


CVPIA

ANNUAL REPORT FOR FISCAL YEAR 2003

Implementation of the Central Valley Project Improvement Act

Annual Report for Fiscal Year 2003

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

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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 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 the Department of the Interior (Interior).

It has been 11 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 $692 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) 2003. 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 this system. 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 fishes 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.

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

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 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 double the natural production of six species of anadromous fish, species believed to have been affected by CVP construction and operation. Another 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. Measures proposed for implementation under the CVPIA are all to be prioritized. Any measures 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 amount of the 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:

- the species or populations of greatest concern;
- the controllable factors that have the greatest influence on these species or populations; and
- the geographic areas or habitats in most critical need of help for the priority species and/or for the greatest number of species.

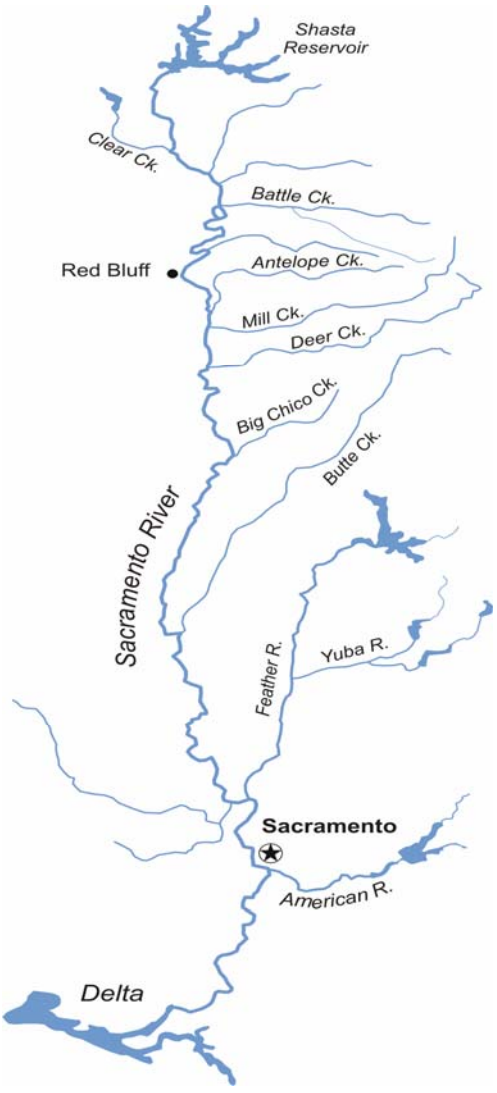
Other biological considerations and principles applied in our implementation of the CVPIA include the emphasis in the Act itself on restoration of natural habitat components and ecosystem function and viability. Another is the emphasis on "focused packages" (suites of actions similar in nature in a specific 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 in their natal streams, and must over-summer there. 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.

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

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 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. These increased supplies of water 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 this data is being gathered and analyzed, the focus for 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 Agricultural Land Retirement Program is acquiring land which, when retired from irrigated agriculture and restored or allowed to revert to natural conditions, will serve 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 California Bay-Delta Authority's (Authority) Ecosystem Restoration Program. 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 Ecosystem Restoration Program 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 Ecosystem Restoration Program 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 Ecosystem Restoration Program 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.

Funding Sources

Implementation of the prescribed actions and programs of the CVPIA through the first 11 years (1993 – 2003) has cost approximately $692 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 - $36 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 $692 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 2003, more than $62.9 million was allocated by Interior for the various CVPIA programs and actions. Nearly 80 percent of this allocation was provided from the CVPIA Restoration Fund.

Figures 1 and 2 on page 10 show the expenditures by fund source, **Figure 1** for the 11-year period since FY 1993 and **Figure 2** for FY 2003 alone.

The largest portion of the monies spent since 1993 have been spent on structural measures, such as the Shasta Temperature Control Device and the Glenn-Colusa Irrigation District Fish Screen Project, projects that benefit water and power users as well as anadromous fish. Large amounts were also spent 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 11, **Figures 3 and 4**, respectively, show the total distribution of these expenditures among action categories for the entire FY 1993-2003 period and for FY 2003 alone.

FIGURE 1
CVPIA EXPENDITURES BY FUND SOURCE
Fiscal Years 1993-2003

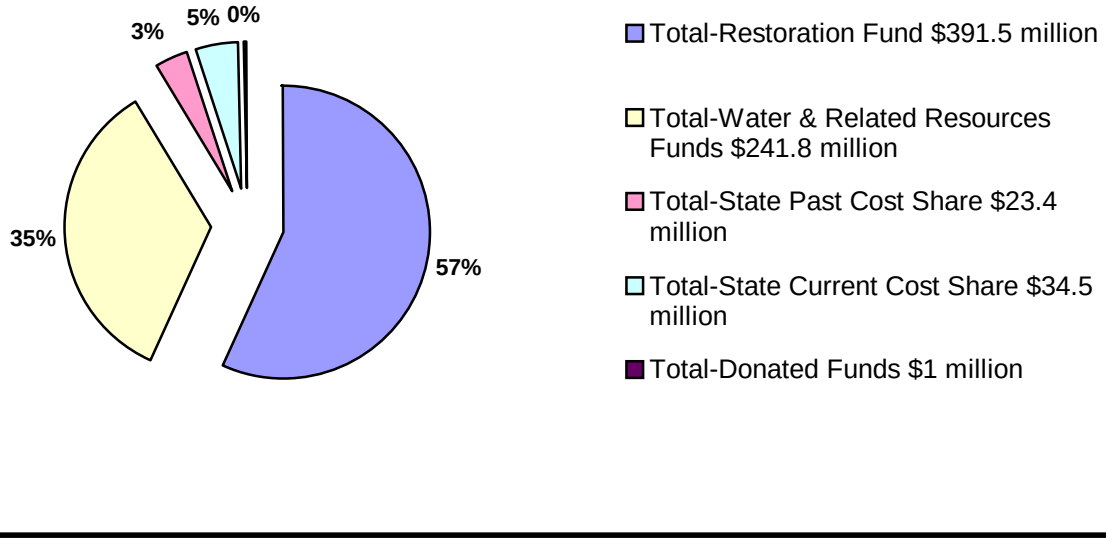


FIGURE 2
CVPIA EXPENDITURES BY FUND SOURCE
Fiscal Year 2003

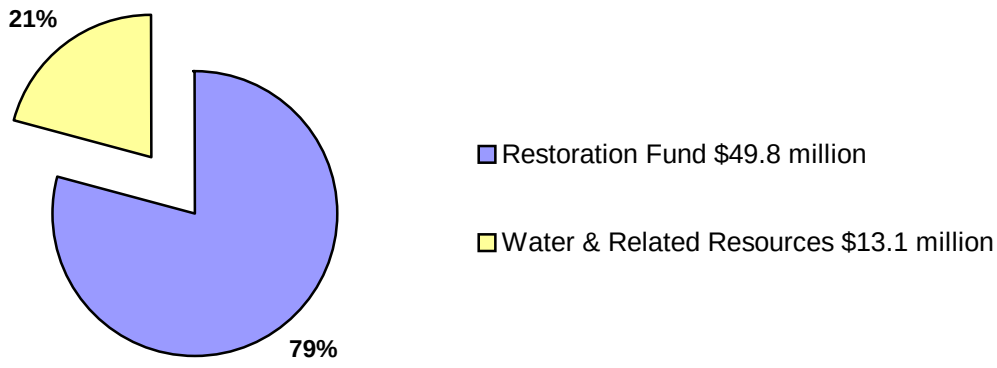
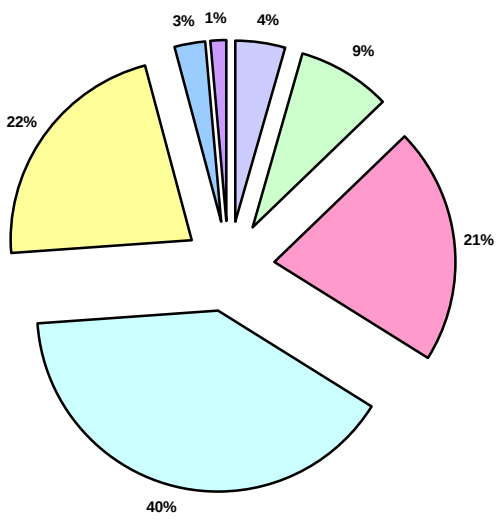
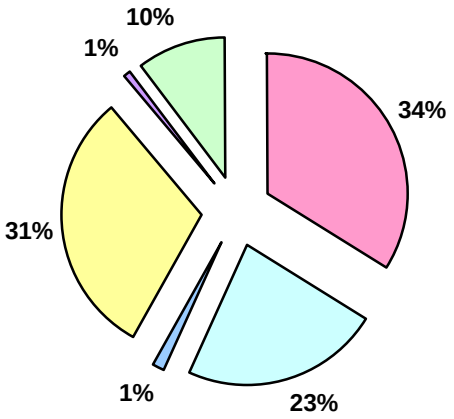


FIGURE 3
TOTAL CVPIA EXPENDITURES BY ACTION CATEGORY
Fiscal Years 1993-2003



- Admin./Contracts/Improved Water Mgmt. $30.0 million
- Other Fish and Wildlife $58.9 million
- Anad. Fish - Habitat Restoration $145.9 million
- Anad. Fish - Structures $277.1 million
- Refuges & Waterfowl $150.9 million
- Studies/Investigations/Modeling $20.4 million
- Monitoring $9.0 million

FIGURE 4
CVPIA EXPENDITURES BY ACTION CATEGORY
Fiscal Year 2003



- Anad. Fish - Habitat Restoration $21.3 million
- Anad. Fish - Structures $14.4 million
- Studies/Investigations/Modeling $0.85 million
- Refuges & Waterfowl $19.4 million million
- Monitoring $0.50 million
- Other Fish and Wildlife $6.5 million

FISCAL YEAR 2003 ACCOMPLISHMENTS

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 2003.

