



CVPIA

ANNUAL REPORT FOR FISCAL YEAR 2004

Implementation of the Central Valley Project Improvement Act

Annual Report for Fiscal Year 2004

**U.S. Department of the Interior
Fish and Wildlife Service
Bureau of Reclamation**

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Central Valley Project Improvement Act Annual Report for Fiscal Year 2004

INTRODUCTION

In one of its last actions of the session, the 102nd Congress in 1992 passed, and the President signed, the multi-purpose water legislation known as the Central Valley Project Improvement Act (CVPIA or Act). Officially designated Title 34 of Public Law 102-575, this landmark piece of legislation mandates changes in the purposes and management of the Bureau of Reclamation's (Reclamation) Central Valley Project (CVP) and specifically focused the Secretary of the Department of the Interior (Interior) on protection, restoration and enhancement of fish and wildlife associated with the CVP. The Secretary, in turn, assigned primary responsibility for implementing CVPIA's many provisions to Reclamation and the U.S. Fish and Wildlife Service (Service), both agencies of Interior.

It has been 12 years since Congress passed the CVPIA and, during that period, Reclamation and the Service have been diligently implementing its many provisions. Many have been completed and most others are well under way, at a cost so far of more than \$759.4 million of State, Federal and private funds. Significant progress has been made in accomplishing the mandates that Congress established. While Interior is rightly proud of its accomplishments to date, additional time, effort, and funds will be needed to fulfill the CVPIA's requirements and to achieve all of the goals and objectives embodied in the statute. This report is intended as a summary of the actions taken by Reclamation and Service personnel, working together with other State and Federal agencies and numerous partners and stakeholders, in fiscal year (FY) 2004. Greater detail on the programs and projects described here, or on the progress towards achieving the Act's goals and objectives, can be obtained by contacting either agency or the individual CVPIA project and program managers directly.

The Central Valley Project's Role in California's Water Resources

For almost 70 years, California has depended on the CVP for a large part of its water needs, particularly for agriculture. With a climate typified by extremely variable precipitation, both temporally and regionally, the State relies heavily on dams and reservoirs to balance and manage its water resources, and on an extensive distribution system to match water supplies with regional needs.

Much of the State's water originates in the north and is conveyed southward, primarily through the Sacramento River system. Some water is diverted along the way, and the rest flows into the Sacramento-San Joaquin River Delta (Delta), where CVP water co-mingles with other supplies such as those of the State Water Project (SWP). About half of the water entering the Delta is pumped south: the remainder discharges to the San Francisco Bay and Pacific Ocean. Because of the way water is captured and moved through the Central Valley system, the CVP affects, and is affected by, the many unresolved water issues in California involving ecosystem balance in its river systems and the Delta.

The sensitive ecosystems of the Central Valley, the Delta estuary, San Francisco Bay, and the Trinity River are affected by water diversions, particularly in drought years, so much so that the courts have intervened to assure that adequate fresh water enters these systems. Compliance with Endangered Species Act (ESA) and water quality requirements mandates releases from CVP dams to regulate water temperatures, salinity, and instream flows, and limits water diversions to protect listed fish from the effects of pumping. These factors have greatly increased the competition for existing supplies and have focused scrutiny on the ways that water resources are being used.

Conditions have greatly changed since the CVP was authorized in 1935. Population growth and development have increased farm, urban, and industrial water demands. Concurrently, stocks of fish and wildlife have declined, resulting in some species being listed as endangered or threatened due to severe habitat loss. In response, a new imperative for resource management and ecological stewardship has evolved.

The CVPIA Mandate

The intent of Congress in passing the CVPIA is contained in Section 3402. Congress, recognizing the importance of the CVP in California's water resources picture, made significant changes in the policies and administration of the project - more than any other legislation in the CVP's almost 70-year history. The Act also redefined the CVP's purposes and identified several specific goals and objectives for Interior to meet.

To achieve the CVPIA's purposes, a large number of provisions were incorporated into the statute. These include specific programs, measures, and operational and management directives, all to be implemented consistent with the requirements of California and Federal law. These provisions deal with water contracts, improved water management, restoration of anadromous fish populations, water supplies for State and Federal refuges and wildlife habitat areas, mitigation for other CVP-impacted fish and wildlife, and retirement of drainage-impaired agricultural lands. They also provide for system-wide modeling, numerous investigations and studies, and for monitoring to assess the biological results and effectiveness of CVPIA actions. To help implement these measures, the Act provided for establishing a

Purposes of the CVPIA (Section 3402)

- (a) to protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California;
- (b) to address impacts of the Central Valley Project on fish, wildlife, and associated habitats;
- (c) to improve the operational flexibility of the Central Valley Project;
- (d) to increase water-related benefits provided by the Central Valley Project to the State of California through expanded use of voluntary water transfers and improved water conservation;
- (e) to contribute to the State of California's interim and long-term efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and
- (f) to achieve a reasonable balance among competing demands for use of Central Valley Project water, including the requirements of fish and wildlife, agricultural, municipal and industrial, and power contractors

Restoration Fund, derived from fees paid by those who have benefited from the CVP's water and power supplies.

The CVP and other water projects have helped make the Central Valley the richest agricultural region in the nation and support the largest population of any state in the nation. California leads the nation in water use, both surface water and groundwater. The ability to develop and use this precious resource has been a boon to the economy of the State but has also come at great price to the natural environment. The CVPIA has afforded Interior a prime opportunity to help restore conditions favorable for fish and wildlife in the Central Valley while at the same time providing for the continuation of its rich agricultural heritage and service to municipal and industrial users throughout the State.

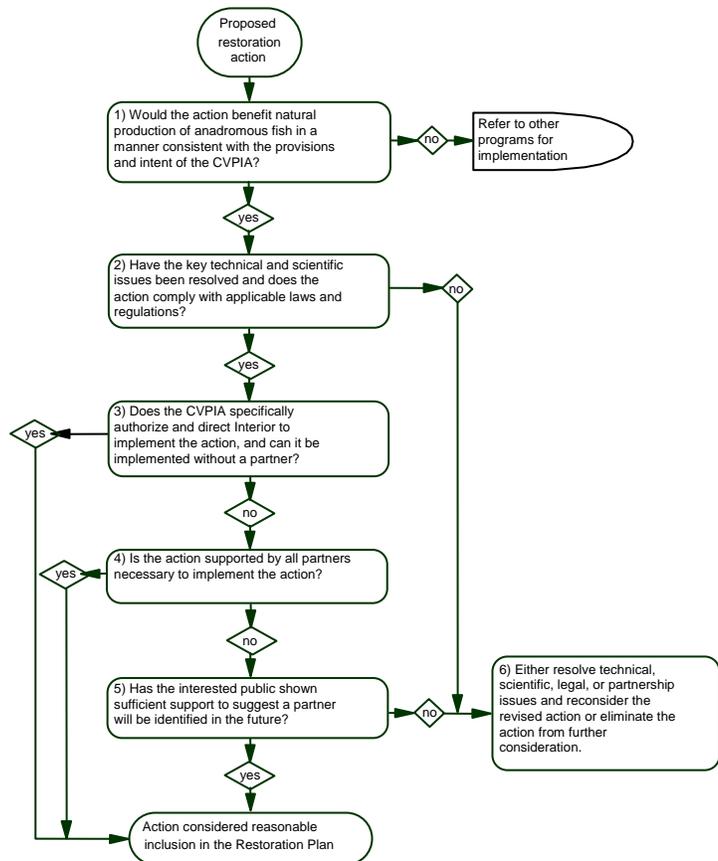
IMPLEMENTING THE CVPIA

Process

Upon the CVPIA's passage, Reclamation and the Service immediately focused on three main fish and wildlife restoration initiatives identified in the Act. One of the most ambitious of these was to make all reasonable efforts to at least sustainably double the natural production of six species of anadromous fish, species believed to have been affected by CVP construction and operation. The process to determine the reasonableness of anadromous fish restoration actions was defined in the Final Restoration Plan (Plan) for the Anadromous Fish Restoration Program (AFRP; 2001).

Actions contained within the Plan were determined to be reasonable given numerous technical, legal, and implementation considerations. The diagrammatic explanation to the right is excerpted from the Plan and depicts the process used to determine if actions were reasonable.

Another restoration initiative was to supply much-needed water to Federal and State refuges and other migratory waterfowl habitats in the Central Valley. The third was to address other adverse environmental impacts of the CVP, impacts not previously offset or specifically covered in other provisions of the Act. At the same time, Interior reaffirmed its commitment to improving the operational flexibility of the CVP in order to more effectively balance and meet the many competing demands for



project water supplies, including environmental, agricultural, municipal and industrial, and power generation needs.

Procedural policies and guidelines were also developed for implementing the Act's specific provisions. Actions proposed for implementation under the CVPIA are prioritized on an annual basis. Any action undertaken to implement the Act must be designed to contribute to the attainment of CVPIA goals while providing the greatest public benefit and minimizing adverse impacts to other CVP beneficial uses. Great emphasis is placed on forming partnerships and coordinating with other restoration efforts planned or already underway throughout the Central Valley. Stakeholders and the public are to be fully involved and kept informed. Another key procedural objective is to use the funds available to us in a cost-effective manner.

Most of the programs established to address specific CVPIA provisions had the same initial steps in common. All required an administrative structure, opportunity for public and stakeholder involvement, and coordination with potential partners to develop program plans. Compliance with applicable State and Federal laws before initiating action was essential. There were large differences in the amount of time and effort required to complete these steps for the various programs, primarily dependent upon the relative complexity of the issue and degree of public interest or controversy. For some provisions of the Act, plans were developed and implemented within the first year while, for others, plans are still being completed.

For planning and budgeting purposes, we have classified all CVPIA actions into one of eight action categories. We use these categories to summarize our activities in CVPIA reports, in discussions with the public and stakeholders, many who are interested in only certain facets of CVPIA implementation, and in coordinating with potential partners with interests in specific topic areas. Most of these eight categories involve several individual programs and related actions.

CVPIA Action Categories

- Administrative Processes
- Contracting and Improved Water Management
- Anadromous Fish - Habitat Restoration
- Anadromous Fish - Structural Measures
- Refuges and Waterfowl
- Other Fish and Wildlife Resources
- Studies, Investigations, and Modeling
- Monitoring

Priorities

Several factors are considered in establishing priorities for CVPIA actions. These include the importance of the action to achieving CVPIA program goals; its readiness or the amount of additional planning needed to implement the action; its cost effectiveness; and the availability of funding. Many provisions of the Act require plans or studies prior to taking action. In addition, administrative requirements, such as compliance with various State and Federal laws, must be undertaken before measures can be implemented. Finally, because the Act had specific compliance dates for some provisions, implementation was responsive to the prescribed dates.

Most of the CVPIA's provisions, however, have allowed us the discretion to implement in a purposeful, proactive manner those measures and programs deemed most important, most

urgent, or that would result in the greatest or most immediate benefit. This is especially true for the Act's fish and wildlife provisions. To help prioritize our efforts for fish and wildlife over the short-term, we have used a biological "focus area" approach that takes into account three parameters:

1. Species or populations of greatest concern;
2. Controllable factors that have the greatest influence on these species or populations; and
3. Geographic areas or habitats in most critical need of help for the priority species and/or for the greatest number of species.

Other biological considerations and principles applied in our implementation of the CVPIA include the emphasis in the Act itself on restoration of natural habitat components and ecosystem function and viability. Another is the emphasis on "focused packages" (suites of actions similar in nature in a specific geographic area) of projects to maximize and accelerate biological benefits in key geographic areas or watersheds instead of implementing measures in a scattered fashion over a wide geographic area. Critical non-biological principles include the technical feasibility and readiness of measures for implementation, and the support and availability of partners and funding to implement certain measures.

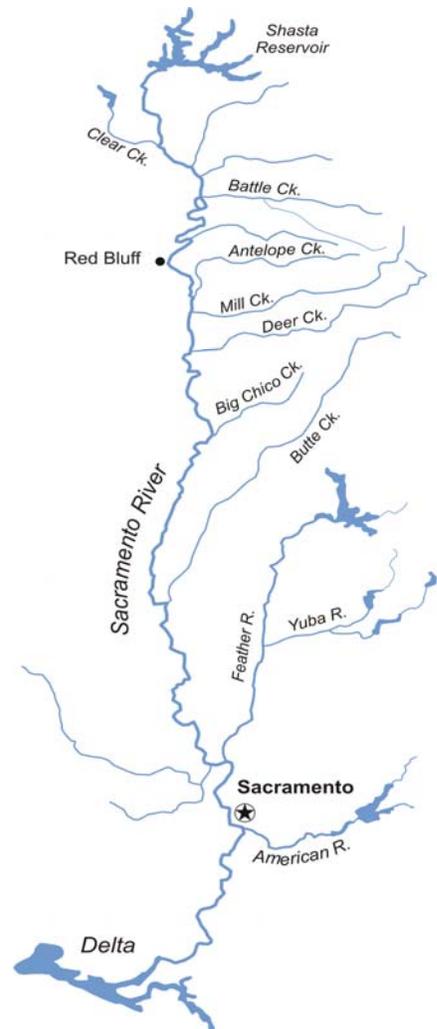
The Focus and Priorities for Anadromous Fish.

The CVPIA [Section 3406(b)(1)] directed us to develop and implement a program that makes all reasonable efforts to double, by the year 2002, the "natural" production of six species of anadromous fish in Central Valley rivers and streams over average levels that existed between 1967 and 1991. The majority of the other measures and programs in Section 3406(b) were intended to contribute to that effort.

Species of Anadromous Fish To Be Restored Under CVPIA

- Chinook salmon (all races)
- Steelhead
- Striped bass
- American shad
- White sturgeon
- Green sturgeon

Using the biological focus approach, the Delta has been determined to be one of the highest priority geographical areas for anadromous fish. The Delta has been highly altered by water resource development projects and operations. Still, all species and races of anadromous fish must pass through the Delta, both as adults moving upstream and as juveniles on their way to San Francisco Bay and the open ocean. In doing so, they pass close to and are greatly affected by the operation of water supply project facilities. The opportunity for



implementing measures in the Delta having widespread beneficial effects for all anadromous fish is tremendous. Emphasis there has been on increasing streamflows and reducing water diversions during peak periods in the out-migration of juvenile anadromous salmonids and when other threatened or endangered species, such as the delta smelt, are in the vicinity of the diversion pumps. Other operational changes and structural measures to enhance conditions during out-migration are also being employed.

The east-side tributaries of the Sacramento River are another major focus area for anadromous fish, in particular Butte, Deer and Mill creeks and, to a lesser extent, Big Chico Creek. These streams support the last significant runs of the threatened spring-run Chinook salmon. Once the most numerous race in the valley, the spring-run had dwindled to less than 2,000 fish in 1991. Dams have blocked access to the headwater areas of streams that once constituted their natural habitats, and flows needed to provide pools of cool water for them to survive over the summer (they migrate into the streams in spring and delay spawning until the fall) have been diverted. Restoration actions on these streams have emphasized the acquisition of water for instream flow, laddering or removal of dams and other impediments to migration, screening or removal of diversions, and acquisition and restoration of riparian habitats that provide relief from solar heating of the stream channel and woody debris and nutrients to the aquatic ecosystem.

Other Sacramento River tributaries, most notably Battle Creek, Clear Creek, Antelope Creek, and the Yuba River, have also been targeted for restoration efforts. Along with Deer, Mill, and Butte creeks, these streams support naturally spawning populations of steelhead, another listed threatened species. Juveniles of this species generally spend a year or more in their natal streams. Consequently, they are subject to many of the same limiting factors as the spring-run Chinook salmon, most notably the need to access the cooler upper reaches of streams and adequate supplies of summer water. Restoration efforts on these streams have focused on the same types of measures as for the spring-run Chinook on Butte, Deer, and Mill creeks.

