 2.1 Environmental documentation (USFWS, SFWO-Habitat Conservation Division (HCD)) Endangered Species Program completes AFRP requested National Environmental Policy Act assessments, Endangered Species Act, and cultural resource environmental documentation for AFRP projects.
- 2.2 Appraisal review (USFWS-SRFO) - AFRP PM coordinates with real estate easement and acquisition appraisal support for any proposed fee title or conservation easement acquisitions the AFRP is lead on.
- 2.3 Environmental documentation and permits, Endangered Species Division (USFWS-

Sacramento Valley Branch, Endangered Species Division (EDS)) - AFRP Program Manager coordinates with Endangered Species Division for any proposed restoration activities that the AFRP is lead on.

3.0. Project funding and implementation. As part of efforts to better integrate implementation of CVPIA and CBDA programs consistent with the CBDA Implementation Memorandum of Understanding, the AFRP expects to identify future projects through the CBDA ERP Proposal Solicitation Process. Projects will be identified for funding based on their contribution to the AFRP and CBDA program objectives, and consistency with the priorities listed in the FY04 AWP, Section III. Program Objectives for FY 2004, and in consideration of the review comments and recommendations resulting from the CBDA ERP Proposal Solicitation Process. Some of the specific projects may be a continuation of previously funded projects, others will be new to the program. Project prioritization will also be closely coordinated with the USBR, Central Valley Project Conservation Program.

B. Schedule and Deliverables

#	Task	Dates		Deliverable
		Start	Compleat	
1	Program management	10/01/03	09/30/04	Provides a revised FY2003 Annual Work Plan (AWP), a draft FY2004 AWP; and final grants, cooperative agreements, and contracts for projects supported by the AFRP, identifying partners and cofunding, selecting and funding peer-reviewed restoration projects.
1.1	Program management (AFRP/STFWO)	10/01/03	09/30/04	Program manager is responsible for AFRP performance and CBDA integration. Assistant Program Manager reports to Program Manager and implements the AFRP (see 1 above).
1.2	Program management (USBR/AFRP)	10/01/03	09/30/04	Provides liason between USBR and AFRP
1.3	Program implementation (AFRP/STFWO)	10/01/03	09/30/04	Habitat Restoration Coordinators (HRC) prioritize projects, develop partnerships, develop proposals, and manage project deadlines and deliverables. Assistant HRCs support all HRC work.
1.4	Program implementation (AFRP/RBFWO)	10/01/03	09/30/04	Provides grants, cooperative agreements, and contracts for USBR-led projects (see 1.3 above).
1.5	Technical support AFRP/SFWO)	10/01/03	09/30/04	Conducts instream flow, spawning habitat studies, prepares annual reports. Instream flow requirements for CVPIA are covered under a separate program 3406(b)(1)(B).
1.6	Administrative support (CVPIA/SFWO)	10/01/03	09/30/04	Provides support in external affairs, administration and interagency program coordination to AFRP.
2.0	Environmental documentation, and appraisal review	10/01/03	09/30/04	Provides NEPA and ESA documents and appraisal reviews AFRP-led projects
2.1	Environmental documentation (USFWS/SFWO/HCD)	10/01/03	09/30/04	Provides NEPA and ESA documents required for obligation of program funds as required for each of the projects supported by the program.
2.2	Appraisal review (USFWS/SRFO)	10/01/03	09/30/04	Provides real estate easement and acquisition appraisal support for proposed fee title or conservation easement acquisitions.
2.3	Environmental documentation and permits (USFWS/SFWO/EDS)	10/01/03	09/30/04	Provides Biological Opinions, EA's and NEPA documents on AFRP-led projects.

#	Task	Dates		Deliverable
		Start	Compleat	
3.0	Project funding and implementation	10/01/03	09/30/04	Project funding and implementation. As part of efforts to better integrate implementation of CVPIA and CBDA programs consistent with the CBDA Implementation Memorandum of Understanding, the AFRP expects to identify future projects through the CBDA ERP Proposal Solicitation Process. Projects will be identified for funding based on their contribution to the AFRP and CBDA program objectives, and consistency with the priorities listed in the FY04 AWP, Section III. Program Objectives for FY 2004, and in consideration of the review comments and recommendations resulting from the CBDA ERP Proposal Solicitation Process. Some of the specific projects may be a continuation of previously funded projects; others will be new to the program. Project prioritization will also be closely coordinated with the USBR, Central Valley Project Conservation Program.