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

FY 2003 Funding: **$5,000,000**

FY 2003 Accomplishments:

The CVPIA directs us to implement a program that makes all reasonable efforts to at least double the natural production of six species of anadromous fish in Central Valley rivers and streams over levels that existed in the 1967-1991 period. Anadromous fish are those species that are born in freshwater but migrate to saline waters such as the ocean 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 the goal of doubling the natural production of these species of anadromous fish are guided by the Final Restoration Plan (Plan) for the AFRP (USFWS, January 2001) developed by AFRP staff in coordination with experts from many agencies and stakeholder groups. After extensive input and public review, this Restoration Plan was finalized in 2001. The general objectives needed to achieve the doubling goal were identified as the following:

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 identifies 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 are 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 carried out independently and reported separately.

Hundreds of actions have been implemented since passage of CVPIA to help achieve the CVPIA goal for anadromous fish. All have been 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 are also coordinated with other agencies and other programs to avoid duplication and to make the most effective use of limited CVPIA funds. Of particular note is the coordination with the Authority's Ecosystem Restoration Program. The Authority's Ecosystem Restoration Program has many of the same objectives as the AFRP. To enhance this coordination, proposed AFRP actions in recent years have been submitted to Authority's Ecosystem Restoration Program review panels for their opinion on the priority and relative merit of the action proposed. Frequently, CVPIA and the Authority's Ecosystem Restoration Program will partner in the implementation of measures. Other actions may be funded entirely by the Authority's Ecosystem Restoration Program or CVPIA, regardless of which entity actually developed or solicited the proposal.

Listed below by geographic area from north to south are restoration projects developed and funded by the AFRP in FY 2003, including the AFRP objectives they address.

Mainstem Sacramento River Watershed

- Environmental Compliance and Hydrologic Evaluation of the La Barranca Project. An analysis was initiated to provide several hydrologic engineering options for floodplain restoration on the La Barranca Unit of the Sacramento National Wildlife Refuge, where a dysfunctional levee, gravel mining pits, and non-native vegetation are of concern. This effort also includes initiating the preparation of requisite environmental compliance documents to assist selection of the most appropriate restoration alternative. (Objectives 1 and 6)

Cow Creek Watershed

- Development of a Watershed Management Plan for Cow Creek. A watershed management planning effort was initiated on Cow Creek that will identify the specific restoration actions necessary to achieve watershed goals essential to improve anadromous fish production. It will also include development of an adaptive management process to guide implementation of identified restoration actions. (Objectives 1, 2, 3 and 6)

Yuba River Watershed

- SHIRA-based Experiments on the Lower Yuba River. Efforts were initiated to use habitat scale 2-dimensional modeling analyses and field based manipulative sediment transport experiments to balance habitat and geomorphic goals on the lower Yuba River. (Objectives 1 and 4)

Mokelumne River Watershed

- Mokelumne River Spawning Habitat Improvement Project. Funding was provided to the East Bay Municipal Utility District to purchase gravel and boulders to continue their long-term spawning improvements in the lower Mokelumne River. This project is being closely coordinated with the FY 2002 U.C.-Davis demonstration project to test a new interdisciplinary approach to rehabilitating salmon spawning habitat in the Central Valley. (Objectives 1 and 6)

Cosumnes River Watershed

- Flow Requirements for Salmon Passage in the Cosumnes River, Sacramento County, California. Efforts were initiated with the Fishery Foundation of California and The Nature Conservancy (TNC), in cooperation with local water districts and watershed groups, to conduct a study of the streamflow and water supply needs for salmon passage in the Cosumnes River. Emphasis will be on adult salmon passage in the fall. (Objectives 1, 4 and 6)

Calaveras River Watershed

- Design, Construct, and Evaluate Fish Passage Facilities at the Bellota Weir on the Lower Calaveras River. Efforts were initiated with the Fishery Foundation of California, in cooperation with the Stockton East Water District and the California Department of Water Resources (DWR), to improve temporary fish passage facilities on the Calaveras River at Bellota Weir and perform preliminary engineering design for future permanent fish passage facilities at either Bellota Weir or the Calaveras Headworks. (Objectives 3 and 6)

Tuolumne River Watershed

- Up-migration and Straying of Tuolumne River Salmonids in Response to Fall Attraction Flows and Environmental Factors. Funds were provided to Stillwater Sciences to initiate a study to assess the relative benefits of fall pulse flows for attraction of salmonids on the Tuolumne River. This proposal was revised and reviewed by AFRP staff and, in addition, reviewed by the Ecosystem Restoration Program project review panel. Data collection and analysis started in October of 2003. (Objective 1 and 3)

Merced River Watershed

- Evaluate the Success of Spawning Habitat Enhancement on the Merced River, Robinson Reach. Funds were provided to DWR to initiate a study to assess and document the habitat benefits associated with the Chinook salmon spawning habitat restoration work implemented in previous years, primarily on the Robinson reach of the Merced River. This proposal was revised and reviewed by AFRP staff and, in addition, reviewed by the Ecosystem Restoration Program project review panel. Data collection stared in October of 2003. (Objective 4)

The following three conservation projects, submitted to the Ecosystem Restoration Program as part of their Proposal Solicitation Process and approved by their review panels for priority implementation, were also funded and managed by the AFRP.

Butte Creek Watershed

- White Mallard Dam and Diversion. AFRP funds were provided to Ducks Unlimited, Inc., a non-profit resource conservation organization, to initiate the replacement of the White Mallard Dam on Butte Creek and to construct a new fish ladder at the dam. This project will greatly improve fish passage at the dam and diversion for fall, late fall, and spring-run Chinook salmon and steelhead and will provide for better flow control and monitoring of fish runs. (Objectives 3 and 6)

American River Watershed

- Lower American River Temperature Reduction Modeling Project. Initiated a project to develop predictive temperature models that will guide efforts to make the most efficient and best use of the limited amounts of cold-water resources that Folsom Dam and Reservoir provides. (Objectives 1, 4 and 6)

Central Valley-wide

- Distribution and Relationship of Resident and Anadromous Central Valley Steelhead Rainbow Trout. Funds were provided to the California Department of Fish and Game (DFG) to initiate a study that will evaluate the composition of resident and anadromous steelhead/rainbow trout by analyzing the calcium and strontium ratios in otoliths. (Objective 4)

In addition to those restoration actions funded in FY 2003, the following accomplishments resulted from projects funded and/or implemented by AFRP in earlier fiscal years but not actually completed or achieved until FY 2003.