The Focus and Priorities for Refuges and Waterfowl.

With the decline of natural wetlands in the Central Valley, wildlife specialists have been forced to intensively manage the remaining 300-400,000 acres of wetlands to accommodate the millions of wintering waterfowl, shorebirds, and other wetland-dependent wildlife that depend on them for survival. This has entailed careful management of limited and uncertain water supplies to provide for only the most critical of needs for a limited number of species. Some very difficult trade-offs of one species for another was the rule rather than the exception.

With the CVPIA's passage, we were directed to make available the water supply needed for full habitat development at specific Central Valley State and Federal refuges and private wetland

Central Valley Refuge Areas Receiving CVPIA Water

- Sacramento National Wildlife Refuge
- Delevan National Wildlife Refuge
- Colusa National Wildlife Refuge
- Sutter National Wildlife Refuge
- Gray Lodge Wildlife Area
- North Grasslands Wildlife Area
- San Luis National Wildlife Refuge
- Volta Wildlife Area
- Merced National Wildlife Refuge
- Los Banos Wildlife Area
- Grassland Resource Conservation District
- Mendota Wildlife Area
- Pixley National Wildlife Refuge
- Kern National Wildlife Refuge

areas. A base level of supply (referred to as Level 2 supplies) was made available immediately; the remaining portions of their full supply (referred to as Level 4 supplies) were to be made available in 10 percent increments over 10 years. The total amount of water to be supplied annually to the 14 refuge units is approximately 560,000 acre-feet (af), with limited reductions under certain hydrologic circumstances. CVPIA's increased refuge water supplies will enable managers to enhance existing habitats, expand their wetland base, and provide increased benefits to a greater number of wetland-dependent species.

The amounts of water to be supplied and the schedule for delivery were prescribed in the Act. In several instances, however, facilities to convey the requisite water supplies to the various wetland units were not in place. Consequently, the primary focus in the Refuge Water Supply Program has been to develop the necessary conveyance capacity, independently or through agreements with other parties, and to acquire the water to meet the prescribed needs.



In addition, a program was implemented to provide incentives to farmers to keep agricultural fields flooded during the winter months to provide greater amounts of habitat and increased food availability. Dubbed the Agricultural Waterfowl Incentives Program, it provided tremendous benefits at relatively low costs per acre by providing supplemental habitat and an expanded food base, helping to reduce disease by spreading birds out over a wider area. The primary focus was on fields with waste grain crops, primarily in the Sacramento Valley. Unfortunately, this program, with its conjunctive use of lands for agriculture and waterfowl, has expired.

The Focus and Priorities for Other Fish and Wildlife and Associated Habitats. The CVPIA directs us to make all reasonable efforts to address the environmental impacts of the CVP that are not specifically dealt with in the other provisions of the Act. However, identifying the impacts of the CVP some 50 years after it was initiated is problematic at best, especially for those indirect effects that were realized in the CVP service area. Our approach has been to initiate a habitat trends analysis to be used as one of several tools to determine what habitats, and consequently what species, experienced the greatest reductions over the last half-century in areas affected by CVP operations or water service. In the interim, while the data are gathered and analyzed, the focus of our efforts has been on habitat protection and restoration for those species in the CVP operations and service area that are in greatest need of assistance, primarily listed threatened and endangered species not addressed in other provisions of the CVPIA, some of which are on the verge of extinction. Emphasis has



been on habitat acquisition for protection and restoration of species such as the riparian brush rabbit, giant garter snake, vernal pool invertebrates, and San Joaquin Valley floor species like the San Joaquin kit fox, blunt-nosed leopard lizard, and several listed species of kangaroo rats. Concurrently, the CVPIA Land Retirement Program is acquiring land which, when retired from irrigated agriculture and restored or allowed to revert to natural conditions, will provide habitat for many of these same species.

Coordination

Cooperation through partnerships with others is essential to the CVPIA's success. We have developed many partnerships and extensive coordination linkages with local, State, and Federal agencies and private groups. These partnerships are with many previously existing programs as well as with programs and groups formed specifically to carry out CVPIA mandates. CVPIA implementation is closely coordinated with existing and ongoing restoration efforts such as the State of California's efforts to restore salmon and steelhead populations, the State Water Resources Control Board's (SWRCB) Water Quality Control Plan for the Delta, and the CALFED Ecosystem Restoration Program (ERP). In addition, most CVPIA restoration actions are developed and/or implemented in conjunction with local interest groups, many formed specifically for the purpose.

Coordination with the ERP is particularly important. Many of their actions have the same or similar objectives, and address the same natural resource and water management problems as the CVPIA. Close coordination and a focus on functional integration of both programs have helped us to achieve common goals and to avoid duplication. An example of this coordination is Interior's willingness and effort to have ERP scientists provide "expert level" review and comment on proposed CVPIA programs and actions. This review is expected to lead to a more broad-based ecosystem management strategy that more effectively addresses fish and wildlife mitigation, restoration, and enhancement, and assists in the selection of worthy projects

We have also encouraged the ERP and other potential partners to enter into cooperative relationships to implement appropriate CVPIA measures or to help achieve CVPIA goals and objectives through their own programs. Frequently, Interior will provide funds and services to these partners for them to undertake pre-approved restoration actions that help to attain CVPIA goals. At other times, funds from these other programs or partners are used to implement measures identified by CVPIA. Regardless of who implements which measures, Interior first assures that CVPIA funds are used only to meet CVPIA goals and objectives. Additionally, implementation of the CVPIA has routinely involved the CVP water and power users and other interested parties, including the discussion of priorities and efficient use of funds.

Funding Sources

Implementation of the prescribed actions and programs of the CVPIA through the first 12 years (1993 - 2004) has cost approximately \$759.4 million. Many of the measures implemented pursuant to CVPIA were already being planned or in progress at the time the Act was passed and a large portion of these expenditures would have occurred even in the absence of the CVPIA. These include the Shasta Temperature Control Device (\$84 million to implement but saving \$5 million per year in lost power generation), Glenn-Colusa Irrigation District Fish Screen Project (cost - \$41 million), rehabilitation of Coleman National Fish Hatchery (cost - \$21

million), and fixing the fish passage problems at the Red Bluff Diversion Dam (RBDD) (cost - \$42 million) and at the Tracy and Contra Costa Canal Pumping plants (cost - \$22 million). Other efforts, however, such as the Anadromous Fish Restoration Program (AFRP), Clear Creek Restoration Program, Spawning Gravel Replenishment Program, Anadromous Fish Screen Program (AFSP), Refuge Water Supply Program, and the Comprehensive Assessment and Monitoring Program (CAMP) became realities only because of CVPIA-provided funding.

Most of the \$759.4 million spent thus far has come from the Restoration Fund that was established in accordance with CVPIA Section 3407. These funds are derived from fees paid by the beneficiaries of the CVP's water and power supplies. The rest of the monies came from Reclamation's Water and Related Resources appropriations, from contributions provided by the State of California, and from donated funds.

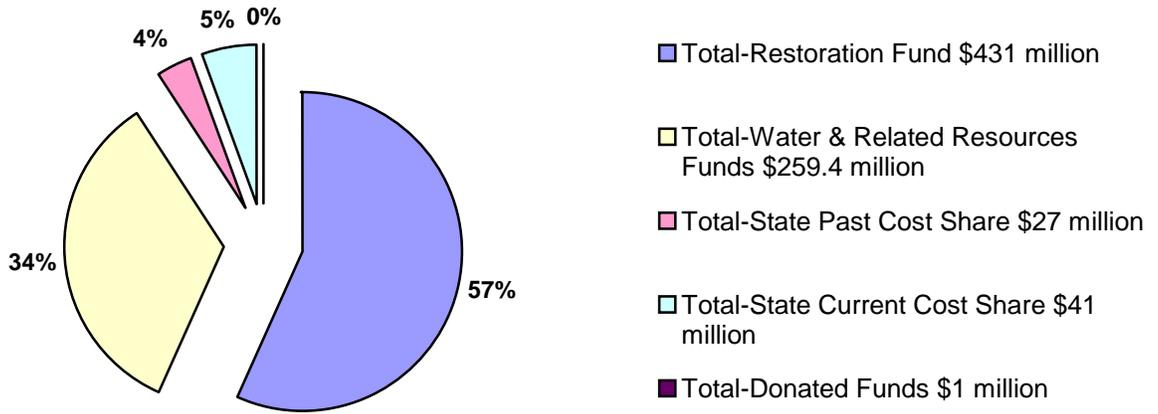
For FY 2004, more than \$66.5 million was allocated by Interior for the various CVPIA programs and actions. Nearly 60 percent of this allocation was provided from the CVPIA Restoration Fund.

Since its inception more than seven years ago, the ERP facilitated funding for a variety of projects contributing to ecosystem restoration within its geographic scope. The ERP is designed to maintain, improve, and increase aquatic and terrestrial habitats and improve ecological functions in the San Francisco Bay and Sacramento-San Joaquin Delta (Bay-Delta) to support sustainable populations of diverse and valuable plant and animal species. Most of the ERP's goals and geographic scope overlap with CVPIA goals. Thus, CALFED agencies have established a "Single Blueprint" for restoration and species recovery within the geographic scope of the ERP.

The Single Blueprint requires CALFED to integrate with numerous programs. With respect to CVPIA, there is much coordination between the Anadromous Fish Restoration Program, Anadromous Fish Screen Program, Dedicated CVP Water for Environmental Purposes, Clear Creek Program, Gravel Replenishment Program, and to a lesser extent, the Habitat Restoration Program. The Single Blueprint approach helps ensure coordination and integration, not only within the Bay-Delta Program, but between all resource management, conservation, and regulatory activities affecting the Bay-Delta system. As a result, many CVPIA projects receive leverage funding from the ERP program.

Figures 1 and 2 on page 13 show the obligations by fund source, Figure 1 for the 12-year period since FY 1993 and Figure 2 for FY 2004 alone. The largest portion of the monies obligated since 1993 have been spent on anadromous fish restoration-related structural measures, such as the Shasta Temperature Control Device and the Glenn-Colusa Irrigation District Fish Screen Project. These projects benefit the water and power users as well as anadromous fish. Large amounts were also obligated on habitat restoration measures for anadromous fish, measures believed necessary to help achieve our goal of doubling the natural production of these species, and on acquiring and providing water for refuges. On page 14, Figures 3 and 4, respectively, show the total distribution of these obligations among action categories for the entire FY 1993-2004 period and for FY 2004 alone.

**FIGURE 1
CVPIA OBLIGATIONS BY FUND SOURCE
Fiscal Years 1993-2004**



**FIGURE 2
CVPIA OBLIGATIONS BY FUND SOURCE
Fiscal Year 2004**

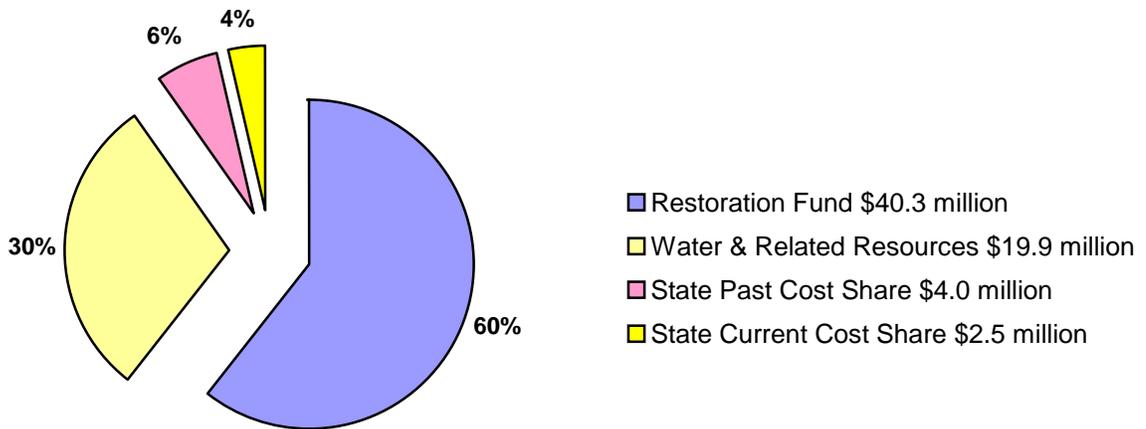


FIGURE 3
TOTAL CVPIA OBLIGATIONS BY ACTION CATEGORY
Fiscal Years 1993-2004

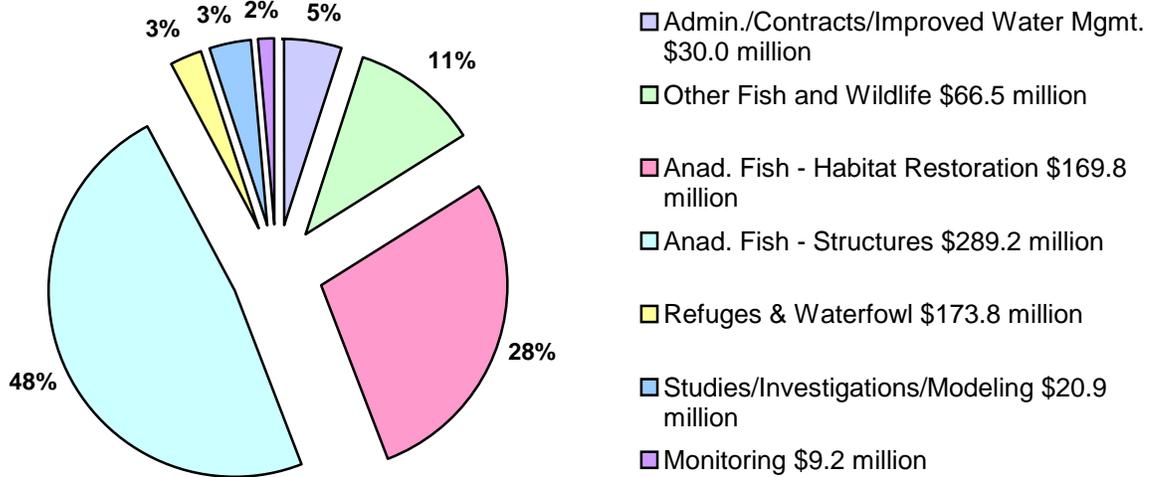
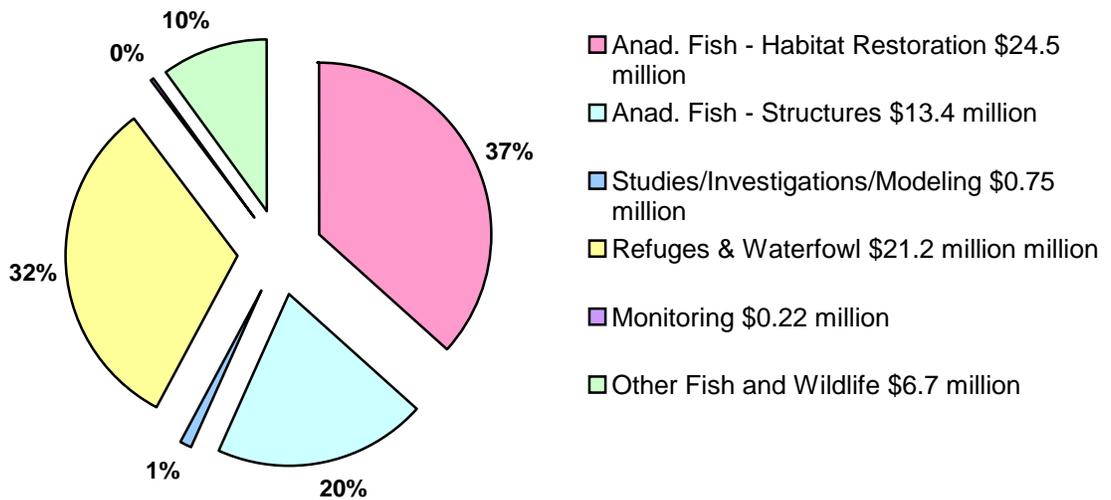


FIGURE 4
CVPIA OBLIGATIONS BY ACTION CATEGORY
Fiscal Year 2004



FISCAL YEAR 2004 ACCOMPLISHMENTS AND RESTORATION FUND DOLLARS OBLIGATED

Since its passage in 1992, Reclamation and the Service, with assistance of the State of California and the cooperation of many partners, have completed many of the CVPIA's provisions. These include many of the administrative requirements, water management and operational changes, and contracting and water conservation measures. Many studies and investigations have been undertaken and completed and hundreds of measures to benefit fish and wildlife resources and improve water project operations have been implemented. The following provides a brief discussion of the status of CVPIA programs and a general overview of our activities and accomplishments specifically in FY 2004.