C. Summary of Program Costs and Funding Sources

#	Task	Total Cost	Funding Sources
1.0	Program management		
1.1	Program management (USFWS/STFWO)	473,900	473,900
1.2	Program management (USBR/AFRP)	1,000	1,000
1.3	Program implementation (AFRP/STFWO)	653,392	653,392
1.4	Program implementation (AFRP- RBFWO)	270,503	270,503
1.5	Technical Support (AFRP/SFWO)	460,001	460,001
1.6	Administrative support (CVPIA/SFWO)	145,875	145,875
	Subtotal	1,766,968	1,766,968
2.0	Environmental documentation and appraisal review		
2.1	Environmental documentation (USFWS/SFWO/HCD)	145,875	145,875
2.2	Appraisal review (USFWS/SRFO)	7,080	7,080
2.3	Environmental documentation and permits, Endangered Species Division (USFWS/SFWO/ESD)	72,937	72,937
	Subtotal	225,892	225,892
3.0	Project Funding and Implementation	769,257	769,257
	Total Program Budget	3,000,000	3,000,000

D. CVPIA Program Budget.

#	Task	FTE	Operations Costs	Contract Costs	Overhead Costs	Total Costs
1.0	Program management					
1.1	Program management (USFWS/STFWO)	1.5	198,856	239,250	35,794	473,900
1.2	Program management (USBR/AFRP)	0.05	1,000		180	1,180
1.3	Program implementation (AFRP/STFWO)	5.00	527,960	30,399	95,033	653,392
1.4	Program implementation (AFRP- RBFWO)	2.29	229,240		41,263	270,503
1.5	Technical Support (AFRP/SFWO)	3.15	389,831		70,170	460,001
1.6	Administrative support (CVPIA/SFWO)	1.00	123,623		22,252	145,875
	Subtotal	12.99	1,470,510	269,649	264,692	2,004,851
2.0	Environmental documentation and appraisal review					
2.2	Environmental documentation (USFWS/SFWO/HCD)	1.00	123,623		22,252	145,875
2.2	Appraisal review (USFWS/SRFO)	0.10	6,000		1,080	7,080
2.3	Environmental documentation and permits, Endangered Species Division (USFWS/SFWO/EDS)	0.50	61,811		11,126	72,937
	Subtotal	1.60	191,434		34,458	225,892
3.0	Project Funding and Implementation			736,131	33,126	769,257
	Total Program Budget	14.59	1,661,944	1,005,780	332,276	3,000,000
<p>Explanatory Notes: Costs for each of the primary tasks shown in bold show the total for each of the sub-tasks shown below the primary task. Contract and Administrative costs are estimates.</p> <p>Actual costs to be based on projects identified in coordination with the Bay-Delta Program ERP Proposal Solicitation and review process and on the entity managing those projects.</p>						

E. CVPIA Program Budget - Additional Funding Needs.

Additional projects which meet the above priorities will be implemented as funding allows. Priority will be given to activities that promote natural channel and riparian habitat values and natural processes, such as those affecting stream flow, water temperature, water quality and riparian areas, and to activities that affect emigration or access to streams, such as sites of entrainment into diversions and migration barriers.

VII. Future Years Commitments/Actions

Some actions planned for FY2004 may require maintenance and/or monitoring activities in future years. This is particularly relevant for any proposed restoration projects or any multi-year survey requests. Property acquisitions (fee title or conservation easements) may require future funding for the development and/or implementation of management activities. Continuing activities should contribute towards the recovery of federal and state listed fish species and their habitats. Provided increased budgets, the AFRP could potentially spend upwards of \$15 million per year on peer-reviewed habitat restoration projects and watershed research.