Battle Creek Watershed

- Completed two of three components to evaluate operation alternatives for integrating Coleman National Fish Hatchery management with ongoing salmon and steelhead restoration activities. (Objectives 1 and 6)
- Conducted a watershed ecology and management education course for school-aged children and adults. (Objective 6)

Cottonwood Creek

- Funded development of up-to-date aerial photography of the Cottonwood Creek watershed, a necessary pre-requisite to planning and implementing projects for watershed and stream restoration actions. (Objective 4)

Bear Creek

- Assisted a Bear Creek watershed group in a citizen-run salmon spawning redd and carcass survey and a water quality monitoring effort. (Objectives 4 and 6)

Mill Creek

- Initiated a fish passage study using hydroacoustic technology in cooperation with the DFG, the National Atmospheric and Oceanographic Administration, the Mill Creek Conservancy, the Los Molinos Mutual Water District, landowners, and other interested stakeholders. Field data collections for this study are to be initialed in Spring of FY 2004. (Objectives 3, 4 and 6)

Lower Butte Creek

- Through funding of Ducks Unlimited as the project manager, the Existing Conditions Report (Phase I) on the Lower Butte Creek Project was completed. This project will restore lower Butte Creek, focusing on five reaches: (1) Butte Sink, including all lands south of the Colusa-Gridley Highway and east of Butte Creek; (2) White Mallard and Associated Diversions, including all lands south of the Colusa-Gridley Highway and west of Butte Creek; (3) Butte Slough, from the Sacramento River to the Sutter Bypass; (4) Sutter Bypass-West Side; and (5) Sutter Bypass-East Side. (Objectives 1 and 6)
- Completed the Engineering and Permitting phase (Phase II) of the Lower Butte Creek Restoration Project on the Butte Sink and Sutter Bypass West Side reaches and nearing completion on the White Mallard and Associated Diversions reach. (Objectives 1 and 6)

Yuba River

- Installed two (2) VAKI Riverwatchers at the fish ladders on Daguerre Point Dam. Data obtained from this technology will be used to determine fishery run-size, timing, and effective population size, and will also be used to test the accuracy of traditional carcass survey methods. (Objectives 3 and 4)
- Completed the final design for modification of the Narrows II power plant bypass to a 3,400 cubic feet per second (cfs) release capability ($4.5 million in CALFED funding was obtained for this effort). This project will ensure that required flow minimums and flow fluctuation requirements are not violated if the power plant goes offline. (Objective 3)
- Completed construction of the Outflow Barrier at the Yuba River Goldfields. This barrier will block adult and juvenile access to the "Goldfields," an area with extensive sloughs that attract fish, but do not provide spawning or rearing habitat. (Objective 3)

American River

- Completed the River Corridor Plan for the Lower American River. This watershed management planning document identifies specific restoration actions necessary to achieve watershed goals essential to improve anadromous fish production. (Objectives 1 and 6)

Cosumnes River

- Completed a Chinook salmon redd inventory in the fall-winter 2002-03 period. Of the approximately 400 fall-run Chinook salmon redds inventoried, half were located upstream of Granlees Dam, indicating passage of fall-run Chinook salmon was successful upstream of the retrofitted fish ladder. Fry and juvenile salmon were observed between February and June and a substantial emigration of juvenile fall-run Chinook salmon coincided with high flows in spring 2003. Substantial numbers of the non-native redeye bass were also observed between Dillard Road and Michigan Bar. This species is a potential competitor and predator of juvenile salmonids. Consequently, a control/eradication program for this introduced species is being considered. (Objectives 2, 3, and 4)

Calaveras River

- Conducted carcass surveys for Chinook salmon in the fall 2002-winter 2003 period. (Objective 4)
- Completed a progress report documenting the size composition and timing of fry and juvenile Chinook salmon movement below Bellota Weir. (Objectives 2 and 4)
- Conducted an electroshocking survey in June 2003 that revealed 69 juvenile rainbow/steelhead in Mormon Slough during the irrigation season, just below the town of Bellota. (Objectives 2 and 4)
- Created the Calaveras River Fish Group to provide technical expertise to stakeholders on anadromous fish and fisheries issues in the Calaveras River. (Objective 6)

Stanislaus River

- Continued field-testing a fish counting weir to help evaluate fall-run Chinook salmon and steelhead escapement on the Stanislaus River. Additionally, an infrared fish counter with digital photo capability is being evaluated. These technologies, in combination, could vastly improve the ability to accurately assess salmon and steelhead escapement and are vital to assessing the AFRP doubling goal. http://www.stanislausriver.com (Objective 4)
- Completed the first draft of a plan to restore anadromous fish habitat in the Stanislaus River. The plan is being written under the guidance of the Stanislaus River Fish Group, a technical committee with representation from many State and Federal agencies and consulting firms who have experience with salmon in the local area. (Objectives 1 and 6) http://www.delta.dfg.ca.gov/srfg/.
- Completed annual rotary screw trap monitoring efforts at Caswell State Park. Interior, through CVPIA actions, is partnering with local irrigation districts to conduct rotary screw trapping at the downstream end of the spawning area on the Stanislaus River, as well as at its confluence with the San Joaquin River. Results from this monitoring will be used to evaluate salmon responses to flow and restoration actions. (Objective 4)

Tuolumne River

- Completed channel and floodplain restoration work at the 7/11 materials restoration site. (Objective 1)
- Completed preliminary design engineering and initiated environmental permitting and right of way acquisition on the Warner-Deardorff channel and floodplain restoration site in preparation for this Ecosystem Restoration Program funded/AFRP managed project. (Objectives 1 and 6)
- Produced a draft Sediment Management Plan to guide future gravel augmentation management practices. (Objectives 1 and 4)

Merced River

- Supported the hydraulic modeling of the Robinson Ranch Reach to ascertain and quantify the fish habitat benefits of the restoration project completed earlier. The AFRP contracted with the Service's Energy and In-stream Flow Branch to conduct Physical Habitat Simulation studies of the area. A draft report of the associated findings was provided in December 2003. (Objective 4)

- Completed preliminary engineering and design for restoring the lower Western Stones site and initiated coordination with affected landowners. (Objectives 1 and 6)

San Joaquin River Mainstem

- Completed and incorporated San Joaquin River National Wildlife Refuge wetlands plans into hydraulic modeling efforts funded by AFRP to evaluate proposed non-structural flood control management alternatives on the Refuge. (Objectives 1 and 4)

San Jaquin Basin

- Completed a draft feasibility study report on the development of a long-term aggregate source for San Joaquin River tributary channel restoration projects. (Objectives 1 and 4)
- Completed a draft riffle atlas report documenting the presence of spawning riffles on the Stanislaus, Tuolumne, and Merced rivers. (Objective 4)

In addition to the activities and accomplishments listed above, the AFRP provides a portion of its funds for the evaluation of the instream flow needs of anadromous fish (see below).

Project Title: **Evaluation of Anadromous Fish Instream Flow Needs CVPIA Section 3406(b)(1)(B)**

FY 2003 Funding: **$507,438 (provided by AFRP)**

FY 2003 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. They specifically directed that the instream flow necessary to protect all life stages of anadromous fish on CVP-controlled stream were to be determined by the Service after consultation with DFG. 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 2003 accomplishments and activities taken to identify those needs include the following:

- A final report was issued on fall, late-fall and winter-run Chinook salmon and steelhead spawning on the Sacramento River between Keswick Dam and Battle Creek. Hydraulic modeling of juvenile rearing and macroinvertebrate habitat in this same reach was also completed. Work continued on the modeling of fall-run Chinook salmon spawning habitat between Battle Creek and Deer Creek and a report should be completed in FY 2004. We completed development of juvenile Chinook salmon rearing habitat suitability criteria.
- For Butte Creek, a peer reviewed final report on flow-habitat relationships for spring-run Chinook salmon spawning was completed and issued in FY 2003.
- For the Lower American River, a final report was issued comparing PHABSIM and

2-D modeling of steelhead and fall-run Chinook salmon spawning.

- Collection continued of hydraulic modeling and Habitat Suitability Criteria data on the Yuba River for spring-run and fall-run Chinook salmon and steelhead spawning, and completion of data collection (except for steelhead habitat suitability criteria) is expected in FY 2004.

Project Title: **Habitat Restoration Program**
CVPIA Section 3406(b)(1) "Other"

FY 2003 Funding: **$1,500,000**

FY 2003 Accomplishments:

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

The program began in FY 1996 and since then has funded 53 projects located throughout the Central Valley at a cost of approximately $18,000,000. Approximately 91,229 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 2003, 10 conservation actions were funded at a cost of $1,285,215. Three of these actions provided additional funding to continue projects that were initiated in previous years. These included continuation of riparian brush rabbit captive propagation and recovery program activities, including trapping, monitoring and genetic and physical assessments; continued monitoring for giant garter snakes at the habitat restoration site 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 seven actions that were new to the program in FY 2003 are:

- Funds were provided to the Western Section of the Wildlife Society to assist HRP managers in hosting a workshop entitled, *Opportunities for Endangered Species Recovery and Habitat Restoration in California's Central Valley*. The successful two-day workshop was held on April 2-3 and was attended by approximately 150 individuals from varying conservation interests.
- Funds were provided to the American River Conservancy to design and construct a new pond for potential California red-legged frog breeding habitat below Spivey Pond on Weber Creek in El Dorado County. The goal of the project is to increase critical reproductive habitat within two years of the proposal's acceptance and provide an aggressive and adaptive strategy for increasing California red-legged frogs through natural colonization.