Project Title: Anadromous Fish Restoration Program
CVPIA Section 3406(b)(1)

FY 2004 Funding: \$2,640,724

FY 2004 Accomplishments:

The CVPIA directed implementation of a program that makes all reasonable efforts to ensure that the average natural production of six species of anadromous fish in Central Valley rivers and streams will be sustainable, on a long term basis, at levels at least double that existing during the 1967-1991 period. Anadromous fish are those species that are born in freshwater but migrate to saline waters as juveniles, where they spend a large portion of their lives before returning to freshwater as adults to spawn. The six species targeted by the CVPIA are Chinook salmon (four distinct races), steelhead, striped bass, American shad, white sturgeon, and green sturgeon. With the goal of developing and implementing this provision, Interior established the AFRP.

All actions to achieve sustainable doubling of the natural production (doubling goal) of these species of anadromous fish were guided by the Final Restoration Plan (Plan) for the AFRP (Service, 2001) developed by AFRP staff in coordination with experts from many agencies and stakeholder groups. This Restoration Plan, finalized in 2001 after extensive input and public review, identified 6 general objectives necessary to achieve the doubling goal:

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; and
6. Involve partners in the implementation and evaluation of restoration actions.

The Plan identified the measures believed necessary to achieve the doubling goal for each significant stream in the Central Valley. Reported here are the actions to achieve that goal that were implemented and/or funded specifically under the AFRP. Other actions to improve conditions for these species of anadromous fish were funded and carried out under other provisions of the CVPIA. Twenty of the other 22 provisions in Section 3406(b) were intended to contribute to that effort. Actions under these other provisions, although guided by the Plan, are being carried out independently and reported separately.

Hundreds of AFRP restoration actions and evaluations were implemented since the passage of CVPIA to help achieve the CVPIA doubling goal for anadromous fish. All were extensively coordinated with local stakeholders in the various geographic areas and watersheds in which anadromous fish occur. In many cases, where local watershed groups did not previously exist, the AFRP worked to create them. All AFRP actions were coordinated with other agencies and other programs to avoid duplication and to make the most effective use of limited CVPIA funds. Of particular note was coordination with the ERP. The ERP has many of the same objectives as the AFRP. To enhance this coordination, proposed AFRP actions in recent years were submitted to the ERP review panels for their opinion on the priority and relative merit of the proposed action. Frequently, CVPIA and the ERP partnered in the implementation of measures. Other actions may be funded entirely by the ERP or CVPIA, regardless of which entity actually developed or solicited the proposal.

The AFRP restoration objective gap analysis for each of the Central Valley watersheds was presented in the FY 2003 and FY 2004 workplans. Although the AFRP identified approximately \$15.8 million in restoration projects for immediate development, sufficient funds were unavailable for this level of implementation. During FY 2004, the AFRP was limited to funding only ongoing projects (no new projects) due to a reduced budget.

FY 2004 AFRP funded actions and accomplishments, include the following:

Upper mainstem Sacramento River and upper Sacramento River tributaries

Ongoing project accomplishments

1. Mainstem Sacramento River watershed: (a) continued development of an environmental compliance and hydraulic evaluation of the La Barranca project (Phase II); and, (b) completed markers 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).
2. Continued assistance to the Cow Creek watershed management group in their watershed management plan proposal preparation. Completion of this plan will have incorporated all AFRP Restoration Plan actions and evaluations for Cow Creek that address limiting environmental factors to doubling anadromous fish populations in this stream.
3. On Cottonwood and Deer Creek watersheds, Habitat Restoration Coordinators (HRC) continued to provide coordination, technical guidance, and proposal development of the

CALFED Environmental Water Program (EWP) on Deer and Clear creeks, two of the five EWP priority streams.

4. Lower Butte Creek watershed: (a) continued funding Ducks Unlimited as the project manager of the Lower Butte Creek Project (LBCP), which has the objective of modifying five flow control structures and fish ladders to improve fish passage; (b) completed engineering designs and necessary environmental documentation on all five reaches of the LBCP; (c) completed Phase II on the Butte Sink and Sutter Bypass West Side reaches and nearing completion on the White Mallard and Associated Diversions reach of the LBCP; (d) developed a Memorandum of Understanding (MOU) between stakeholders and agency representatives to address the large number of small pumps and multitude of diversions and weirs located on Butte Slough and Sutter Bypass East; (e) constructed three weirs located on the west side of the Sutter Bypass; (f) constructed five water control structures in the Butte Sink; (g) initiated construction of two adult fish barriers; and, (h) negotiated purchase of a long-term water right for in-stream flows in the west side Sutter Bypass.
5. On the Feather River watershed, the Program evaluated limiting factors for sturgeon and salmon passage and spawning which is continuing through the FERC settlement process for Oroville Dam relicensing.

FY 2004 funded ongoing projects

1. On Butte and Big Chico creeks the Program provided additional funding for continued implementation of a 10-year salmonid life history study that evaluated the effectiveness of restoration projects relative to abundance, habitat use, growth, survival, fish passage, and many other factors. Some of the interim study findings include: (a) juvenile residency time in Butte Creek ranged from 56 days to 71 days in 1998 through 2000; (b) adult spring-run Chinook salmon (SRCS) escapement during 1999 and 2000 were 3,679 and 4,119 fish respectively, exceeding the 2000 fish doubling goal both years; and (c) ocean tag recoveries from Butte Creek adults captured in the commercial/sport fishery suggest that some portion of Butte Creek SRCS return to spawn as age four fish. Another particularly important study element will evaluate growth of juvenile salmon that rear and migrate through the Sutter Bypass compared to those that use the mainstem Sacramento River. These interim data serve as a basis for new restoration projects as well as provide a baseline for post-project evaluation of effectiveness. In addition, these data are being incorporated into the National Oceanic and Atmospheric Administration (NOAA) Fisheries spring-run Chinook salmon recovery effort, the fishery management plan conservation objectives for the Pacific Fishery Management Council, and the Interagency Ecological Program Sacramento River Delta Operations Plan.
2. Continued to assist locally led efforts to facilitate coordination of the Butte Sink/Sutter Bypass stakeholders as identified in #4 above. Other Project activities include Project tours, outreach and education and attendance of CBDA/ERP associated meetings.

3. Funded the permitting phase of the Drumheller Slough 5-points Screen Project. This project looks at the final alternative for the West of Butte Creek Drumheller Slough-5 points fish screen and alternative routing of the RD 1004 diversion from Butte Creek. The final plan will amend the existing Negative Declaration/FONSI and Biological Assessment.

Lower Sacramento River and Delta tributaries

Ongoing project accomplishments

1. Yuba River watershed: (a) replaced the existing temporary outlet barrier with a permanent "leaky-dike" barrier to prevent the migration of Yuba River Chinook salmon and steelhead into the Goldfields, which is an active dredger mining operation; (b) completed year one of tagging for juvenile life history study; (c) completed year one sampling for the Spawning Habitat Integrated Rehabilitation Approach which balances fish habitat needs with fluvial geomorphic process goals; and (d) continued negotiations with key lower Yuba River Stakeholders involved in the State Water Resources Control Board Revised Decision 1644.
2. American River Watershed: Initiated research to develop predictive tools that will: (a) reduce, to the extent possible, the uncertainties in the performance of identified temperature control actions that could be implemented to improve the management of cold water resources in the Folsom/Natoma Reservoir system and the lower American River, and (b) be available for daily operations, planning, and salmon and steelhead habitat studies by other project operators and other stakeholders. Completed first year of a two year project (completion date is September 26, 2005) sampling and modeling of the Lower American River temperature reduction modeling project.
3. Bear River watershed: (a) identified fish passage impediments on Dry Creek, tributary to Bear River; and (b) developed a baseline conditions study for the lower Bear River.
4. Calaveras River watershed: (a) completed fall-winter 2003-04 adult and juvenile Chinook salmon surveys downstream of Bellota Weir; (b) retrofitted Bellota Weir Fish ladder; and, (c) completed first year report of the Lower Calaveras River salmonid life-history study.
5. Cosumnes River watershed: (a) assessed flow requirements for upstream passage of adult fall-run Chinook salmon; (b) estimated flow augmentation needs and water sources to allow upstream salmon passage in the fall; and, (c) continued salmon barrier improvement work.
6. Mokelumne River watershed: (a) added 1,200 cubic yards of gravel in bar configurations perpendicular to flow as part of the first year of the Mokelumne River Spawning Habitat Improvement Project; (b) completed analysis of sediments above and below Murphy Creek to assess post-dam processes and changes, providing a baseline to minimize disturbances in downstream rearing areas; and, (c) completed two peer

reviewed UC Davis publications resulting from the interdisciplinary project approach to rehabilitate salmonid spawning habitat.

FY 2004 funded ongoing projects

1. In relation to the Mokelumne River Spawning Habitat Improvement Project, additional dollars were used to purchase gravel in 2004 and complete this two year project. Similar past investments in spawning habitat improvement have resulted in immediate increased utilization by Chinook salmon spawners. Similar results are anticipated with partnered investment with East Bay Municipal Utility District.
2. An interdisciplinary approach to gravel augmentation was implemented on the Mokelumne River. Funds were provided to manage a large volume of field data, coordinate it with other databases and transform it into easily understandable management information suitable for a variety of stakeholders. This funding will also allow modeling gravel movement at a wider range of flows to better estimate future gravel augmentation rates.

San Joaquin Basin tributaries and mainstem San Joaquin River

Ongoing project accomplishments

1. Stanislaus River watershed: (a) continued field testing and design modification of the Vaki infrared fish counter during the fall-run escapement from September 2003 through April 2004; (b) completed 50 percent of a draft plan to restore anadromous fish habitat in the Stanislaus River (<http://www.delta.dfg.ca.gov/srfg/>); (c) completed an annual rotary screw trap monitoring efforts at Caswell State Park; (d) progressing on environmental permitting for spawning and rearing, floodplain and side channel habitat restoration in the Lover's Leap and Knights Ferry reaches; (e) continued to plan and coordinate with USBR for spawning gravel introduction below Goodwin Dam; and, (f) completed riparian revegetation and floodplain restoration on the Mohler Tract.
2. Tuolumne River watershed: (a) continued channel and floodplain restoration at the 7/11 materials restoration site; (b) reviewed preliminary appraisals for the MJ Ruddy restoration project by Interior (restoration and construction is anticipated to start in July of 2005); (c) completed preliminary design engineering and environmental permitting on the Warner-Deardorff channel and floodplain restoration site in preparation for the CBDA funded and AFRP managed Warner-Deardorff restoration project; (d) initiated the environmental permitting, design engineering and pre-project monitoring at the Tuolumne Special Run Pool 10 site; (e) continued third-year post-project monitoring of the Grayson River Ranch floodplain restoration project (conservation easement) on the Tuolumne River; (f) developed an interpretive and education facility concept on the upper Tuolumne River with Stanislaus County; (g) amended Sediment Management Plan agreement to incorporate short term habitat needs and adaptive management methods to guide future gravel augmentation management practices; and (h) completed the Tuolumne River Technical Advisory Committee's scope of work for the Tuolumne River gravel transfusion project to include additional gravel supply methods.

3. Merced River watershed: (a) completed preliminary results 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) completed preliminary design engineering and landowner coordination at the lower Western Stones restoration site; (c) completed all three Adaptive Management Forum (AMF) reports (Tuolumne, Merced, and Clear Creek reports are available on the AFRP web site); (d) completed water temperature data assessment by Merced Irrigation (available on the AFRP web site); (e) purchased 20 water quality test kits to encourage landowner water testing in coordination with the East Merced Resource Conservation District; (f) initiated negotiations with the local mining industry concerning reclamation plans for Bettencourt Ranch mining project; and, (g) continued support of the Merced River Dredger Tailings Reach phase I adaptive management studies and restoration.
4. On the mainstem San Joaquin River, the San Joaquin River National Wildlife Refuge wetlands plans were incorporated into hydraulic modeling efforts funded by AFRP to evaluate proposed non-structural flood control management alternatives on the Refuge.
5. San Joaquin Basin: (a) completed 75 percent of a California Department of Fish and Game (CDFG) riffle atlas study to provide a comprehensive San Joaquin Basin riffle inventory; (b) completed draft feasibility study report for developing a long-term aggregate source for San Joaquin tributary channel restoration projects; (c) completed 80 percent of a CDFG study to read archived Chinook salmon scale samples from the San Joaquin Basin to be used to update a salmon population model that assists alternative flow management evaluations on the tributaries.
6. Comprehensive program accomplishments included: (a) renovation of existing website to provide more user-friendly access to information; and, (b) updating and expanding scope of information available on the web site.

FY 2004 funded ongoing projects

1. The Two Mile Bar spawning habitat/floodplain restoration project (Phase 1) will restore the floodplain and sediment processes in a critical spawning and rearing reach of the Stanislaus River. Environmental permitting is underway to include floodplain and side-channel restoration. The California Department of Water Resources (CDWR) has contributed \$500,000 to the project through the Four Pumps Mitigation effort.
2. Chinook salmon and steelhead life history evaluation was continued to include 2004 analysis and reporting of fish passage data (e.g., VAKI).
3. In an effort to develop data needs, AFRP funded: (a) data development for a sediment study on Murphy Creek, a tributary to the Mokelumne River; (b) Merced River stakeholder group facilitation; (c) a mineral appraisal for MJ Ruddy project on the Tuolumne River, (d) project proposal preparations; and, (e) an adjustment to a Tuolumne River sediment management plan to include steelhead.

Project Title: Evaluation of Anadromous Fish Instream Flow Needs

CVPIA Section 3406(b)(1)(B)

FY 2004 Funding: \$480,165 (provided by AFRP)

FY 2004 Accomplishments:

In directing Interior to make all reasonable efforts to at least double the natural production of anadromous fish, Congress recognized the need for flows of suitable quality, quantity, and timing in those streams that support these species. It specifically directed that the instream flow necessary to protect all life stages of anadromous fish on CVP-controlled streams be determined by the Service after consultation with CDFG. However, to achieve the goal of doubling the natural production of anadromous fish throughout the Central Valley, the flow needs of these species on other Central Valley streams and rivers must also be ascertained so that actions may be taken to provide for those needs. Instream flow studies had already been conducted on several streams. With the passage of the CVPIA, those previous evaluations are being reviewed and additional studies conducted. These efforts have been under way for several years and will continue for several more.