- Funds were provided to TNC to contribute (approximately 20 percent) toward the acquisition of a perpetual conservation easement on approximately 2,865 acres in the northeastern edge of San Joaquin County in the Cosumnes River watershed. This ranch has a high density of vernal pools and associated listed species, and is part of TNC's Vernal Pool Grassland Focus Planning Area. The property also has strong project connectivity values due to its proximity to Howard Ranch, an easement acquired by TNC in 1999.
- Funds were provided to the Endangered Species Recovery Program at California State University-Stanislaus, to conduct demographic monitoring of palmate-bracted bird's beak at Alkali Sink Ecological Reserve in Fresno County. This monitoring will determine population stability and effects of road disturbance. The study will also bank seeds from Springtown Alkali Sink and the Sacramento National Wildlife Refuge.
- Funds were provided to the Cottonwood Creek Watershed Group to perform "start up" work on California red-legged frogs in the Cottonwood Creek watershed. This preliminary effort will complete aerial photographs of potential habitat areas in the watershed and begin obtaining landowner permission to conduct surveys for California red-legged frogs on private lands. The Cottonwood Creek watershed has been identified as a "core area" in the California red-legged frog recovery plan.
- Funds were provided to ECORP Consulting to survey/trap southern water snakes on Willow Creek and Humbug Creek, tributaries of the American River above Lake Natoma. This project will help establish baseline data regarding the status of this invasive reptile, which may pose a threat to the recovery of the listed giant garter snake.
- Funds were provided to the Endangered Species Recovery Program and California State University-Stanislaus, to conduct population surveys and perform phylogenetic analyses of the Buena Vista Lake shrew in the southern San Joaquin Valley. The survey will help to assess population levels of the species while the phylogenetic analyses will investigate the genetic variability within and among the geographic subpopulations of the species. This data could have importance when determining the species listing status.

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

FY 2003 Funding: **$1,500,000**

FY 2003 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 *Natural Resources Defense Council (NRDC) v. Rodgers* lawsuit. The Friant Water Users Authority, NRDC, and Pacific Coast Federation of Fishermen's Associations were the original parties. The SJRRHRP provides funding for proposed or on-going efforts to restore riparian habitat and functions

along the San Joaquin River and experimental programs and activities that support the data gathering necessary for the *NRDC v. Rodgers* settlement discussions.

FY 2003 actions and accomplishments include the following:

- Continued funding for the Endangered Species Recovery Program to conduct quarterly small mammal surveys along the San Joaquin River from Friant Dam to the Merced River confluence.
- Provided funding to the San Joaquin River Parkway and Conservation Trust, Inc. to prepare a background report on the invasive plant species located in the SJRRHRP study area. Funding was also provided to DWR to prepare more detailed mapping of the location of the prioritized invasive species targeted for removal. Initiated efforts to define what would be required to reduce the amount of aquatic invasive species (e.g. parrot's feather) in the San Joaquin River downstream of Friant Dam.
- Provided major funding for a two-day multi-agency sponsored "Teach the River" symposium conducted for San Joaquin Valley area educators and paraprofessionals.
- Funds were provided for the development of a present-day fishery and aquatic species inventory by DFG in the watered reaches of the San Joaquin River between Friant Dam and the Merced River confluence
- Provided funding and technical support, through The Bay Institute, for the San Joaquin River Parkway and Conservation Trust, Inc. for restoration of five acres of vegetation at Camp Pashayan after a fire destroyed portions of the original restoration of 2002.
- Facilitated the clean up of 149-river miles of the San Joaquin River through the cooperative efforts of private landowners, business owners, water districts, and water authorities in the SJRRHRP study area.
- Continued development of a restoration plan for the 167-acre parcel Jensen River Ranch property that borders the San Joaquin River. This property was one of the first acquired by the CVPIA Habitat Restoration Program. Facilitated the review of the Biological Assessment (BA) and initiated ESA Section 7 consultation with the Service.
- Continued support of restoration planning and design preparation by DFG, DWR, and the San Joaquin River Parkway and Conservation Trust, Inc. on the 286-acre Milburn Unit and the 33.6-acre Hansen Farm, both, located in the San Joaquin River Ecological Reserve that borders the San Joaquin River.
- Initiated efforts to have five SJRRHRP water quality monitoring stations installed in the San Joaquin River between Friant Dam and the Merced River confluence to provide data on a variety of water quality parameters beneficial to river restoration planning.
- Initiated efforts to determine what would be required to complete digitizing and mapping of existing soils information and conduct new soil mapping to help establish soils and habitat type relationships essential for restoration and riparian re-vegetation along the San Joaquin River.

Project Title: **Management of Dedicated CVP Yield for Environmental Purposes**
CVPIA Section 3406(b)(2)

FY 2003 Funding: **$1,000,000**

FY 2003 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 yield, identified the method of accounting for use of the dedicated CVP yield pursuant to CVPIA, set out procedures for management of the yield, and listed potential measures which may be prescribed by the Service for use of the dedicated yield. 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 yield to comport with the Courts' rulings and, in May 2003, issued a "Revised Decision on Implementation of Section 3406 (b)(2)"a Revised Decision on implementation of 3406(b)(2). This revised decision was implemented beginning in October 2003. In the interim, use and management of the 800,000 af of dedicated yield will be governed by the methodology outlined in the 1999 "Final Decision on Implementation of Section 3406 (b)(2)."

Reclamation, Service, National Marine Fisheries Service (NMFS), DWR and DFG 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 2003, work continued on development of an updated Operations Criteria and Plan (OCAP) for the CVP. The updated OCAP will reflect flow objectives being established for anadromous fish, the revised decision on implementation of the dedicated water, and the EWA.

The "Final Decision on Implementation of Section 3406(b)(2)" was implemented for the third consecutive year and coordinated with the second year implementation of the EWA. The dedicated project yield was used to implement upstream actions and several Bay-Delta actions consistent with the Final (b)(2) Decision as modified by the Federal District Court's March 2002 order. These measures contributed to the CVPIA's goal of doubling natural production of anadromous fish and providing 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.

Project Title: **Water Acquisition Program**
CVPIA Section 3406(b)(3)
FY 2003 Funding: **$13,221,000**
FY 2003 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 yield and to assist in meeting the CVPIA requirements for refuge water needs (approximately 159,000 af for Level 4 refuge water supplies). In FY 2003, the Water Acquisition Program continued efforts to:

- Provide supplemental refuge water supplies (Incremental Level 4) through annual purchases.
- Investigate the potential of using groundwater resources, including conjunctive use, to augment the incremental Level 4 supplies.
- Provide additional instream flows in support of the San Joaquin River Agreement and the Vernalis Adaptive Management Plan (VAMP).
- Provide flows for out-migration, migration, holding, spawning, and rearing habitat for anadromous fish in key Central Valley tributaries.
- Develop a long-term plan for instream and refuge water acquisitions.
- Identify water acquisition priorities for anadromous fish pursuant to Section 3406(b)(3) of the CVPIA.
- Develop technical guidelines for water right appraisal and acquisition.

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 2003 is provided in the following table:

Delivery Period	Seller	Quantity (AF)	Cost	Cost per AF	Purpose
Oct-Dec 02	Merced I.D.	12,470	$785,984 (FY02 funds)	$63.03	Fall attraction flows and habitat improvement in Merced River and lower San Joaquin River (SJR)
Apr-May 03	SJR Group Authority	58,065	$4,303,028	N/A	Vernalis 31-day pulse flow
Apr-Aug 03	Oakdale I.D.	20,961	$1,257,660 (FY02 funds $64,016)	$60	Stanislaus River and lower SJR flows, water quality, other New Melones purposes
May-Dec 03	SJR Exchange Contractors	60,000	$7,200,000	$120	Contract yr. 2003 Level 4 Refuge Water
Aug-Dec 03	Westside Mutual Water Company	10,000	$1,300,000	$130	Contract yr. 2003 Level 4 Refuge Water
TOTALS		161,496	14,846,672*		

- - Total cost for FY 2003 includes expenditure of funding allocated in FY 2002.

Project Title: **Tracy Fish Facilities Improvement Program**
CVPIA Section 3406(b)(4)

FY 2003 Funding: **$7,000,000**

FY 2003 Accomplishments:

The goal of the Tracy Fish Facilities Improvement 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 accomplish this, construction of a Tracy Fish Test Facility (TFTF) adjacent to the existing Tracy fish salvage facilities in the South Delta is proposed. The TFTF will develop and evaluate new fish screening and salvage technology for possible use at both the Federal and State Delta export facilities (Tracy and at Clifton Court Forebay), and/or at a possible screened through-Delta facility on the Sacramento River. The completed facility will include a 250 to 500 cfs test channel, new state-of-the-art fish screens, new fish friendly lifts, holding and sorter facilities in one large enclosed building, fish transfer/off loading facilities to fish tanker trucks, debris and sediment management structures, and support infrastructure including laboratory, office, and maintenance buildings. It is being designed by Reclamation with oversight and assistance from a multi-agency coalition of fish facility experts pursuant to a "Project Management and Organization Agreement" and an approved "Project Management Plan." Although being implemented as part of the CVPIA, the project is integral to DWR's South Delta Program. Funding sources include appropriations from Reclamation and the State of California.