FY 2004 accomplishments were documented in the annual status report entitled "Identification of the Instream Flow Requirements for Anadromous Fish in the Streams within the Central Valley of California" for the following seven tasks. Task 1 addressed steelhead spawning and Chinook salmon and steelhead rearing in the Yuba River; Tasks 3 and 4 addressed Chinook salmon and steelhead rearing in the Yuba River, and Chinook salmon and steelhead spawning in Clear Creek; and Tasks 5 and 6 addressed Chinook salmon spawning in the Sacramento River between Battle Creek and Deer Creek, and juvenile Chinook salmon rearing in the Sacramento River between Keswick Dam and Battle Creek.

1. Habitat Suitability Criteria (HSC) Development - Completed collection of spawning HSC data for fall- and spring-run Chinook salmon and steelhead/rainbow trout in the Yuba River in FY 2004. We continued collecting rearing HSC data for fry and juvenile fall/spring run Chinook salmon and steelhead/rainbow trout in FY 2004. Spawning HSC data collection is 100 percent complete and rearing HSC data collection is 60 percent complete.
2. Habitat Mapping - There were no activities for this task in FY 2004. Habitat mapping for the Yuba River was completed in FY 2003, and habitat mapping for Clear Creek will be conducted in FY 2005.
3. Field Reconnaissance and Study Site Selection - Established eight study sites for Chinook salmon and steelhead/rainbow trout fry and juvenile rearing in the Yuba River, and established five study sites for Chinook salmon and steelhead/rainbow trout spawning in Clear Creek. The above activities are 100 percent complete.
4. Hydraulic Data Collection - Continued hydraulic data collection for Chinook salmon and steelhead/rainbow trout spawning sites on the Yuba River and started hydraulic data collection for Chinook salmon and steelhead/rainbow trout fry and juvenile rearing sites on the Yuba River and Chinook salmon and steelhead/rainbow trout spawning sites on Clear Creek. All of the above hydraulic data collection should be

completed in FY 2005. Hydraulic data collection is 95 percent complete for Yuba River spawning, 80 percent complete for Yuba River rearing, and 90 percent complete for Clear Creek spawning.

5. Modeling of Spawning and Rearing Habitat in Study Streams - Modeling of fall-run Chinook salmon spawning habitat in the Sacramento River between Battle and Deer Creeks began in FY 2004. Modeling of rearing habitat in the Sacramento River between Keswick Dam and Battle Creek was nearly completed (greater than 95 percent) in FY 2004, and will be 100 percent completed in early FY 2005.
6. Peer Review - There was no activity for this task in FY 2004. The report for rearing habitat in the Sacramento River between Keswick Dam and Battle Creek will be peer reviewed in FY 2005.
7. Program Management - Project coordination meetings were held and a project progress report was prepared in FY 2004. This activity is 50 percent complete.

Project Title: **Habitat Restoration Program**
CVPIA Section 3406(b)(1) "Other"
FY 2004 Funding: **\$1,430,614**
FY 2004 Accomplishments:

The Habitat Restoration Program (HRP) was established to protect and restore habitats impacted by the CVP that were not specifically addressed elsewhere in the CVPIA and to stabilize and improve populations of native species that relied on those habitats. The program's initial focus was on those habitats known to have experienced the greatest decline in habitat quantity and quality and on species that were listed, proposed, or candidates for listing under the ESA or were non-listed State or Federal species of special concern.

The program began in FY 1996 and has funded 69 projects located throughout the Central Valley at a cost of approximately \$21.2 million. Approximately 98,179 acres of habitat for listed, proposed, and candidate species and species of special concern have been protected, often through partnerships with others in fee title acquisitions or conservation easements. Habitats protected include vernal pool, aquatic, alkali scrub, foothill chaparral, valley-foothill hardwood, and grassland.

In FY 2004, eight conservation actions were funded. Two of these actions provided additional funding to continue projects that were initiated in previous years. These are continued monitoring for giant garter snakes at the habitat restoration site that the program funded at the Colusa National Wildlife Refuge and trapping and surveying for giant garter snakes at the San Luis National Wildlife Refuge.

The six actions that were new to the program and funded in FY 2004 include the following:

1. Funds were provided for the Adaptive Vegetation Management on Serpentine Soils Study, to assess grazing impacts on native serpentine plant species on Coyote Ridge in

Santa Clara County. Developing this information and applying it in adaptive land management are priority tasks for recovery of the bay checkerspot butterfly, Santa Clara Valley dudleya, Metcalf Canyon jewelflower, and other species.

2. Funds were provided to the Nature Conservancy for riparian restoration on 206 acres on the Ohm property along the Sacramento River in Tehama County. Species that would benefit include the valley elderberry longhorn beetle and bald eagle.
3. Funds were provided to River Partners for the Drumheller Slough Riparian Restoration project. Riparian restoration would occur on 226 acres on Drumheller Slough within the Sacramento River National Wildlife Refuge in Glenn County. The valley elderberry longhorn beetle and giant garter snake would benefit.
4. Funds were provided to the Bureau of Land Management for fee title acquisition of 5,810 acres of the Ansin property, located inside and outside of the Carizzo Plain National Monument in Kern County. Habitat is comprised of alkali scrub, saltbush scrub, and semi-desert scrub. Species that would benefit include the San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin woolly threads, and Kern primrose sphinx moth.
5. Funds were provided to the Trust for Public Lands for fee title acquisition of 708 acres of oak woodland and riparian habitat at the mouth of Fine Gold Creek, tributary to the San Joaquin River in Madera County. Species that would benefit include the valley elderberry longhorn beetle, bald eagle, and California tiger salamander.
6. Funds were provided to the Central Valley Habitat Joint Venture for buy-in to a habitat restoration “clearinghouse” webpage and to gain access to valley-wide project data.

Project Title: San Joaquin River Riparian Habitat Restoration Program
CVPIA Section 3406(b)(1) “Other”

FY 2004 Funding: \$715,732

FY 2004 Accomplishments:

The San Joaquin River Riparian Habitat Restoration Program (SJRRHRP) is a consensus-based group of Federal, local, and non-governmental organizations that have an interest in restoring riparian habitat on the San Joaquin River. The SJRRHRP was formed in 1997 at the request of the non-Federal litigants engaged in discussions about mutually acceptable restoration activities on the San Joaquin River in conjunction with the *Natural Resources Defense Council (NRDC) v. Rodgers* lawsuit. Reclamation and the Service, the Friant Water Users Authority (FWUA), NRDC, and Pacific Coast Federation of Fishermen’s Associations were the original parties. In subsequent years, the San Joaquin River Exchange Contractors Water Authority also became involved. The SJRRHRP provides funding for proposed and on-going efforts to gather data and/or disseminate information that will support the restoration of riparian habitat and functions along the San Joaquin River.

When the FWUA and NRDC were actively conducting their San Joaquin River restoration and water supply investigations, the SJRRHRP provided assistance on the experimental programs and activities that supported the data gathering necessary for their *NRDC v. Rodgers* settlement discussions. With the FWUA and NRDC settlement discussions now terminated, FY05 activities would most likely provide support for Reclamation, Service and CDWR San Joaquin River related planning activities.

FY 2004 actions funded and accomplishments include the following:

1. CDFG initiated a 4-year Milburn-Hansen Restoration Planning Project. CDFG, in coordination with CDWR, will be conducting the planning, pre-design, biological surveys, engineering, re-vegetation planning, environmental analysis, and public outreach activities necessary to outline a restoration plan for the abandoned aggregate mining pit areas in the Milburn Unit and the state-owned lands adjacent to Hansen Farm property.
2. CDFG initiated a 2-year Fishery and Aquatic Resources Inventory. CDFG will inventory and document the present-day status, distribution, and condition of aquatic fauna and flora between Friant Dam and the confluence of the Merced River. The documentation will include water condition information pertinent to interpretation of the inventory results.
3. Point Reyes Bird Observatory (PRBO) continued their 3-year monitoring program that is a collection of baseline data. Annually from 2003 through 2006, PRBO will provide baseline information on riparian bird communities including presence-absence, habitat associations, density (birds per acre), and some demographic indices (fidelity, productivity, and survivorship) to measure population health along the mainstem of the San Joaquin River from Friant Dam to the confluence of the Merced River. This effort builds upon the bird monitoring activities PRBO conducted for SJRRHRP in 2002.
4. U.S. Department of Energy, Lawrence Berkeley National Laboratories (LBNL) designed and installed additional water quality monitoring systems at various points along the San Joaquin River. LBNL will also make recommendations on a water quality monitoring and decision support system for the San Joaquin River between Friant Dam and the confluence of the Merced River. Monitoring equipment installation is to be completed by December 2004.
5. California State University B Stanislaus Foundation, Endangered Species Recovery Program (ESRP) continued gathering the terrestrial biological surveys and related studies that were initiated in 2000. ESRP is conducting surveys for valley elderberry longhorn beetles (and their habitat), small mammals (especially kangaroo rats), canids (especially San Joaquin kit foxes), and other species upon request.
6. Funds were provided to obtain a variety of clean up materials and to cover the trash and tire disposal fees for a San Joaquin River cleanup efforts led by the City of Firebaugh in recognition of the April 2004 "Keep California Beautiful" campaign and a clean up led

by RiverTree Volunteers in recognition of the May 2004 "National River Clean Up Week", the September 2004 "California Coastal Commission's Clean Up Day" and the federal "National Public Lands Day."

7. National Park Service, in cooperation with the National Film Arts Foundation, completed an oral history film documentary "Jewel of the San Joaquin - Andrew Firebaugh Historical Park, Firebaugh, California." It portrays the City of Firebaugh's role and significance to the San Joaquin River.
8. The review and completion of the Biological Assessment and Section 7 consultation with the Service on the Jensen River Ranch restoration planning effort was completed.
9. Information was obtained that identified what would be required, on a demonstration level, to reduce the amount of aquatic invasive species (e.g. Parrot's Feather) in the San Joaquin River downstream of Friant Dam.
10. An inventory and compilation of all Riparian Program-funded documents prepared by contractors and Reclamation staff was completed.

Project Title: Management of Dedicated CVP Water for Environmental Purposes

CVPIA Section 3406(b)(2)

FY 2004 Funding: \$704,565

FY 2004 Accomplishments:

On October 6, 1999, Interior released its "Final Decision on Implementation of Section 3406 (b)(2)." That decision, and its accompanying attachments, provided a calculation of CVP water, identified the method of accounting for use of the dedicated CVP water pursuant to CVPIA, set out procedures for management of the water, and listed potential measures which may be prescribed by the Service for use of the dedicated water. However, a decision by the Federal District Court in March 2002 ruled that portions of Interior's accounting methodology were erroneous. Consequently, Interior revised its procedures for accounting and managing the dedicated CVP water to comport with the Courts' rulings and, in May 2003, issued a "Final Decision on Implementation of Section 3406 (b)(2)." This new decision was implemented beginning in October 2003.

Reclamation, Service, NOAA Fisheries, CDWR and CDFG established an Environmental Water Account (EWA) to provide protection (supplemental to a baseline level of protection) to the fish of the Bay-Delta estuary. The management of the (b)(2) water is part of that baseline and is closely coordinated with the management of the EWA.

In FY 2004, work continued on an updated Operations, Criteria and Plan (OCAP) and OCAP Biological Assessment. A non-jeopardy biological opinion for the delta smelt was issued by the Service on July 30, 2004. The updated OCAP includes the revised decision on implementation of the dedicated water, the EWA, the Freeport diversion, and the California Aqueduct-DMC

intertie. This biological assessment also included as early consultation the South Delta Improvement Program which included the pumping of 8,500 cfs at Banks pumping plant.

The "Final Decision on Implementation of Section 3406(b)(2)" from May 2003 was implemented for the first year and coordinated with the fourth year implementation of the EWA. These measures contributed to the CVPIA's goal of doubling natural production of anadromous fish and provided concurrent benefits to other fish and wildlife, including endangered species. Monitoring and evaluation to assess the effectiveness of the implemented (b)(2) environmental measures continued.

FY 2004 accomplishments include the following:

1. Prepared annual operations forecast representing the 1992 baseline conditions and the 1995 Water Quality Control Plan conditions. An annual (b)(2) fishery action plan was prepared based upon the operations forecast and consultation with other Federal and State agencies. A final operations forecast was then developed, and the forecast was updated on a monthly basis.
2. Developed a preliminary accounting of (b)(2) water on the 15th day of every month, showing the current accounting for the accounting year as of the end of the previous month. Final accounting for all (b)(2) actions for the entire water year was calculated by October 31.
3. Reviewed an updated Operations Criteria and Plan (OCAP) for CVP and SWP in support of Bay-Delta Actions. The OCAP addressed the Bay-Delta and Coordinated Operations Agreement (COA) obligations and reflected the AFRP, the (b)(2) and EWA implementation scenarios, in addition to operational modifications, such as the South Delta Improvement Program (8,500 cfs), Trinity Record of Decision (ROD) flows, DMC/CA intertie, etc.
4. Included stakeholders and public input on the annual (b)(2) fishery action plan and how the plan was integrated into the operations forecast. Stakeholders as well as the public were included in Revised Decision and the updated OCAP.
5. Continued monitoring and evaluation that assessed the effectiveness of (b)(2) measures.
6. Evaluated the computer model to assess various (b)(2) implementation scenarios and integration of preliminary water acquisition decisions developed in FY 2001 implementation strategy. The evaluation contributed to an integrated environmental water plan, including level 2 and level 4 refuge water supplies.

Project Title: Water Acquisition Program
CVPIA Section 3406(b)(3)

FY 2004 Funding: \$14,614,545

FY 2004 Accomplishments:

The CVPIA Water Acquisition Program is charged with the responsibility of obtaining, by various means, water to supplement the 800,000 af of dedicated CVP water and to assist in meeting the CVPIA requirements for refuge water needs (approximately 159,000 af for Level 4 refuge water supplies). In FY 2004, the Water Acquisition Program continued efforts to:

1. Provide supplemental water supplies for refuges, referred to as Incremental Level 4, for critical wetland habitat supporting resident and migratory waterfowl, threatened and endangered species, and wetland dependent aquatic biota.
2. Investigate the potential of using groundwater resources, including conjunctive use, to augment Incremental Level 4 supplies.
3. Acquire instream flows in support of the Vernalis Adaptive Management Plan (VAMP) and the San Joaquin River Agreement (SJRA).
4. Coordinate planning efforts for instream acquisitions under CVPIA with the CALFED Environmental Water Program and Environmental Water Account to provide fishery benefits.

Outstanding issues to address include financial constraints on the acquisition of 100 percent of Incremental Level 4 supplies due to the increasing price of water and inadequate funding due to limits of the Restoration Fund. A summary of water purchases and executed agreements for FY 2004 is provided in the following table:

Delivery Period	Seller	Quantity (AF)	Cost	Cost per AF	Purpose
Oct 03	Merced I.D.	12,500	\$806,875	\$65	Fall attraction flows and habitat improvement in Merced River and lower San Joaquin River (SJR) per SJRA. (FY03 Funds)
Apr-May 04	SJR Group Authority	65,591	\$4,384,786	N/A	Spring Flows per SJRA/VAMP
Apr-Sep 04	SJR Group Authority/ Oakdale I.D.	15,000	\$900,000	\$60	Flow for habitat improvement in Stanislaus and lower San Joaquin Rivers (FY03 Funds)
Jul - Sep 04	Oakdale I.D.	5,120	\$307,200	\$60	Oakdale I.D. difference water from VAMP 2004 (per SJRA). (FY03 Funds)
Jan - May 04	N/A	N/A	\$283,000	N/A	VAMP environmental monitoring
Apr 04-Feb 05	Broadview Water District	5,400	\$594,000	\$110	Level 4 refuge water, contract year 2004
Apr 04	Del Puerto Water District	2,100	\$136,500	\$65	Level 4 refuge water, contract year 2004

Delivery Period	Seller	Quantity (AF)	Cost	Cost per AF	Purpose
May 04-Feb 05	Patterson Irrigation District	10,000	\$1,000,000	\$100	Level 4 refuge water, contract year 2004
May - Dec 04	San Joaquin River Exchange Contractors Water Authority	47,200	\$6,136,000	\$130	Level 4 refuge water, contract year 2004
TOTALS		162,911	\$14,548,361		

- Total cost for Fiscal Year 2004 includes funds obligated in Fiscal Year 2003.