Until the TFTF is completed, research on fish protection technology is ongoing at Reclamation's Denver research labs, at the existing Tracy Fish Protection Facility, at the Red Bluff Diversion Dam Pumping Plant, and at the University of California-Davis. The TFTF is currently on hold due primarily to cost concerns and is being reassessed by the CALFED South Delta Fish Facilities Forum. A final decision on the TFTF project is due in FY 2004.

Research activities conducted in FY 2003 include:

- Laboratory evaluations of the TFTF fish sorting and holding tank physical model.
- Leaky louver and fish crowder studies using the Denver large flume for TFTF.
- Fish passage trials using the internal helical pumps and archimedes lifts at Red Bluff and TFCF.
- Experimental investigations of a circular fish separator concept.
- Light traps for collecting early life stages of fish at TFCF.
- Mathematical model of fish behavior in screened channels.
- Evaluation of dual-frequency identification sonar for direct observation of fish movement and behavior near structures.
- Development of data management technical web site and enhanced data accessibility.

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 2003 Funding: **$245,000**

FY 2003 Accomplishments:

CVPIA directs Interior to develop and implement a program to mitigate for fishery impacts associated with the operation of the Contra Costa Canal Pumping Plant #1 at Rock Creek and indicates that the program shall provide for construction and operation of a new fish screen and recovery facilities, and for modification of operations and practices. 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 DFG, DWR, the Service, Reclamation, NMFS, 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 to explore cost saving alternatives.

In FY 2002, 90 percent of the designs and environmental documents for the project were completed. Further, a cost-share agreement with the State of California for the project was signed in FY 2002. In addition, the Contra Costa Water District is conducting a number of studies. These include the Los Vaqueros Reservoir Expansion Study, the Rock Slough Water Quality Improvement Study, and various ecosystem restoration projects and studies. All these studies and projects have the potential of significantly altering the currently designed fish screen facility at Rock Slough or potentially eliminating the need for a screened diversion.

As a result of these developments, alternative short-term, lower cost fisheries mitigation measures such as short-term operational flexibility, alternative exclusionary measures, and/or monitoring and salvage procedures are currently being investigated and developed through an interagency team consisting of Reclamation, the Service, NMFS, DFG, DWR, and the Contra Costa Water District. Progress toward completion of a fish screen project will continue but will be scheduled so as to fully consider the results of the Contra Costa Water District's studies. Preliminary study results have caused the interagency teams to re-evaluate the study program.

In FY 2003, the interagency team developed an expanded fish-monitoring program. This program is expected to be implemented beginning in FY 2004. In addition, with the development of alternative short-term fishery mitigation measures, Reclamation has presented these measures to the Service, NMFS, and DFG, with a request for an amendment

to the Los Vaqueros BO for delta smelt. The amendment would extend 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.

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.

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

FY 2003 Funding: **$50,000**

FY 2003 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 DFG and DWR, 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.

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 DFG, was released in December 2001. The American River Operations Work Group met monthly throughout FY 2003 to discuss both the American River operations and to determine threshold flows and ramping rates required to protect Lower American fishery resources. In June 2003, Reclamation sponsored a weeklong meeting entitled *A Lower American River Workshop*. A report of the proceedings, including a complete list of proposals, will be released soon.

The Stanislaus River flow fluctuation study was started in 1999 and is currently ongoing. The draft report of that study is expected to be released by the end of calendar year 2003. 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 2003 Funding: **$1,500,000**

FY 2003 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 Valley National Wildlife Refuge complex.

The formulation of alternatives in the first four years of the Red Bluff Diversion Dam (RBDD) Fish Passage Planning Program has led to the general recognition that operations implemented in response to the 1993 BO for winter-run Chinook salmon are very effective. The increased duration of gate removal at RBDD prompted by the BO dramatically improved baseline conditions for anadromous salmon and changed the standard against which additional measures to minimize fish passage problems would be measured.

However, pending decisions by the Secretary concerning operations of the Trinity River Division and the SWRCB concerning water quality standards in the Delta, and current judicial decisions/litigation in the San Joaquin Valley, all have the potential to significantly impact CVP operations and flows in the Sacramento River at RBDD. In addition, the Tehama-Colusa Canal Authority is investigating off-stream storage adjacent to the Tehama-Colusa Canal as part of a long-term solution to ecosystem restoration and water supply reliability problems. This project also could dramatically impact the operation of the RBDD and the associated canal system.

In FY 2002, a BA and a draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Red Bluff Diversion Dam Fish Passage Program Improvement Project were prepared and made available for public review. The document focused on alternatives for the solution of the fish passage problem at RBDD. Work on these documents was suspended pending completion of a new ESA Section 7 consultation on the OCAP for the CVP as a whole and is not expected to be re-initiated until next fiscal year.

In FY 2003, 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, NMFS, DFG, and DWR. In addition, progress was made toward installation of a fourth pump in the Red Bluff Research Pumping Plant. 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 2003 Funding: **$600,000**

FY 2003 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 2003, the activities and accomplishments of the Clear Creek Restoration Program included:

- Continuation of Clear Creek monitoring efforts. Ongoing monitoring involves salmonid use of restored habitat, fish stranding and passage, juvenile salmonid out-migration, adult population estimates, spawning gravel quality, redd mapping, stream flows, water temperatures, groundwater, channel geomorphology, bedload movement, riparian vegetation, wetlands, and neo-tropical migratory bird populations.
- Evaluation of the newly completed Phase 3A of the Clear Creek stream channel restoration project. These evaluations indicate that Phase 3A successfully restored natural geomorphic form and process. U.S. Geologic Survey and University of Montana mercury studies indicate that the restoration project has not had an adverse impact.
- Re-vegetation of 10.4 acres of floodplain reconstructed in Phase 3A. Monitoring indicates that neo-tropical migrant songbird diversity and population sizes are increasing in Clear Creek restoration areas.
- Using a portion of the CVP yield dedicated pursuant to Section 3406 (b)(2) of the CVPIA, provided an experimental pulse flow in September 2002 to minimize hybridization of fall and spring-run Chinook salmon.
- The addition of 12,000 tons of spawning gravel to four locations: Placer Bridge, City of Redding, Clear Creek Road Bridge and Reading Bar. Monitoring indicates that steelhead is spawning in injected spawning gravel areas.
- Participation in AFRP and Authority's Ecosystem Restoration Program sponsored Adaptive Management Forum for Large Scale Stream Channel Restoration Projects.
- Re-initiation of work on the Clear Creek Decision Analysis Model, begun with Ecosystem Restoration Program funding. This model is to be used in the evaluation of benefits and costs to power generation, anadromous salmonid populations, and stream geomorphology associated with large managed flow releases.

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

FY 2003 Funding: **$500,000**

FY 2003 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 a total of 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 2003 include:

- Approximately 8,800 tons of salmon spawning-sized gravels were purchased in September 2003 for placement on the right bank of the upper Sacramento River immediately below the confluence with Salt Creek.
- The monitoring program on the lower American River was continued, documenting the use by salmon, the location of spawning redds, and evaluating the quality of treated versus untreated salmon spawning areas.
- On the Stanislaus River, streambed cross sectional elevations were made pre- and post-gravel placement. Underwater snorkeling for salmon in the vicinity of gravel placement sites was continued. An evaluation of alternative methods of gravel placement in difficult access areas was completed.

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

FY 2003 Funding: **$500,000**

FY 2003 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, CAMP funded DFG 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 credible salmonid stock monitoring, along with spawning population surveys and ocean catch estimates which are provided by other entities and/or programs not part of the CVPIA effort

Because of CAMP budget cuts, funding for the Delta tow-net survey and striped bass monitoring had to be discontinued in FY 2003. Funding for the juvenile studies on the Yuba, Merced, and Tuolumne Rivers had been discontinued the previous year. The Central Valley angler survey was reduced in scope from the entire Central Valley to the upper main-stem of the Sacramento River.

In past years, CAMP also provided funding to the Interagency Ecological Program to house and maintain the CAMP monitoring database and a CAMP Internet homepage on the DFG server in Stockton. CAMP was unable to provide funding for these two elements because of budget limitations in FY 2003. The homepage has not been updated for several years

Activities and accomplishments in FY 2003 were as follows:

- Field data for the Central Valley angler survey were collected for the upper main-stem of the Sacramento River but for only part of the normal field season. This was due to a freeze on hiring of State employees that was imposed in early summer of 2003. Interior and DFG are working together to summarize and evaluate the data from the truncated study.
- Work progressed on annual reports of findings on anadromous salmonid adult production and salmon juvenile migration in 2001 and 2002. These annual reports are prepared after escapement data are confirmed by the DFG, which usually occurs one or two years after data are collected. The report on 2001 and 2002 data is scheduled for completion in December 2003.

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

FY 2003 Funding: **$1,000,000**

FY 2003 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 four-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 2003 accomplishments include the following:

- Completed the three-year program for monitoring the effectiveness of terrestrial mitigation measures associated with construction of the project's fish screen component. The mitigation program associated with the elderberry transplanting and associated plants have been successful. This program is completed. Mitigation associated with the gradient facility continues.
- Fiscal year 2003 was the third year of hydraulic testing and the second year of biological testing of the four-year testing/operation optimization program. The Glenn-Colusa Irrigation District, Reclamation and the Corpse of Engineers hired an independent monitor to review this program. The monitor determined that gradient facility was slightly overbuilt and the fish by-pass system was operating as designed. Not all elements of each testing program were completed.
- Completed the lower bypass channel recapture structure. Started preliminary design of the bypass pipe recapture structure.

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

FY 2003 Funding: **$4,433,000**

FY 2003 Accomplishments:

The Anadromous Fish Screen Program (AFSP) serves two functions in its efforts to protect juvenile anadromous fish from the effects of 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 and AFSP funds are expended on a biological priority basis. The AFSP is closely coordinated with the Authority's Ecosystem Restoration Program, a potential source of additional funds that can help to bring a needed project to fruition.

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 Program or contemplating participation, and to their consultants, throughout the various phases of project planning and implementation.

The AFSP has funded projects at diversions ranging from 17 cfs up to 1,000 cfs, installing civil engineering works allowing them to take water for authorized purposes, while leaving the juvenile fish in the waterway unharmed. Every project funded by the Program is a multi-year effort, with funds being provided first for feasibility studies, and then for engineering and design, for construction, and, finally, for start-up testing. Consequently, accomplishments reported in any given year may be the result of funding first provide several years earlier. Through FY 2003, the AFSP has been responsible for the construction of 20 screens and the removal of 14 diversions. Approximately 2,800 cfs of diverted water in Central Valley streams is now fish-safe as a result. Currently, the Program is involved with nine diverter applicants, each in various phases of project development from feasibility study to construction.

Accomplishments in FY 2003 include the following:

- Construction was completed on a fish screen at the City of Sacramento's diversion on the American River for which the AFSP provided funding. This diversion facility, including an associated water treatment plant, is being doubled in size. The AFSP, however, provided cost-share funding for only the fish screen facility and only that portion of the fish screen facility equal to its maximum historical diversion rate. Costs associated with the increase in diversion were the responsibility of the City. Completion of the screen project will ensure year round protection from entrainment of several special status species, including fall-run Chinook salmon, Central Valley steelhead, Sacramento splittail, and delta smelt, as well as resident game and non-game fish.

  At the City's Sacramento River intake, the original structure was inadequately screened, and a modern fish screen could not be retrofitted to the structure. Thus, a new diversion facility is being constructed immediately downstream of the original, with a fish screen structure that meets modern DFG and NMFS screen criteria. Because this diversion is in an area occupied by delta smelt, the fish screen was designed to meet the more stringent delta smelt protection criteria. Cost-share funding was provided only for features of the project required for screening and protecting fish. The screen portion of the project has been completed and only minor work remains on the other features before the facility can be placed in operation.
- Construction was completed in FY 2003 on a fish ladder, flashboard flow control structure, and fish screen at Weir #5, a diversion facility on the west side of the Sutter Bypass. This effort is a part of the Lower Butte Creek Project dealing with fish passage at several relatively small diversions on Lower Butte Creek, Butte Slough and the bypass. The completed Weir #5 project, along with the suite of other completed fish passage and fish screen diversion improvements along Lower Butte Creek funded by the AFSP, the AFRP, and other sources, facilitates better fish passage through the lower Butte Creek system and protects listed species such as fall

and spring-run Chinook salmon, Central Valley steelhead, and other fishes from entrainment.

- Prior year AFSP funding (from FY 1999 through 2002) has resulted in the completion in FY 2003 of engineering feasibility studies and/or reconnaissance studies, the initiation of environmental documentation, and the initiation of final designs for the:
  - Natomas Mutual Water Company;
  - Sutter Mutual Water Company;
  - Reclamation District 108;
  - Meridian Farms Water Company; and
  - Pleasant Grove/Verona Water Company
- Also in FY 2003, the Ecosystem Restoration Program committed $15,886,650 through their Proposal Solicitation Process to help make up the required non-Federal cost share for AFSP funded projects. These non-Federal funds were awarded to:
  - Natomas Mutual Water Company;
  - Sutter Mutual Water Company;
  - Reclamation District 108;
  - Meridian Farms Water Company; and
  - M&T Ranch and Llano Seco Wildlife Refuge.

  The AFSP Technical Team assisted with the evaluation of the screen project proposals and the subsequent recipient agreement processes in FY 2003.
- The University of California - Davis is completing the research studies funded by the AFSP in FY 2001. These studies include performance tests of fish under the influence of various fish screen diversion conditions. Behavioral observations for species of different sizes, at different temperatures and time of day, and at different approach and sweeping velocity combinations have been ongoing. Fish injury and latent mortality are also being investigated. Results will be presented in draft form for the AFSP technical team and others for peer review. This effort will be fully completed in FY 2004.

Project Title: **Agricultural Waterfowl Incentives Program**
CVPIA Section 3406(b)(22)

FY 2003 Funding: **$0**

FY 2003 Accomplishments:

The CVPIA authorized Interior to provide monetary incentives to farmers to keep agricultural fields seasonally flooded when such flooding would provide habitat for wintering migratory waterfowl. Up to but not more than $2,000,000 per year could be expended on this program, which expired after the expenditure of FY 2002 funding. Funds had been available and were used to enroll fields with waste grains into the program since the winter of 1997-98, when 41 landowners flooded and set aside 22,314 acres for waterfowl use. From that first year, interest in the program grew steadily and the acreage enrolled increased steadily, limited primarily by the availability of funds. An average of 40,000 acres

per year was flooded over this period, with a high of 58,000 acres being enrolled in the winter of 2000-2001.

Using FY 2002 funds, 50 landowners enrolled in the program and 32,000 acres of agricultural lands were flooded over the winter of 2002-2003 (in FY 2003) to provide much needed habitat for waterfowl in the valley.

Project Title: **Trinity River Restoration Program**
CVPIA Section 3406(b)(23)

FY 2003 Funding: **$7,000,000**

FY 2003 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 analyzing 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 "Record of Decision" 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 funded by CVPIA.

Accomplishments specifically related to the bridge replacement/reconstruction projects on the Trinity River and achieved in FY 2003 are as follows:

- Hydrologic analysis of the Trinity River watershed upstream of the four bridge sites.

- Hydraulic modeling for all bridge locations.
- National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) compliance for all four bridges.
- Completed designs, permitting, and realty actions for the Salt Flat and Biggers Road bridges.
- Preliminary design and environmental compliance for the Hocker Flat channel rehabilitation site.

Project Title: **Refuge Water Supply Program – Water Conveyance (Wheeling) Component**
CVPIA Section 3406(d)(1-5)

FY 2003 Funding: **$7,800,000**

FY 2003 Accomplishments:

The CVPIA directs Interior to provide long-term, reliable water supplies of water 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 *or* to acquire the conveyance capacity from non-Federal entities for them to "wheel" the water to the refuge areas.