Project Title: Tracy Pumping Plant Mitigation Program
CVPIA Section 3406(b)(4)

FY 2004 Funding: **\$3,401,423**

FY 2004 Accomplishments:

The goal of the Tracy Pumping Plant Mitigation Program is to mitigate the impacts associated with the operation of the Federal Tracy Pumping Plant in the Delta. The current objectives are to improve fish protection and fish salvage at the facility in the short-term while determining the best practical fish protection technology for incorporation into long-term improvements at the facility. To help accomplish this, the CALFED South Delta Fish Facility forum (SDFF) has been meeting and establishing guidelines for how best during these times to accomplish these goals and objectives.

One of the decisions the SDFF was faced with was whether or not to proceed with a test facility (TFTF) at Tracy. The SDFF decided to hold off on a test facility at this time until some final decisions could be made on what's needed to satisfy the regulatory agencies related to increased exports and fish protection in the south Delta. It is not anticipated at this time that a test facility will be constructed at Tracy, if at all, for a least a few years.

In addition, research on fish protection technology and improvements to existing operations is ongoing at Reclamation's Denver research labs, at the existing Tracy Fish Protection Facility, and at the University of California-Davis.

FY 2004 accomplishments include the following:

1. Laboratory evaluations of the TFTF fish sorting and holding physical model.
2. Leaky louver and fish sorting studies in Denver's large experimental flume.
3. Studies on tracking predator fish movements inside fish salvage facilities using remote telemetry.
4. Evaluation of the Tracy mitten crab traveling screen as a potential device for continuous woody and leafy debris removal.

5. Continuation of swirl tests to assess stress levels of salvaged fish held in recessed collections tanks.
6. Whole facility evaluations utilizing Delta smelt and salmon.
7. Deployment of a technical web site.
8. Final decision on proposed test facility.

The research activities noted above provided valuable information towards improvements in fish protection at the South Delta fish facilities (both the CVP and SWP).

Project Title: Contra Costa Canal Pumping Plant Fish Screen Project
CVPIA Section 3406(b)(5)

FY 2004 Funding: \$39,829

FY 2004 Accomplishments:

This Program will provide for construction and operation of new fish screen and recovery facilities and for modification of operations and practices at the Contra Costa Canal Pumping Plant. This directive is consistent with and supports an earlier ESA Section 7 Biological Opinion (BO) for the delta smelt that was issued by the Service for the Los Vaqueros Project.

In 1996, the Contra Costa Fish Screen Management Team and the Contra Costa Technical Advisory Committee were established, consisting of representatives from CDFG, CDWR, the Service, Reclamation, NOAA Fisheries, and the Contra Costa Water District. These two groups have been assisting in planning and developing a fish screen project for the Rock Slough intake of the Contra Costa Canal. In addition, there is a Peer Review Team that has helped to review planning and design documents and a Value Engineering Team that explored cost saving alternatives.

In FY 2003, the interagency team developed an expanded fish-monitoring program, which was implemented in FY 2004. In addition, with the development of alternative short-term fishery mitigation measures, Reclamation presented these measures to the Service, NOAA Fisheries, and CDFG, with a request for an amendment to the Los Vaqueros BO for delta smelt. The amendment extended the date for completion of the Rock Slough fish screen project through December 2008. There is also the possibility of re-initiating formal consultation and additional mitigation requirements.

Although final design and construction of a major project at the Contra Costa Canal Pumping Plant will await the results of the Contra Costa Water District's studies and response from the fishery agencies on amendment of the BO, a short-term mitigation preliminary design was developed in FY 2004 and presented to regulatory agencies.

Project Title: **Flow Fluctuation/Reservoir Storage Management Program**
CVPIA Section 3406(b)(9) and (19)

FY 2004 Funding: **\$25,722**

FY 2004 Accomplishments:

CVPIA Section 3406(b)(9) requires development and implementation of a program to eliminate, to the extent possible, losses of anadromous fish due to flow fluctuations caused by operation of any CVP storage or re-regulating facility. This program is to be patterned, where appropriate, after the agreement between CDFG and CDWR, with respect to the operation of the SWP's Oroville Dam complex. Closely related to this charge to reduce the impacts of flow fluctuations, CVPIA Section 3406(b)(19) calls for the re-evaluation of reservoir storage criteria in order to maintain minimum carryover storage in Shasta and Trinity Reservoirs to benefit anadromous fish, with full regard to the Secretary's responsibility to fulfill all project purposes, including agricultural water delivery. Interior's efforts on both of these directives are generally handled as a single program. However, there was no funding specifically allocated for reservoir storage (b)(19), under 3406(b)(2) reservoir storage was studied in FY 2004.

The final report of the flow fluctuation study of the impacts of Folsom Dam operation on salmon and steelhead in the lower American River, done under contract by CDFG, was released in December 2001. The American River Operations Work Group met monthly throughout FY 2004 to discuss both the American River operations and to determine threshold flows and ramping rates required to protect Lower American fishery resources. In addition, Reclamation conducted monthly temperature modeling of the flows of the American River.

The Stanislaus River flow fluctuation study was started in 1999 and is currently ongoing. The early draft report of that study was released in July 2004. The Stanislaus River Operations Group no longer holds regularly scheduled meetings to discuss flow and temperature issues; however, many flow and temperature issues are discussed at the regular monthly meetings of the Stanislaus River Fish Group. More regular discussions of the Operations Group are held in the April/May period when the pulse flows for the VAMP are being planned and implemented. These pulse flows include releases from New Melones Reservoir on the Stanislaus River.

Project Title: **Red Bluff Diversion Dam Fish Passage Program**
CVPIA Section 3406(b)(10)

FY 2004 Funding: **\$4,449,998**

FY 2004 Accomplishments:

CVPIA Section 3406(b)(10) requires the development and implementation of measure to minimize fish passage problems for adult and juvenile anadromous fish at the Red Bluff Diversion Dam (RBDD) in a manner that provides for the use of associated CVP conveyance facilities for delivery of water to the Sacramento National Wildlife Refuge Complex.

The formulation of alternatives in the first four years of the RBDD Fish Passage Planning Program has led to the general recognition that operations implemented as directed in the 1993 BO for winter-run Chinook salmon are very effective in improving passage of fish with the possible exception of the adult spring run Chinook. The increased duration of gate removal at

RBDD prompted by the BO dramatically improved baseline conditions for both juvenile and adult anadromous salmon and changed the standard against which additional measures to minimize fish passage problems would be measured. Although an estimated 80 percent of the adult spring run passing the RBDD are still delayed, it is unclear that this currently limits the recovery of this run in the upper Sacramento River and its tributaries although additional information may be provided as part of the OCAP BO.

As a result, the benefits of further investments appear to be unknown pending acquisition of better data on the affects of dam operations on adult spring-run Chinook, but would appear to be low. However, State and Federal investigations of off-stream storage adjacent to the Tehama-Colusa Canal as part of a long-term solution to ecosystem restoration and water supply reliability problems could lead to eventual elimination of fish passage issues at Red Bluff by warranting the construction of a pumping plant capable of year-round operation.

In FY 2002, a draft BA and a draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the RBDD Fish Passage Program Improvement Project were prepared and made available for public review. The document focused on structural alternatives for the solution of the fish passage problem at RBDD, and all would cost on the order of 80-100 million dollars for both fish passage improvements and the construction of an all-year round pumping plant. Work on these documents was suspended pending completion of a new ESA Section 7 consultation on the OCAP for the CVP as a whole but is expected to be re-initiated in FY 2005.

In FY 2004, the fourth pump was designed and the contract was awarded for installation. The pump is expected to be complete in FY 2006, with the components needed for successful water delivery and fish bypass to the river.

In FY 2004, discussions on the various alternatives for solution of the fish passage/water delivery problems at RBDD by the Fish Passage Program's Study Management Group continued. The Study Management Group consists of representatives from Reclamation, the Service, NOAA Fisheries, CDFG, and CDWR. Engineers from Reclamation's Denver Technical Service Center made a site visit to the pumping plant to gather information for the preliminary design.

Project Title: Clear Creek Restoration Program

CVPIA Section 3406(b)(12)

FY 2004 Funding: \$579,193

FY 2004 Accomplishments:

This section of the Act requires the restoration of Clear Creek, construction of a new fish ladder at the McCormick-Saeltzer Dam, and the development and implementation of a comprehensive program to provide flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead from Whiskeytown Dam.

Since the removal of McCormick-Saeltzer Dam and its diversion from Clear Creek in 2000, efforts on Clear Creek have been re-focused on improvement of instream habitat conditions for anadromous salmonids.

In FY 2004, the activities and accomplishments of the Clear Creek Restoration Program included:

1. Implementation of the Clear Creek Stream channel restoration project. This project is restoring natural geomorphic form and process to the creek. Fisheries monitoring showed a 3.6 fold increase in Chinook salmon spawning density in the newly completed Phase 3A. In addition, migratory songbird diversity and population sizes are increasing in the restoration area. Topographic surveys and mercury characterization were conducted for Phase 3B. Mercury characterizations conducted by the University of Montana and the U.S. Geological Survey indicated that the project had no adverse impacts on mobilizing or increasing mercury concentrations in the creek.
2. Implementation of salmon-friendly flows. These flows were partially responsible for the third highest fall-run Chinook salmon escapement on record. Recommendations for flows between June and September were suggested to maintain water temperatures that met the standards established by NOAA Fisheries for the protection of the endangered spring-run Chinook and steelhead. Recommendations were also made for flows between October and May to provide adequate spawning and rearing habitat for Chinook and steelhead. IFIM studies were used to determine long-term flows necessary to satisfy requirements of (b)(12). The Clear Creek Decision Analysis and Adaptive Management Model were improved to evaluate power, sediment, riparian and salmonid impacts from large managed releases of water.
3. Implementation of the spawning gravel augmentation and monitoring program. Approximately 4,768 tons of spawning gravel was injected below Whiskeytown Dam. Monitoring indicated that federally listed as threatened spring-run Chinook salmon and steelhead were utilizing injected gravel for spawning areas.
4. Continuation of Clear Creek monitoring efforts. Monitoring included juvenile salmonid use of restored habitats, fish stranding, adult population estimates, and redd mapping. Stream flows, water temperatures, spawning gravel, and stream substrate quality were also monitored in FY 2004.

Project Title: **Spawning Gravel Replenishment Program**
CVPIA Section 3406(b)(13)

FY 2004 Funding: **\$675,673**

FY 2004 Accomplishments:

The CVPIA directs that a program be established to replenish spawning gravels for anadromous fish that have been lost as a result of the construction and operation of the CVP, bank protection projects, and other activities on the Sacramento, American, and Stanislaus Rivers. The Spawning Gravel Replenishment Program has been established and, in the years since CVPIA enactment, has placed more than 135,000 tons of gravels in these streams to increase the availability of spawning gravel and rearing habitat for Chinook salmon and steelhead. In addition, existing gravel substrates on the American River have been ripped and manipulated to make them more usable for these purposes.

Beginning in 1997, salmonid spawning gravel has been placed twice on the right bank of the mainstem Sacramento River immediately downriver from Keswick Dam, three times on the right bank immediately downstream from the confluence with Salt Creek, and once on the left bank on the Tobiasson property toward the southern extent of the Redding city limits. Subsequent high river flows dispersed the gravel downriver. Salmon have been observed on the restored habitat.

The substrate at three riffles on the lower American River has been manipulated and salmonid spawning gravel subsequently placed at these sites in 1999 according to specifications. Salmon have been observed spawning on the restored habitat. Monitoring is under way to determine salmonid use of the gravel placed in the river.

Also beginning in 1997, salmonid spawning gravel has been placed in the Stanislaus River at three different sites immediately downriver from Goodwin Dam. On two occasions, helicopters were used to deposit the gravel directly in the channel. This work was supplemented with gravel delivered by truck to areas adjacent to the channel, then pushed into the river channel. The gravel was subsequently dispersed downriver by streamflow. Salmon have been observed spawning on the restored habitat. Monitoring is under way to determine salmonid use of the gravel placed in the river.

Accomplishments for the gravel replenishment program in FY 2004 include the following:

1. Continued the monitoring program on the lower American River, documenting the use by salmon, the location of spawning redds, and the quality of treated versus untreated salmon spawning areas.
2. Placed gravel in the Stanislaus River. The criteria for gravel cleaning and sorting, specific locations and timing of placement-related activities were determined as per approved by Service and CDFG biologists.
3. Surveyed adult salmonid escapement both within and outside of the gravel placement sites in the Stanislaus River. Transects were made at all gravel placement sites both before and after gravel placement.
4. Placed gravel in the Stanislaus River. A total of 1,155 tons of spawning gravel was placed, using a hydraulic placement technique.
5. Placed gravel in the Upper Sacramento River. A total of 9,500 tons of spawning gravel was placed; 4,250 tons at the Keswick Dam site; and 4,250 tons at the Salt Creek site.

Project Title: Comprehensive Assessment and Monitoring Program
CVPIA Section 3406(b)(16)

FY 2004 Funding: \$220,179

FY 2004 Accomplishments:

The CVPIA calls for establishing a comprehensive program to assess the biological results and effectiveness of CVPIA actions undertaken pursuant to subsection 3406(b) of the statute. In the past, the Comprehensive Assessment and Monitoring Program (CAMP) funded CDFG to perform a variety of monitoring efforts, including a summer Delta tow-net survey to provide information on American shad, elements of an adult striped bass monitoring program, juvenile salmonid out-migration monitoring on the Yuba, Merced, and Tuolumne Rivers, and a Central Valley angler survey focused on catches of Chinook salmon and steelhead. The latter is a necessary component of salmonid stock monitoring, along with spawning population surveys and ocean catch estimates provided by CDFG.

Because of budget constraints, funding for the Delta tow-net survey and striped bass monitoring was discontinued in FY 2003. Funding for the juvenile studies on the Yuba, Merced, and Tuolumne Rivers had been discontinued the previous year. Lack of funding and the State budget crises combined to eliminate the Central Valley angler survey in 2004.

Activities and accomplishments in FY 2004 were as follows:

1. Closed out work on the Central Valley angler survey. The survey collected ongoing harvest data essential to determining anadromous fish production and, therefore, progress toward meeting CVPIA goals. It was funded by CAMP starting in 1998, but has been terminated as a result of budget re-prioritizations.
2. Prepared a report on adult Central Valley Chinook salmon production estimates and juvenile emigration estimates for 2001 through 2003, using information that included prior Central Valley angler surveys. Results are mixed, with apparent population increases reported on Clear, Butte, and Battle creeks, and declines reported in some areas such as the San Joaquin River tributaries. Results will be posted on-line at the AFRP web site (<http://www.delta.dfg.ca.gov/afrp/logopage.asp>).
3. Completed the second year of American River Chinook salmon and steelhead visual observation monitoring, which provided information for Folsom Dam operations and baseline data for future restoration projects.
4. Funded a report on statistical procedures for assessing progress toward the AFRP Chinook salmon production doubling goal, and in determining sustainability of production increases. The report is to be used in further development of methods to assess population changes, and will be considered in fiscal year 2005 workshops on AFRP goals.