Apart from the Water Acquisition Program (which was described above), the Refuge Water Supply Program consists of three separate but highly coordinated components to deliver the requisite supplies to the identified refuge areas. These are the Water Conveyance "Wheeling" Component (to acquire conveyance capacity from non-Federal entities) and two construction components - the Facilities Construction Component (set up to construct needed facilities to deliver water to the State and Federal refuges and to the Grasslands) and the San Joaquin Basin Action Plan Component (to construct the features necessary to deliver 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 do have the conveyance capability. As of the end of FY 2003, nine long-term (25-30 year) conveyance cooperative agreements (wheeling agreements) are in place and being used to deliver water to certain refuge units. 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 2003 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 2003 activities and accomplishments of note include:

- 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.
- Participated in the long range planning study "Evaluation of Groundwater Potential for Level 4 Refuge Water Supplies".
- Initiated development of refuge water quality goals and a programmatic monitoring program.
- Negotiated a new 25-year conveyance agreement with Buena Vista Water Storage District for conveyance of water to the Kern National Wildlife Refuge.
- Negotiated a new 25-year conveyance agreement with Biggs-West Gridley Water District for conveyance of water to the State's Gray Lodge Wildlife Area.
- Negotiated an agreement with DFG for pumping groundwater at Gray Lodge.
- Continued negotiation of a new 5-year contract with DWR for conveying water to the Kern National Wildlife Refuge.
- Discussed the evaluation of the potential for using Butte Creek as a conveyance system for water deliveries to Sutter National Wildlife Refuge with DFG and DWR. Changes in conditions from those outlined in the initial conveyance planning and NEPA documents may make additional analysis of this conveyance alternative appropriate.
- Continued development of an integrated database for refuge water supply accounting, delivery scheduling, tracking, invoicing, and development of a Level 4 water audit.
- Initiated development of a report highlighting specific biological benefits documented on refuge units since the implementation of the refuge provisions in CVPIA.
- Coordinated with the staff from the Authority'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.
- Initiated a project for the installation of new water measurement devices for the San Luis National Wildlife Refuge through a cooperative effort with the Grassland Water District.

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

FY 2003 Funding: **$4,300,000**

FY 2003 Accomplishments:

The Facilities Construction component of the Refuge Water Supply Program was developed to provide the necessary infrastructure to support the delivery of long-term, 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, and Colusa National Wildlife Refuges has been completed. This entailed construction of the Stony Creek Siphon and approximately 127 other facilities, in partnership with the Glenn-Colusa Irrigation District, and acquisition of a conservation easement and restoration of habitat to support giant garter snakes to mitigate for construction impacts. All financial commitments with the Glenn-Colusa Irrigation District for this effort have been fulfilled. In addition, environmental commitments have been fulfilled pursuant to the Service's ESA BO for construction of conveyance facilities for the 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.

In FY 2003, the following activities and accomplishments were noted:

- Negotiations with the Biggs-West Gridley Water District were completed and a cooperative agreement signed. This major milestone is a precursor to design, permit acquisition, and construction of infrastructure to support conveyance of water supplies to the Gray Lodge Wildlife Area. Construction is expected to continue through FY 2006.
- Negotiations were also completed and a cooperative agreement signed with the Buena Vista Water Storage District, allowing design, permit acquisition, and construction of infrastructure necessary to deliver water supplies to the Kern National Wildlife Refuge to begin. Anticipated completion date for the facilities is late FY 2005.

Project Title: **Refuge Water Supply Program – San Joaquin Basin Action Plan Component**
CVPIA Section 3406(d)(1-5)

FY 2003 Funding: **$1,249,000**

FY 2003 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 and Reclamation had to find a replacement contractor to complete this project.

FY 2003 activities included:

- Completion of modifications to the San Luis Spillway headworks, located at the State's Volta Wildlife Area, five miles northwest of Los Banos. As indicated above, the contractor initially selected for the job defaulted and Reclamation, working with the bonding company and the Small Business Administration, hired a replacement contractor, AFA Construction, to complete the project. The completed work consisted of removing and disposing the existing structure and constructing two 12-feet wide radial gates.
- Continued progress on capacity and efficiency improvements to Central California Irrigation District facilities. Work was completed on the District's Spillway Ditch (Newman Canal Reach I thru III). The Spillway Ditch improvements will convey water to Reclamation's constructed Newman Canal for delivery to DFG's China Island Unit of the North Grasslands Wildlife Area in Merced County. The District completed phase one of the project last fiscal year and the rest was completed in this fiscal year. Design and right-of-way acquisition for the Cottonwood Lateral was completed and facility construction is expected to be completed during FY 2004.
- Continued progress on the Environmental Assessment 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. A Value Engineering Study on the proposed design was also completed.

Project Title: **Ecosystem/Water System Model Development Program**
CVPIA Section 3406(g)

FY 2003 Funding: **$800,000**

FY 2003 Accomplishments:

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

- 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;
- Review and update of the Central Valley Ground-Surface Water Model;
- 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);
- Development of the 3-D temperature model for Whiskeytown Reservoir; and

- 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, with FY 2003 demanding more staff time and resources than any earlier year. Reclamation and DWR 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 Ecological/Water Systems Operations Models 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, DWR, and private contractors all have staff capable of applying these models that have been trained under funding from this program.

Activities and accomplishments in FY 2003 are listed below:

- The staff of Reclamation's River Systems Analysis Branch and the Technical Service Center, personnel from the Service, and private contractors developed code and data and reviewed CALSIM II, and then conducted a three-day training session.
- Completed a comprehensive review of CALSIM II, including detailed annotation of the code and documentation.
- Updated present and future conditions hydrology for the San Joaquin Valley.
- Prepared a manual describing the procedure for developing the various time series of input that is required for CALSIM. This supports review of data and serves to replace what previously had been left to corporate memory.
- Continued development of the Land-Atmosphere-Water-Simulator (LAWS) model. This modeling system utilizes software that can extract crop types and acreage from LADSAT imagery, thus supporting development of data to more accurately model consumptive uses of water.
- Continued development through a private contractor of an algorithm with CALSIM II to simulate revised interpretations of the CVP yield dedicated pursuant to CVPIA Section 3406 (b)(2).
- Conducted a series of workshops open to planning and operations staff from Reclamation and DWR with the goal of developing a strategy for improving the allocation process within CALSIM II.
- Completed an initial effort at building a GIS representation of the CALSIM II coverage in support of improved documentation.
- Funded a distribution copy of a Sacramento River Chinook salmon life history model.
- Provided active support for the CALSIM ANN Refinement Team (CART).
- Continued advancement in CALSIM II's simulation of the Stanislaus River Basin.

Project Title: **Land Retirement Program**
CVPIA Section 3408(h)

FY 2003 Funding: **$3,473,796**

FY 2003 Accomplishments:

The CVPIA authorizes Interior to acquire irrigated agricultural lands that are drainage-impaired and which receive CVP water and retire them from agricultural production. The Agricultural Land Retirement Program was established to implement that provision. Purposes of the program are:

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

FY 2003 activities and accomplishments for the Land Retirement Program include:

- Acquisition of 293 acres of land and associated water from willing sellers in Atwell Island Water District. Total acreage acquired to date in Atwell Island is 5,861.
- Continued testing of various habitat rehabilitation techniques in replicated trials. Adaptive management techniques are implemented whenever indicated by monitoring results on retired lands. Four ancillary, replicated research trials were established in FY 2003 in response to adaptive management questions on ways to reduce competition between native plants and weedy species. These consisted of five half-acre treated study plots and five controls that included an Herbicide and Growth Form Trial, a Mowing Trial, a Burn Trial, and a Pre-Irrigation Trial.
- Continued management activities in addition to monitoring, data gathering and analysis for the Habitat Restoration Study at both the Tranquillity (ESRP) and Atwell Island (Bureau of Land Management (BLM)) study sites. All data collected for the study from 1999 to 2002 has been entered into databases, proofed, edited, and statistically analyzed.
- Established 50 miles of hedgerows (280 acres) on the Atwell Island project site and initiated restoration work on more than 100 acres, including planting out flamed grasslands, canal banks, tree poles and upland shrub planting in former alfalfa fields (approximately 20 acres) and 10 acres of shorebird habitat and planting. Cooperation with an organic farmer to grow-out alkali sacaton and indian ricegrass was initiated.
- Moved the Tranquillity native plant nursery to a site on better soil and near a more convenient water supply. Research on seed delivery, plant propagation, and seed production methods was conducted on 34 different locally collected native plant species. The nursery is being used to amplify seed stock, investigate efficient cultivation and grow-out methods, determine utility of species inclusion in restoration strategies, and assess species' applicability for mechanized seed production. Five species showed a high potential for mechanized production and harvest. Historical records for particular species were investigated, primarily from herbarium specimens and site-searches.
- Continued to monitor ground water levels and ground water quality in accordance with the Quality Assurance Project Plan at the Westlands Demonstration Project Site. Results

to date indicate a declining shallow water table in response to land retirement. Monitoring groundwater and soil conditions was begun at the Atwell Island Project Site.

- Published the third Land Retirement Demonstration Project Report, documenting the results of physical and biological monitoring efforts and adaptive management of retired lands.