Project Title: Glenn-Colusa Irrigation District Fish Screen Replacement Project
CVPIA Section 3406(b)(20)

FY 2004 Funding: \$1,861,289

FY 2004 Accomplishments:

The CVPIA calls for elimination of loss or damage to fish in the Sacramento River from water diversion at Glenn-Colusa Irrigation District's Hamilton City Pumping Plant. The plant diverts up to 3,000 cfs from the river, and past losses of fish at the facility have been very significant. A multi-agency/stakeholder effort to correct the problems has been under way for some time and all components of a state-of-the-art fish protection facility were completed in 2001. A five-year fish screen system testing/operation optimization program has been initiated. Transfer of the project to operations and maintenance status is scheduled for October 2007 provided the testing program finds the facility to be operating as designed.

FY 2004 accomplishments include the following:

1. Completed cost sharing agreements and transfer of funds.
2. Continued hydraulic and biological testing of completed works.

Project Title: Anadromous Fish Screen Program
CVPIA Section 3406(b)(21)

FY 2004 Funding: \$8,035,796

FY 2004 Accomplishments:

The Anadromous Fish Screen Program (AFSP) serves two functions in its efforts to protect juvenile anadromous fish from the effects of water diversions. First, it is a source of funds to diverters to install fish screens or other protective devices at their facilities. As a matter of policy, cost-share funding is only provided for features of approved projects that are required for screening and protecting fish. Up to 50 percent of the funding for qualified features can be provided. The AFSP funds are expended on a biological priority basis and the AFSP is closely coordinated with the ERP, which is a potential source of additional funds for fish screen projects.

Second, the AFSP Technical Team, with screen experts from various Federal and State resource and regulatory agencies, provides fish screen development guidance to the diverters participating in the AFSP, throughout the various phases of project planning and implementation.

The AFSP has funded fish screen projects at water diversions, ranging from 17 cfs up to 1,000 cfs, allowing diversions for authorized purposes while leaving juvenile fish in the waterway unharmed. Every project funded by the Program is a multi-year effort, with funds being provided for feasibility studies, engineering and design, construction, and then for start-up testing. Consequently, accomplishments reported in any given year may be the result of funding provided several years earlier. Through FY 2004, the AFSP has been responsible for the

construction of 21 screens. Approximately 3,200 cfs of diverted water in Central Valley streams is now fish-safe as a result. Currently, the Program is involved with seven applicants, each in various phases of project development.

Accomplishments in FY 2004 include the following:

1. Continued screen design for Natomas Mutual Water Company (NMWC) unscreened diversions in Sacramento County for a total of approximately 630 cfs on the Sacramento River.
2. Continued screen design for three Meridian Farms Water Company (MFWC) diversions that redirect water from the Sacramento River to irrigate 10,000 acres in Sutter County.
3. Completed the City of Sacramento's Sacramento River Water Treatment Plant Replacement Intake project which involved the construction of a new water intake on the Sacramento River approximately 750 feet downstream of the existing intake pier or 1950 feet downstream of the American River confluence with the Sacramento River.
4. Completed the modification of the City of Sacramento's Fairbairn Water Treatment Plant located on the American River adjacent to California State University, Sacramento. Modification included replacing existing fish screens and adding new screens to comply with the fish screen criteria established by CDFG, the Service, and NOAA Fisheries.
5. Continued design for construction of a fish screen structure for Reclamation District 2035's 400 cfs diversion on the Sacramento River, just upstream of the City of Sacramento.
6. Continued design for construction of a fish screen structure for Patterson Irrigation District's 190 cfs diversion on the San Joaquin River.
7. Continued design for construction of a fish screen structure for Sutter Mutual Water Company's Tisdale Pumping Plant on the Sacramento River in Sutter County to replace two existing pumping plants.

Project Title: **Trinity River Restoration Program**

CVPIA Section 3406(b)(23)

FY 2004 Funding: **\$8,879,207**

FY 2004 Accomplishments:

The Trinity River Basin Fish and Wildlife Management Program was established by an act of Congress in 1984 to restore the fish and wildlife stocks in the Trinity River Basin that were adversely affected by the construction and operation of the CVP's Trinity River Division. The program was fully functional until 1998 when Federal authorization and funding to develop and construct restoration measures expired.

When the CVPIA was passed in 1992, it directed Interior, in Section 3406(b)(23), to complete the Trinity River Flow Evaluation Study mandated in 1981 and, under certain conditions, to implement the flows determined necessary for fishery restoration. The CVPIA, in Section 3406 (b)(1), also directed the Secretary to address other identified CVP adverse environmental impacts, which includes the Trinity River Division. A Solicitor's opinion in 1998 concluded

that, absent reauthorization of the Trinity River Basin Fish and Wildlife Management Act of 1984, the CVPIA provided sufficient authorization in those two sections, subject to certain limitations, to implement the resulting recommendations of the Trinity River Flow Evaluation Study report.

The Trinity River Fishery Flow Evaluation Study report was completed in spring 1999 and an EIS/EIR was completed in October 2000. These documents analyzed a range of alternatives for restoring and maintaining the natural production of anadromous fish populations of the mainstem Trinity River downstream of Lewiston Dam. A final ROD was signed in December 2000. The decision called for a range of flows from 369,000 af in critically dry years to 815,000 af in wet years to be released down the Trinity River. It also called for physical channel rehabilitation to accommodate the increased flows and to restore habitat components to accommodate the anticipated increased fish returns. However, due to litigation, Interior is currently limited to restoration actions that are not flow related.

In order to implement the increased instream flows, it was determined that modifications to four existing bridges needed to be made. Because of the association with the CVPIA mandate to implement the results of the flow study, this work was determined to fall within the scope of the CVPIA. Planning and design began in FY 2001, and they were funded by CVPIA.

FY 2004 accomplishments include the following:

1. Finalized design and construction specifications for Salt Flat, Biggers Road, Bucktail and Poker Bar. Construction of replacement bridges at Salt Flat, Biggers Road, and Poker Bar, and raised approach construction at Bucktail Bridge.
2. Finalized design and initiation of construction of bank rehabilitation and floodplain restoration at Hocker Flat and other locations.
3. Rehabilitated the floodplain and channel connection with the enhancement of geomorphic and biological features. Increased geomorphic and hydraulic complexity to provide greater diversity of fish habitats capable of supporting a wide range of life history stages.
4. Revegetated native riparian habitat adjacent to constructed bridges and at rehabilitation sites. Also modified the distribution of riparian vegetation to benefit fish and wildlife species. Riparian vegetation was removed from channel margins and was restored in floodplain areas.
5. Completed flood inundation mapping to inventory and analyze all floodplain structures potentially at risk between Lewiston Dam and the North Fork Trinity River.

Project Title: Refuge Water Supply Program – Water Conveyance Component

CVPIA Section 3406(d)(1-5)

FY 2004 Funding: \$7,714,118

FY 2004 Accomplishments:

The CVPIA directs Interior to provide long-term, reliable water supplies to Central Valley State and Federal refuges, to the Grassland Resource Conservation District, and to certain lands identified in the “San Joaquin Basin Action Plan/Kesterson Mitigation Action Plan Report” (referred to as the San Joaquin Basin Action Plan lands). The Act authorized such water to be provided from CVP supplies and from water acquired by the Water Acquisition Program established pursuant to Section 3406(b)(3). The Act also authorized Interior to construct facilities as necessary to deliver the water to the various refuge units and/or to acquire the conveyance capacity from non-Federal entities for them to convey the water to the refuge areas.

The Refuge Water Supply Program consists of three separate but highly coordinated components to deliver the water supplies to the identified refuges. These are the Water Conveyance “Wheeling” Component to acquire conveyance capacity from non-Federal entities and two construction components. The Facilities Construction Component constructs needed facilities to deliver water to the State and Federal refuges, and the San Joaquin Basin Action Plan Construction Component constructs the facilities necessary to deliver water supplies to the San Joaquin Basin Action Plan lands.

The Water Conveyance “Wheeling” Component conveys prescribed quantities to refuge areas not having their own delivery facilities through cooperative agreements with wheeling entities that have conveyance capability. As of the end of FY 2004, nine long-term (25-30 year) conveyance cooperative agreements (wheeling agreements) were in place and being used to deliver water to certain refuges. These long-term agreements are with San Luis Canal Company (two agreements), Biggs-West Gridley Water District, Central California Irrigation District, Grassland Water District, San Luis Delta Mendota Water Authority, Buena Vista Water Storage District, Tehama-Colusa Canal Authority, and the Glenn-Colusa Irrigation District.

FY 2004 funds were generally expended to negotiate and implement wheeling agreements and to coordinate the overall Refuge Water Supply Program, including evaluating the various alternatives for delivery of water to the refuge areas.

FY 2004 activities and accomplishments of note include the following:

1. Worked with the Interagency Refuge Water Management Team to develop Level 2 and Level 4 water delivery schedule scenarios, expedite refuge monthly water delivery schedules, and prioritize the distribution of limited Level 4 water supplies.
2. Conveyed approximately 100 percent of Level 2 water supplies in both the Sacramento and San Joaquin Valleys. For Level 4 water, the program conveyed approximately 6,300 af in the Sacramento Valley and approximately 70,000 af in the San Joaquin Valley.
3. Coordinated with CVO, the Water Acquisition Program, and the refuges on water needs and delivery schedules to ensure the contract obligations were met. CVO was responsible

for providing Level 2 water supplies and the Water Acquisition Program component was responsible for acquiring Incremental Level 4 supplies.

4. Continued participation in the long range planning study "Evaluation of Groundwater Potential for Level 4 Refuge Water Supplies". This study was issued in July 2004, and identified groundwater data needs, refuges with the highest potential to use onsite groundwater to meet Level 4 water needs, and potential short-term and long-term implementation.
5. Initiated development of refuge water quality goals and a programmatic monitoring program.
6. Continued negotiation of a new 5-year contract with CDWR for conveying water to the Kern National Wildlife Refuge.
7. Continued development of an integrated database for refuge water supply accounting, delivery scheduling, tracking and invoicing.
8. Continued development of a report highlighting specific biological benefits documented on refuge units since the implementation of the refuge provisions in CVPIA.
9. Continued coordination with the staff from CALFED's Water Use Efficiency Program and the California State University-San Luis Obispo to install water monitoring and conservation equipment at the Kern National Wildlife Refuge on a trial basis.
10. Completed the installation of new water measurement devices for the San Luis National Wildlife Refuge through a cooperative effort with the Grassland Water District.
11. Completed the draft Criteria for Refuge Water Management Plans (Criteria). The draft Criteria were published in the Federal Register on June 28, 2004 for a 30 day public review and comment period.

Project Title: **Refuge Water Supply Program - Facilities Construction Component**
CVPIA Section 3406(d)(1-5)

FY 2004 Funding: **\$3,618,578**

FY 2004 Accomplishments:

The facilities construction component of the Refuge Water Supply Program was developed to provide the necessary infrastructure to support the long-term delivery of firm, reliable water supplies to specific State and Federal refuges in the Central Valley. These refuge units are Sacramento, Delevan, Colusa, Sutter, Kern, and Pixley National Wildlife Refuges and the State's Mendota and Gray Lodge Wildlife Areas.

To date, construction of the necessary facilities to transport water supplies to the Sacramento, Delevan, Colusa, and Kern National Wildlife Refuges has been completed. This effort includes

negotiating and awarding Facilities Construction Agreements with water purveyors to design and construct approximately 150 facilities. Also included in this effort was the fulfillment of environmental commitments pursuant to the Service's ESA BO for construction of conveyance facilities for the West Sacramento Valley Study Area (Sacramento Delevan, and Colusa National Wildlife refuges), East Sacramento Valley Study Area (Sutter National Wildlife Refuge and the Gray Lodge Wildlife Area), the South San Joaquin Valley Study Area (Kern and Pixley National Wildlife Refuges), and the Mendota Wildlife Area.

FY 2004 accomplishments include the following:

1. Continued on-going development of the environmental documentation for Mendota National Wildlife Refuge. Negotiations of the Facilities Construction Agreement for Mendota infrastructure will be initiated and finalized in FY 2005.
2. Completed designs/specifications and construction activities pursuant to the provisions in the Facilities Construction Agreement with Buena Vista Water Storage District to provide infrastructure to Kern National Wildlife Refuge.
3. Initiated the Facilities Construction Agreement with Biggs-West Gridley Water District to provide infrastructure to Gray Lodge National Wildlife Refuge. The Facilities Construction Agreement (designs/specifications and construction) is expected to be completed in FY 2008.

Project Title: **Refuge Water Supply Program - San Joaquin Basin Action Plan Component**

CVPIA Section 3406(d)(1-5)

FY 2004 Funding: **\$1,027,544**

FY 2004 Accomplishments:

Environmental documentation for implementation of the San Joaquin Basin Action Plan was completed in 1997. An Implementation Plan was completed in April 1998, and cooperative agreements with the San Luis Canal Company, Grassland Water District, and Central California Irrigation District to convey water to the Action Plan lands were completed in summer 1998. Reclamation is currently administering the cooperative agreements, which include construction and rehabilitation of facilities to accommodate the needs of the refuges within San Joaquin Basin Action Plan area. Reclamation is completing design and construction work for the remaining facilities identified in the Implementation Plan. Construction of these facilities is ongoing and is expected to continue through FY 2006 and beyond, depending on the level of future funding.

As part of these efforts, the Grassland Water District's San Luis Spillway Ditch was increased from its previous capacity of 300 cfs to 350 cfs in order to accommodate the delivery of water to wetland habitat in the Grassland Resource Conservation District and portions of the San Luis National Wildlife Refuge. The San Luis Spillway Headworks also required modification in order to accommodate the additional flows through the District's canal. The original structure included one 24-inch and three 54-inch pipes and slide gates that restricted flow to less than the

required 350 cfs. Reclamation designed a new Radial Gate Control Structure and a contract for removal and disposal of the existing structure and a contract for construction of the new structure was awarded in FY 2001. However, the contractor, Zerimar Corporation, defaulted before commencing construction, which delayed the project completion one year, FY 2003.

FY 2004 accomplishments include the following:

1. Continued progress on capacity and efficiency improvements to Central California Irrigation District (CCID) facilities. Under the existing cooperative agreement with CCID the Cottonwood Lateral was completed for the conveyance of refuge water to the Grassland Resource Conservation District from CCID's Main Canal. Funding was provided for the enlargement of the O'Banion Bypass to transfer CCID's Outside Canal water to the CCID's Main Canal, Helm Turnout, and Ora Loma Weir.
2. Continued work on the EA for the proposed delivery alternatives for the East Bear Creek Unit of the San Luis National Wildlife Refuge. This effort was contracted in 2002 with CH2MHill, Sacramento, California. Design data collection for the preparation of design and specifications for the conveyance facilities was also completed.

Project Title: Ecological/Water Systems Operations Models Development Program

CVPIA Section 3406(g)

FY 2004 Funding: \$715,690

FY 2004 Accomplishments:

The Ecological/Water Systems Operations Models Development Program is a continuing effort initiated in 1994. The program supported:

1. The Ecosystem Modeling Consensus Project, designed to identify needed development of a credible and consistent set of tools to support management decisions involving water and biological resources.
2. Review and update of the Central Valley Ground-Surface Water Model.
3. Development of a graphical user interface and database for the PROSIM and SANJASM models (note: This effort was abandoned because the CALSIM model replaced both PROSIM and SANJASM).
4. Development of the 3-D temperature model for Whiskeytown Reservoir. Development of the CALSIM II model and hydrologic input for CALSIM.

Since 1998, this program has provided a steadily increasing level of support for development and application of CALSIM II. Reclamation and CDWR have made a major commitment to CALSIM and it is essential for Interior to participate in and guide its development and application. CALSIM II is now available for public use and has been applied to water supply improvement studies. The Ecosystem/Water System Model Development Program continued

through FY 2004 to provide the basic support for continuing CALSIM II development and distribution to a wide range of users.

The Ecological/Water Systems Operations Models Development Program is also involved in the development of new reservoir and river temperature models to be used for operations and planning. Part of this effort includes ensuring that appropriate staff is capable of implementing these models. Reclamation, the Service, CDWR, and private contractors all have staff capable of applying these models that have been trained under funding from this program.

Accomplishments include the following:

1. Continued oversight and review of CALSIM.
2. Continued review and documentation of CALSIM II code.
3. Continued development of a Graphical Information System (GIS) representation of CALSIM II coverage.
4. Continued hydrology documentation for the San Joaquin Valley. Work was originally initiated in FY 2002 but was not funded until FY 2003.
5. Held a three day workshop in Sacramento on the application of the 2-D reservoir and river temperature model CE-QUAL-W2.
6. Continued management of CALSIM II and river and reservoir water temperature simulation.
7. Supported Reclamation participation in the joint, with CDWR, Climate Change Work Team.
8. Supported Service participation in review and development of CALSIM II.
9. Participated in Professional Organizations including the California Water and Environmental Modeling Forum and conferences with organizations such as American Society of Civil Engineers and American Water Resources Association.

Project Title: **Land Retirement Program**

CVPIA Section 3408(h)

FY 2004 Funding: **\$1,586,410**

FY 2004 Accomplishments:

The CVPIA authorizes Interior to acquire irrigated agricultural lands that are drainage-impaired and receive CVP water. These lands are then retired them from agricultural production. The CVPIA Land Retirement Program was established to implement this provision. The main goals of the CVPIA Land Retirement Program are:

1. to improve water conservation by district, or improve the quality of an irrigation district's agricultural wastewater,
2. to reduce drainage and improve water quality in the San Joaquin River, and
3. to use retired lands to create additional wildlife habitat in the San Joaquin Valley

In FY 2004, the CVPIA Land Retirement Program, at both its sites in Tranquillity and Atwell Island, continued acquisition, research, restoration, site management, reports, and outreach. Acquisitions for the Land Retirement Demonstration Site at Atwell Island continued to finalize transactions to reach the goal of 8,000 acres. During FY 2004, 30 acres were purchased and an additional 154 acres are expected to close by end of FY 2004. Other acquisition actions began with the acceptance of an Interior offer for a 625 acre parcel. In addition, an appraisal is currently underway for a 160 acre parcel.

The following are research accomplishments for FY 2004:

1. Completed data collection for the 5-year Habitat Restoration Study, designed to determine the effects of habitat restoration on wildlife on 20, 10-acre plots at the Tranquillity study site.
2. Entered all data into databases, proofed, edited and a suite of exploratory data analysis and graphing accomplished for selected data sets covering the 5 consecutive years of the study (1999 to 2004).
3. Conducted restoration research trials on 64 plots on 15 acres at Tranquillity and inter-planted on 20 acres of alfalfa at Atwell Island. ESRP and BLM staff assisted Reclamation to design and establish sample plots containing eight native plant species planted with a variety of techniques.
4. Continued soil and groundwater monitoring at both LR Demonstration Project sites.
5. Purchased monitoring equipment to gather weather data at Atwell Island site to be integrated into California Irrigation Management Information System (CIMIS).
6. Developed a conceptual model of groundwater flow at Tranquillity site in preparation for a numerical model simulating groundwater response to land retirement.

The following are restoration efforts & site management accomplishments for FY 2004:

1. Expanded the San Joaquin Valley native plant nursery at Tranquillity to 5 acres and increased from 34 to 64 species (13 shrubs, 30 annual herbs, 19 perennial herbs, 2 perennial grasses). Collections of 91 species from 78 locations were made on 314 collecting trips. Additionally, 8 species were established in 0.5 acre plots using mechanized production and harvesting methods. Mechanized seed cleaning equipment was purchased and operations established. Large quantities of seed were collected under seed collecting contracts. An established 1.5 acre grow-out area for native grass seed is under contract for

alkali sacaton. Continuation of research on seed delivery, plant propagation, and seed production methods with the USDA Plant Material Center in Lockeford, California. Seed augmentation of three targeted species will be conducted in FY 2005.

2. Accomplished restoration and site management activities at both Tranquillity and Atwell Island with cooperating farmers. Barley was planted at Tranquillity on 600 acres in buffers that isolate the study plots from one another, inhibit the establishment of weeds, and reduce erosion and dust. Additionally, barley was planted on 120 acres that was previously used as research trials, so that new trials can be installed in FY 2005. On 80 acres, a new cultivar of barley (UC937) developed by UC Davis for use on high saline soils was planted. Establishment of 32 miles (80 acres) of native hedgerows at Atwell Island. Seeding occurred on 20 acres of range land after treatment with a propane flamer. Iodine bush was seeded on 7 acres of a sump (former evaporation pond). A mix of native annuals and perennials was planted on an additional 20 acres. A hydro-planter installed 100 tree cuttings in riparian-canal areas along with 25 potted trees and shrubs.
3. Established a diversified upland habitat at Atwell Island as a wildlife farming demonstration area with 15 acres of native shrub plantings interspersed with 20 acres of crops, 5 acres each of vetch, milo, maze, wheat, and safflower. The results of this wildlife habitat planting laid the groundwork for a Cooperative Agreement with the Westside Resource Conservation District to implement five units in Fresno County in FY 2005. Management of the existing 20 acre wetland at Atwell Island for wintering waterfowl. Cooperation with the USDA-NRCS of Visalia led to establishment of a wetland for breeding season waterfowl and shorebirds on an adjacent 10 acres.

Reports and Recovery Implementation Plans for Upland Species in FY 2004 included the following:

1. Published the Fourth Annual Report for the Land Retirement Demonstration Project in January 2004.
2. The Five-Year Land Retirement Demonstration Project Report (1999-2004) will be available for review by October 2004. For the Tranquillity site of the CVPIA Land Retirement Program Demonstration Project, this report will fulfill the five years of monitoring requirements pursuant to the Service's ESA BO September 1999.
3. Developed an Implementation Plan for recovery of upland species on restored retired agricultural lands began in FY 2004. Updates by subject experts of listed species' habitat requirements form the basis for discussions of how to best utilize the techniques and native plant species of the CVPIA Land Retirement Program for upland habitat restoration on retired agricultural lands. Such restoration could contribute, possibly substantially, to upland species recovery. Information will be collected in FY 2004 and the Implementation Plan written and reviewed in FY 2005.

Outreach accomplishments for FY 2004 included the following:

1. Presentations and posters were given at a number of forums in FY 2004. These included: Annual Statewide CDWR Workshop, Drainage and Salinity Annual Conference, American Society of Mammalogists, California Native Plant Society, Society of Ecological Restoration and the Raptor Research Foundation.
2. Outreach to the local high school science classes and science clubs introduced a workshop on land retirement that included classroom and on-site field work. A volunteer day at the native plant nursery was held in observance of Earth Day. Two CSU Fresno graduate students are conducting research at the Tranquillity site. They are investigating the population structure of native plant pollinators and seed delivery methods for 7 native plant species. A graduate student from CSU Fresno is studying the effects of post-harvest flooding at Atwell Island.
3. Partnerships were fostered by participation in the Tulare Lake Basin Working Group. Partnerships have been developed with Sequoia Riverlands Trust; Tulare County Audubon Society; USDA-NRCS; and the Service.

DISCUSSION OF CVPIA IMPLEMENTATION AND RESULTS

Fiscal year 2004 was the 12th year since passage of the CVPIA. Over this period, hundreds of actions have been taken to meet the Act's goals and objectives. Many of these actions were procedural and, once implemented, fulfilled the statute's requirements. For other provisions, particularly the fish and wildlife measures, progress towards attaining CVPIA goals and objectives has been more gradual. Measuring progress towards attaining these goals and objectives has been a challenging task. The long-term, system-wide results of implementing individual actions, or of multiple actions within any single year, may not be seen for many years and when apparent, may not be directly attributable to any particular action but rather to a suite of actions taken by multiple programs over a long period of time. Consequently, reporting the response of the ecosystem to actions implemented in any particular year and then separating that response from results of work done in previous years is not practical. This is as true for FY 2004 as it has been for any of the previous 12 years of CVPIA implementation.

Nevertheless, we believe target fish and wildlife resources are responding to CVPIA measures. The long-term programs and plans developed to achieve goals and objectives of the CVPIA are gradually being realized. The numbers of salmon returning to the Central Valley are increasing. Salmon have returned to spawn in areas where they have not been seen for many years. Hundreds of thousands of ducks, geese and other migratory birds are using wetlands areas newly created or greatly enhanced as a result of CVPIA programs. Avian diseases throughout the valley have declined. Tens of thousands of acres of habitat has been acquired for threatened and endangered species and thousands more has been restored and/or enhanced, clearly benefiting species on the brink of extinction, increasing their chances for recovery.

To better identify progress towards meeting CVPIA goals, the Restoration Fund Roundtable tasked a subcommittee to engage with Reclamation and the Service in an effort to evaluate

CVPIA programs. The resulting “Program Evaluation” process includes identifying objectives of CVPIA programs, clarifying measurable outcomes, and evaluating progress. Thus far, Reclamation and the Service have focused on four programs as a pilot to test this process: the Clear Creek Restoration Program, the Spawning Gravel Replenishment Program, the AFRP, and the AFSP. For the Clear Creek Restoration and Spawning Gravel Replenishment programs, draft documents have been produced that detail objectives, outcomes, and progress. The Restoration Fund Roundtable has provided feedback, and the documents are continually improving. Current planning is underway for the AFRP and the CALFED Science Program to hold a joint workshop during the summer of 2005 to address anadromous fish restoration issues. Finally, to identify the extent that screening diversions is necessary in the Central Valley, the AFSP has convened a Fish Screen Program Evaluation Committee. This committee meets monthly, and is comprised of representatives from the Service, Reclamation, CDWR, CDFG, NOAA Fisheries, ERP, and the ERP Science Board. Through the use of models and monitoring of juvenile anadromous fish loss in diversions, this committee hopes to gain an understanding of the impact that diversions have on anadromous fish populations, and using that information, develop screening criteria to minimize that impact.

Anadromous Fish - Biological Response

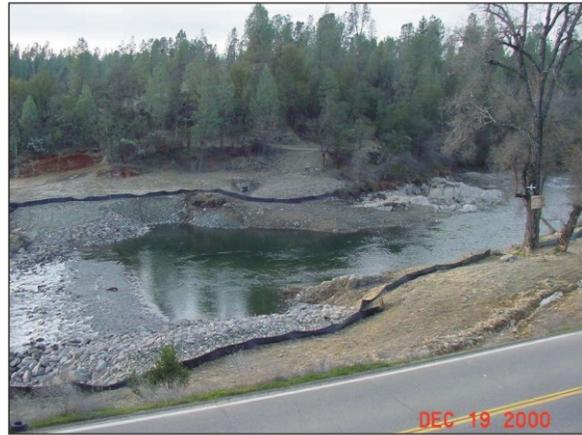
Chinook salmon continue to be a high priority for CVPIA restoration efforts. A majority of implemented measures and the \$459 million expended to benefit anadromous fish over the past 12 years has been focused on this species. While the numbers of salmon along the West Coast have declined, adult returns to the Central Valley and the catch off the California coast have increased overall, correlating well with implementation of CVPIA measures since 1993. Even though other factors such as hydrology, ocean conditions, and fishing regulations have undoubtedly had some effect, the other declining west coast salmon fisheries have been subject to these same factors as well.

Clear Creek provides a good example of positive biological gains correlating closely with CVPIA-related efforts. On Clear Creek, streamflows were increased during critical periods for fall-run Chinook salmon; spawning gravel was added to the stream; degraded portions of the stream channel, floodplain, and adjacent riparian habitats were restored; and erosion and sedimentation from sources within the watershed were controlled. McCormick-Saeltzer Dam, a major impediment to upstream passage of salmon and steelhead, and an associated unscreened diversion that reduced flows in the lower portions of the creek, have been removed.

Clear Creek Removal of McCormick - Saeltzer Dam



Before



After

The fall-run Chinook salmon runs in Clear Creek increased greatly following implementation of these measures. Spawning production of fall-run Chinook salmon in Clear Creek, which in 1952-1991 averaged 4,625 fish, increased to an average of 11,515 fish in 1992-2003. Furthermore, the improvement in flows and removal of McCormick-Saeltzer Dam opened Clear Creek to use by steelhead and spring-run Chinook salmon, both threatened species. Adult returns over the next several years should indicate whether there will be significant increases in numbers of these special status species and indicate whether or not the fall-run response is a long-term upward trend induced by CVPIA actions or just a temporary or cyclical increase resulting from other factors. At this time, the results are very encouraging.

Very positive biological gains have occurred on several other streams where CVPIA efforts have been focused. Notable among these is Butte Creek, where spring-run Chinook returns have been steadily improving. Butte Creek spring-run natural production, which averaged only 2,231 fish from 1960-1991, increased to an average of 14,350 fish since 1995 (1995-2003) when Butte Creek restoration measures were implemented.

Natural production of salmon on several Central Valley streams, in some years, has reached or exceeded levels twice the average between 1967 and 1991¹. To determine if this increased natural production is sustainable on a long-term basis, several life cycles (three to five years per cycle) of continued monitoring would be necessary under a variety of environmental conditions. In addition, there are many other streams where the production of salmon and other anadromous fish are still declining.

¹ The CVPIA goal for AFRP is to ensure that the natural production of anadromous fish in Central Valley rivers and streams be sustainable, on a long-term basis, at levels at least double the average that existed during the 1967-1991 baseline period. A statistical process is being developed to assist in determining the sustainability of increased population levels.

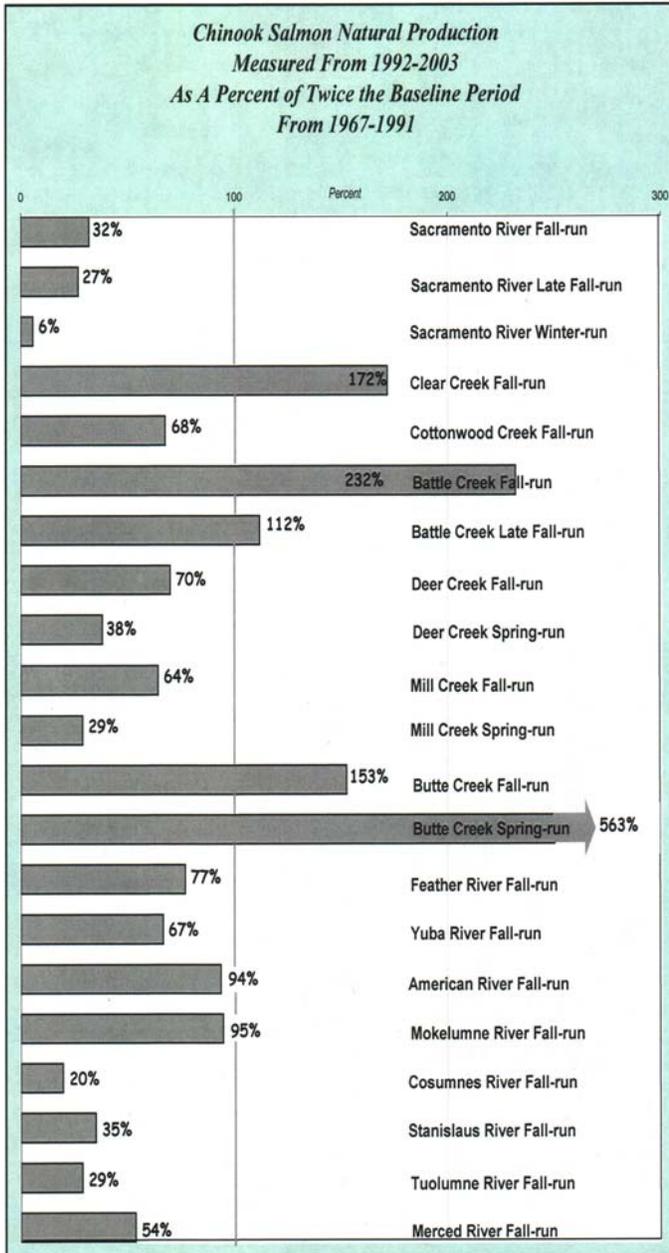


Figure 5

In those Central Valley rivers and streams with sufficient data, Figure 5 presents natural production of Chinook salmon for the period of CVPIA implementation (1992-2003) as a percentage of twice the average production during the baseline period (1967-1991). For example, Figure 5 shows natural production of Clear Creek fall-run Chinook salmon to be 172% greater than twice the baseline production. If Clear Creek fall-run Chinook salmon numbers are shown to be sustainable, then the sustainable doubling goal could have been exceeded by 72% for this run on Clear Creek. Likewise, production for Yuba River fall-run is 67% of twice the baseline production, or 33% below this level and 17% above the 1967-1991 average production. In contrast, production for Tuolumne River fall-run is 29%, or 71% below twice the baseline production and 21% below the 1967-1991 average production. Natural production was calculated based on escapement data compiled by the California Department of Fish and Game in their *GrandTab* database² and using methods described in Appendix A of the Final Restoration Plan for the Anadromous Fish Restoration Program (USFWS, 2001)³. Several small streams and two rivers identified in the Final Restoration Plan are not included in this figure due to insufficient data⁴. Five of the 21 populations of Chinook salmon in Figure 5 have exceeded the numeric doubling goal and 13 (including these 5) have exceeded production for the baseline period. As stated earlier, continued monitoring will be necessary to determine if these production levels are sustainable on a long-term basis.

² Because numbers associated with this process include estimates, there are inherent sample errors.

³ U.S. Fish and Wildlife Service, 1995. Working paper on restoration needs: Habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volumes 1-3. May 9, 1995. Prepared for the U.S. Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program Core Group. Stockton, CA.

⁴ Cow Creek, Paynes Creek, Antelope Creek, Miscellaneous small creeks, Big Chico Creek, Bear River and the Calaveras River were not included.

Refuges and Waterfowl - Biological Response

With the passage of CVPIA, a firm and reliable water supply was made available to Central Valley State and Federal refuges, and private wetland areas. Flooding waste grain agricultural fields during the winter provided new seasonal habitats for waterfowl. Waterfowl, shorebirds, and other wetland-dependent wildlife benefited from the expansion and enhancement of habitat. Valley refuges reported increases of thousands of acres of new wetland habitats and tens of thousands of acres of enhanced habitats as a result of CVPIA water supplies. These refuges provided habitat for longer periods during the year, providing refuge managers with the ability to manage a much more diverse mix of habitat types that more fully satisfied the year-round environmental requirements of many wildlife species. Prior to CVPIA, refuge managers had to concentrate the vast majority of their water use in the fall and early winter months, when Central Valley waterfowl numbers peaked. With the passage of CVPIA, the habitat calendar was expanded to the full year. Under CVPIA, moist soil food plant irrigations are carried out; water is available during August and September to satisfy the needs of the first wintering ducks and geese that arrived in the Central Valley; maintenance flows are applied throughout the winter months to improve water quality and decrease avian disease outbreaks; and spring and summer water provided critical nesting habitat for waterfowl and colonial birds.

Water availability also enhances refuge managers' ability to provide a food supply for the winter migrants. Waterfowl food production increased tenfold in some refuge areas. The Grasslands Resource Conservation District (RCD) increased its acreage of enhanced seed production from 4,000 acres in 1991-92 to an average of 26,000 acres from 1993 to 2004. In that same time period, plant biomass doubled per acre.

Waterfowl use increased nearly as much. In the Grasslands RCD, waterfowl use in the early fall increased by 300 percent. Other areas recorded increases of 800 percent, from 2 million to over 18 million waterfowl use days per year. Not only has waterfowl use increased, but visits to these areas by the public have increased as well, drawn by the prospect of seeing hundreds of thousands of birds of many species at one time in a far more natural setting than was previously possible.

Additional refuge water supplies provided by CVPIA have helped to alleviate waterfowl overcrowding, particularly in the Sacramento Valley. Waterfowl disease-related mortality, usually caused by overcrowding and stagnant water, decreased markedly in the valley as birds took advantage of the increased habitat and improved water quality. Cholera outbreaks, once frequent and widespread in the Sacramento Valley, have been reduced to one major incident since the passage of CVPIA. Similarly, the Sacramento NWR complex reported a nearly 89 percent decline in botulism since 1992, compared to the decade prior to the availability of CVPIA water supplies.

Species other than waterfowl benefited from CVPIA water. Sacramento Valley refuges reported an increased presence of western pond turtles and colonial nesting birds, such as the tri-colored blackbird. In fact, the largest tri-colored blackbird colony documented in California in 2004 occurred at Delevan NWR, a population of over 75,000 individuals. In addition, refuges in the San Joaquin Valley noted increases in populations of giant garter snake and in nesting western,

Clark's, and eared grebes; black-crowned night herons; and tri-colored blackbirds. Valley-wide, shorebird use on shallow wetlands increased by hundreds of thousands as sandpipers, dunlins, yellowlegs, phalarope, and dowitchers responded to the increased wetland acreage and subsequent invertebrate food supplies. More than 150 species of other birds, 20 species of butterflies, 15 species of dragonflies, 5 species of reptiles, 2 species of amphibians, and 10 species of mammals were reported using these enhanced habitat areas in the North Grasslands Wildlife Area alone.

White-faced ibis and sandhill cranes are excellent examples of how the availability of adequate water supplies enabled refuge managers to provide habitat for endemic species that had been in severe decline for decades. Improved water supplies first led to an increase in the numbers of frogs, snails, aquatic insects, and small fish. This, in turn, provided the ibis and cranes with habitat for late-spring and summer nesting, essential components for these species. The increased and improved breeding habitat resulted in a steady upswing in bird numbers. Sutter NWR, for example, hosted 100 white-faced ibis in 1991. That number increased to 1,000 birds in 2000, 7,000 in 2001, and a staggering 15,000. Kern NWR had a similar experience, with 50 ibis in 1991, 5,600 in 2001, and over 8,000 in 2004. Pixley NWR supported 200 sandhill cranes in 1992 when the CVPIA was passed. It received its first allocation of CVPIA water in 1993 and provided habitat for more than 2,000 cranes that year. By 2001, the number rose to 5,100 sandhill cranes and has remained over 5,000 ever since.

Other Fish and Wildlife - Accomplishments

Efforts under the CVPIA since 1993 to protect and provide habitat for fish and wildlife species other than anadromous fish and wetland-dependent wildlife have resulted in the acquisition of more than 98,179 acres from willing sellers at fair market prices, and the restoration of 1,111 acres of native habitat for special status species. This includes fee acquisitions as well as conservation easements and was usually accomplished through partnerships with others such as TNC and TPL. These lands are now protected from the adverse impacts that would have occurred if they were developed. Nearly 8,300 acres of drainage impaired agricultural lands have been retired from irrigated agriculture, 2,411 acres of which has been treated to begin the process of restoration of upland habitat characteristics. Desirable plant and animal habitats along the San Joaquin River from Friant Dam to the river's confluence with the Merced River are being enhanced. Over the next several years, we anticipate that the populations of species associated with these habitats, and particularly those that are considered threatened or endangered, will increase substantially.

The CVPIA Land Retirement Program Demonstration Project experience is perhaps indicative of the benefits that we expect to achieve. Preliminary monitoring results from the Westlands site indicate a decline in the shallow groundwater table in response to land retirement, which is important as the highly saline groundwater has high concentrations of selenium and boron. Restoration of these retired lands and their use by wildlife however, has not resulted in increased levels of bio-accumulated selenium. Selenium concentrations in vegetation, invertebrates and mammals have not changed significantly over the study period to date. All selenium levels measured are considered below concentrations of concern to EPA and the Service.

Treating these lands has increased abundance and diversity of wildlife. Increased invertebrate species and abundance include parasites and predators of agricultural pests as well as beneficial pollinators. Bird species diversity and abundance increased across all treatments immediately following restoration efforts. Recorded at the Demonstration Project site in Fresno were 17 special status avian species. Populations of small mammals increased substantially on retired lands. Three special status mammalian species colonized restored land at Atwell Island, including the San Joaquin kit fox, observed using the 80 acres of hedgerows established this fiscal year. Native seed supplies necessary for successful restoration are being secured in four ways: (1) a native plant nursery is propagating 91 species collected from 78 sites; (2) an organic farmer is growing two perennial grasses; (3) natives from remnant populations are being gleaned through seed collection contracts; and (4) seed augmentation and propagation are being done through an MOU with the USDA Plant Material Center in Lockeford, CA.

CONCLUSIONS

Quantifiable Progress In 2004

At the conclusion of 2004, significant progress has been made in meeting CVPIA's fish and wildlife goals. This progress includes, on some watersheds, nearing the dominant target of seeking to double anadromous fish numbers in the Central Valley system and in restoring and invigorating other species at risk. In the first decade since the CVPIA was enacted, a vast amount of essential "foundation work" has taken place. Foundation work is essential to the final outcome, but often not highly visible. It involves many activities -- data collection, research, development of alternatives, alternatives analysis and feasibility studies, permitting and design work. Adequate foundation work is critical if the desired outcomes (CVPIA's purposes) are to be achieved: (a) fish and wildlife protection, restoration and enhancement; (b) addressing CVP impacts; (c) improving CVP operational flexibility; (d) expanding water transfers; (e) protecting the Bay/Delta; and (f) achieving a reasonable balance of CVP water uses. Much of that work has been accomplished, although more must continue.

In 2004, some significant "on the ground" achievements were made toward the overall environmental goals of the CVPIA. The achievements, and the promise for similar achievements in the future, create a level of optimism that the CVPIA can achieve its environmental goals within a reasonable period of time and with reasonable expenditures.

One of the most significant events through 2004 has been the increase of anadromous fish populations in five different Central Valley tributary streams (Figure 5, page 48). Most notable is the Butte Creek spring-run Chinook salmon, whose population has increased to an astonishing 563 percent of twice its average 1967-1991 natural production, the numeric target of the AFRP for Butte Creek established under CVPIA. Such increases need to be sustainable⁵ to meet CVPIA's mandate, and the outlook for meeting that mandate is very promising. In Battle Creek, a watershed where restoration efforts have been shared by both CALFED and CVPIA, the fall-run Chinook salmon natural production has increased to 232 percent of twice its average 1967-1991 production. In Clear Creek, the Chinook salmon natural production has

⁵ Sustainable doubling of natural production is the CVPIA goal for the AFRP effort and a statistical process is being developed to assist in that determination.

increased to 172 percent of twice its average 1967-1991 production. Three other Chinook salmon populations appear very close to their numeric targets--American River fall-run, Mokelumne River fall-run, and Battle Creek late fall-run.

Actions taken under the CVPIA and other restoration programs such as CALFED are believed to have greatly influenced the significant resurgence in anadromous fish populations in widely dispersed areas of the Central Valley. They involve several different types of activities, including the removal of smaller old dams and barriers reopening many miles of spawning habitat, carefully planned deposition of gravel recreating lost spawning habitat, improvement of stream-side habitat, better management of available instream water supplies, addition of fish screens at many intakes protecting both seaward-migrating smolt and adults returning to spawn, support for larger habitat restoration efforts in the watershed, and surveys and research work to help fishery biologists better understand workings of the Central Valley fishery and ways to re-invigorate its fish populations.

Spawning gravel replenishment has developed as an essential and highly effective tool to improve anadromous fish populations on many streams. Nearly 11,000 tons of gravel was placed in the Upper Sacramento and the Stanislaus rivers in 2004. Salmon use the new gravel beds to spawn, helping increase fish numbers in those streams. In some streams, deeper pools that shelter salmon predator fish have been re-configured to eliminate the threat to anadromous fry.

To be sure, there is much more work to be accomplished. Challenges are particularly complex on rivers where the largest, most important dams prevent migration to historic headwater habitats. Even so, some improvements appear significant, including near-achievement of the numeric AFRP target for fall-run Chinook salmon on the American and Mokelumne rivers, 77 percent of the numeric target for fall-run on the Feather River, and 67 percent for fall-run on the Yuba River. The program continues to make progress on other smaller streams.

Important achievements were also made as a result of the refuge water supply program, keystone in efforts to reinvigorate and expand other imperiled bird, fish and animal populations in the Central Valley. In 2004, the CVPIA acquired and/or conveyed nearly 71,000 acre feet of Level 4 water, historically needed but not widely available for refuges in the past, and provided 100 percent of the more reliable Level 2 refuge water supplies. The increased water availability expanded refuge wetland habitat by thousands of acres and kept water available to birds for longer periods. Bird numbers continue to reflect the improved conditions.

Overall, nearly 65,000 acre feet of Level 4 refuge water supplies was acquired in 2004 from willing sellers, at a cost of about \$100 per acre-foot. The direct result of these acquisitions continues to be a much larger, healthier bird population. Kern National Wildlife Refuge (NWR), for example, had 50 white-faced ibis the year before CVPIA and counted 8,000 in 2004. Sutter NWR counted 100 ibis in 1991 and a staggering 15,000 in 2004. Another bird species showing renewed vigor is the tri-colored blackbird, a species not yet listed but which has been identified by some environmental interests as needing protection. It had an identified population of 75,000 birds at Delevan NWR in 2004.

Other types of habitat restoration also achieved significant progress in 2004. The Habitat Conservation Program participated in the acquisition and/or restoration of nearly 7,000 acres of important Central Valley habitat. Restoration included areas along the Sacramento River in Tehama County, at Drumheller Slough in Glenn County and at several sites in Santa Clara County. Additionally, habitat was acquired along a San Joaquin River tributary in Madera County and in the Carizzo Plain in Kern County.

To Continue Progress in the Future

Although some of the modifications made to Central Valley water system structures and its habitats will provide long-term benefit for species, continued progress will require a solid level of support in the coming years. Limited and fluctuating budgets may make it difficult to meet the immediate needs or to sustain efforts without large infusions of funds from other sources. The Anadromous Fish Screen Program, for example, has a current backlog of active projects requiring approximately \$40 million in additional program funds to complete, yet the FY 2005 budget provides only 20 percent of that amount (\$8.2 million). Similarly, the Water Acquisition Program struggles to provide sufficient additional water to meet fish and wildlife needs. At current prices, provision of full Level 4 refuge water supplies (159,000 af) will require more than \$19 million annually to achieve, yet the FY 2005 budget provides less than half that amount. The 12-year commitment to the San Joaquin River Agreement (SJRA), which provides pulse flows to the lower San Joaquin River and anadromous fish attraction flows in certain San Joaquin River tributaries, costs roughly \$6.9 to \$9.7 million annually (depending on the hydrologic year type), accounting for as much as 67 percent of the total FY 2005 Water Acquisition Program budget of \$12.6 million. As a result, very little funding will be available to acquire water for instream flows on other Central Valley streams during the life of the current SJRA agreement, scheduled to expire after FY 2011. Other essential CVPIA programs, most notably the AFRP, continues to be under-funded resulting overall in a program whose implementation is much slower than expected.

Interior is proud of its efforts to date, but recognizes the job is far from being complete. The Department believes implementation of the CVPIA is on the right course, a course that will continue to provide increasingly significant benefits if support remains steady.