  An electronic copy of this report has been posted at the Endangered Species Recovery Program website at http://esrpweb.csustan.edu/publications/pdf/Irdp/2002ar/.
- A presentation on the aspects and results of the project that deal with selenium contamination was given to the Service's Environmental Contaminants experts.
- Public Outreach activities included:
  - Tours were given to a variety of groups and individuals in 2003. Two tours for Service personnel from the Endangered Species Division were held at both the Tranquillity and Atwell Island sites. A site tour for 50 members of the Fresno County Economic Opportunity Council and I-5 Business Corridor was given. A tour for Dr. Ken Lair, Research Ecologist and Botanist from Reclamation's Denver Technical Services Center resulted in a cooperative effort being established for 2004 with the U.S. Department of Agriculture's Natural Resources Conservation Service Plant Materials Center in Lockeford, CA.
  - A science education program at Alpaugh School was initiated, with possible coordination with the California Institute of Biodiversity using CAL-Alive CD-ROM, their educators and the Atwell Island Land Retirement Restoration Project.
  - ESRP senior staff made two presentations at a professional conference jointly held by The Ecological Society of America and the Society for Ecological Restoration in Tucson Arizona. In addition, Steve Laymon of BLM gave presentations to local and regional community and conservation groups. He also organized the Annual Bird Count with birders from Point Reyes Bird Observatory and Sierra-Los Tulares Land Trust.
  - Our research partner, the Endangered Species Recovery Program, sponsored a student from the Center for Advances Research and Technology, who analyzed some of the small mammal data for her class project.

DISCUSSION OF CVPIA IMPLEMENTATION AND RESULTS

FY 2003 was the 11th year of CVPIA implementation. Over that period, hundreds of actions have been taken to help achieve the Act's goals and objectives. Many of these actions were procedural and, once implemented, fulfilled the statute's requirements. For other provisions however, particularly the fish and wildlife measures, progress towards attaining CVPIA goals and objectives will be gradual. The long-term, system-wide results of individual actions, or of many actions implemented in a single year, may not be manifested for many years and, when apparent, may not be attributable to a particular action but to a suite of actions over a long period of time. Consequently, reporting the response of the ecosystem to actions implemented in any particular year and separating that response from the results of work done in previous years is not practical. This is as true for FY 2003 as it is for any of the previous 10 years of CVPIA implementation.

Nevertheless, target fish and wildlife resources are responding to CVPIA measures. The long-term plans and programs developed as part of CVPIA appear to be achieving the desired results and the Act's goals and objectives are gradually being realized. The numbers of several species of anadromous fish returning to the Central Valley, including salmon and striped bass, are increasing. Salmon have returned to spawn in areas where they have not been seen for many years. Hundreds of thousands of ducks and 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 existing habitats for listed threatened and endangered species have been acquired and thousands more were restored and/or enhanced, clearly benefiting species on the brink and increasing their chances for recovery.

Anadromous Fish - Biological Response

Chinook salmon has been a high priority for CVPIA restoration efforts. The majority of the measures implemented and most of the $423 million dollars expended to benefit anadromous fish over the past 11 years have focused on this species. While the numbers of salmon along the west coast have generally declined, returns to the Central Valley and the catch off the California coast have increased significantly. These responses in Central Valley salmon populations correlate 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, other west coast fisheries have been subject to the same factors and, in many cases, similar conditions. It seems certain that factors within and unique to the Central Valley are largely responsible for the increasing salmon population trends we are experiencing valley-wide.

Clear Creek provides a good example of our focused work efforts that have produced a positive biological response. On Clear Creek, we have increased streamflows during critical periods for fall-run Chinook salmon; added spawning gravels to the stream; restored degraded portions of the stream channel, floodplain, and adjacent riparian habitats; and controlled erosion and sedimentation from sources within the watershed. McCormick-Saeltzer Dam, a major impediment to the upstream passage of salmon and steelhead, and an unscreened diversion at the dam 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 have improved greatly as a result of these measures. Spawning escapement of fall-run Chinook on Clear Creek, which in the 10 years before the CVPIA had averaged less than 2,200 fish, have increased to an average of more than 7,350 fish in the 11 years since. Just as importantly, improvement in flows and removing McCormick-Saeltzer Dam have made possible the restoration to Clear Creek of steelhead and spring-run Chinook salmon, both listed threatened species. Returns over the next several years should indicate whether there will be ecologically significant increases in numbers of these special status species and confirm 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, however, the results are very encouraging.

Very positive responses have been observed on several other streams where CVPIA efforts have been focused. Notable among these are Butte Creek, where spring-run Chinook returns have been steadily improving, and on the Stanislaus River, where newly placed gravels in the stream were almost immediately covered by spawning Chinook salmon. The Butte Creek spring-run spawning escapement, which averaged only 381 fish over the 1967-1991 baseline period, has increased to an average of nearly 7,000 fish since 1995 when restoration measures began to be implemented there. On the Stanislaus, spawning escapements of fall-run Chinook have increased ten-fold since measures were implemented there and in the Delta.

Salmon spawning escapement on several Central Valley streams, such as Clear Creek and Butte Creek, has, in some years, numerically reached or exceeded the CVPIA doubling goal for those particular streams. However, it is still unclear whether those runs represent sustainable natural production on a long-term basis. At a minimum, it will take several life cycles (three to five years per cycle) of continued monitoring under a variety of environmental conditions to make that determination. In addition, there are other streams where the production of salmon and other anadromous fish is lagging, still short of CVPIA targets. We may ultimately find that achieving the valley-wide CVPIA doubling goal for some species will occur only if some streams exceed their targets to offset those on which target levels cannot reasonably be met.

Refuges and Waterfowl – Biological Response

With the passage of CVPIA, a full and reliable supply of water to meet identified needs was made available to Central Valley State and Federal refuges and private wetland areas, and new seasonal habitats for waterfowl have resulted from keeping agricultural fields of waste grain flooded in winter. Waterfowl, shorebirds and other wetland-dependent wildlife have benefited from these actions as their habitats have been expanded and enhanced. Valley refuges report 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. In addition, these refuges are now providing habitat for longer periods of the year, attracting species that heretofore in the valley were absent or present only in very low numbers. In-valley production of many species has increased greatly whereas before, breeding habitat was unavailable.

In addition to these on-refuge habitat gains, the Agricultural Waterfowl Incentives Program funded the flooding of an average of 40,000 acres of private agricultural lands each winter, providing additional waterfowl habitat replete with a very nutritious food source. This, in turn, has helped to spread the birds in the valley out over a wider area and alleviate the overcrowding experienced in the past, particularly in the Sacramento Valley. Incidence of waterfowl disease-related mortality, usually caused by overcrowding – too many birds on too little habitat - or by stagnant water, has decreased markedly in the valley as birds take advantage of the greater habitat base and improved water quality conditions in these areas. Once frequent and widespread cholera outbreaks in the Sacramento Valley have been limited to one major incidence since 1992. Similarly, the Sacramento National Wildlife Refuge complex reports a nearly 89 percent decline in botulism since 1992 compared to the decade before the availability of CVPIA water supplies.

Water availability has also enhanced refuge managers' ability to provide a food supply for the winter migrants. Waterfowl food production has increased tenfold in some refuge areas. The Grasslands Resource Conservation District was able to increase its acreage of enhanced seed production from 4,000 acres in 1991-92 to an average of 26,000 acres from 1993 to 2003. In that same time period, there has been a doubling of plant biomass per acre.

Waterfowl use has increased nearly as much. In the Grasslands, waterfowl use in the early fall increased by 300 percent: other areas have 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. The Sacramento National Wildlife Refuge complex experienced a 61 percent increase in visitor use.

Species other than waterfowl have benefited from the water provided to the refuge areas. Sacramento Valley refuges report increased use by western pond turtles and colonial nesting birds, such as the tri-colored blackbird. Refuges in the San Joaquin Valley have noted increases in populations of giant garter snake and in the nesting of western, Clark's, and eared grebes; black-crowned night herons; and tri-colored blackbirds. Valley-wide, shorebird use on shallow wetlands has increased by hundreds of thousands as sandpipers, dunlins, yellowlegs, phalarope, and dowitchers respond to the increased wetland acreage and their invertebrate

food supply. More than 150 species of other birds, 20 species of butterflies, 15 species of dragonflies, five species of reptiles, two species of amphibians, and 10 species of mammals have been reported using these enhanced habitat areas in the North Grasslands Wildlife Area alone.

White-faced ibis and sandhill cranes provide a stellar example of how the availability of adequate water supplies has 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 returns started slowly. Sutter National Wildlife Refuge, for example, hosted 100 white-faced ibis in 1991. That number has increased to 1,000 birds in 2000, 7,000 in 2001, and a staggering 15,000 ibis in 2002. Kern National Wildlife Refuge had a similar experience, with 50 ibis in 1991 and more than 5,600 in 2001. Pixley National Wildlife Refuge supported 200 sandhill cranes in 1992 when the CVPIA was passed. They received their first allocation of CVPIA water in 1993 and provided habitat for more than 2,000 cranes that year. By 2001, the number had risen to 5,100 sandhill cranes.

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 91,000 acres and the restoration of more than 1,100 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. 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 natural 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 Agricultural 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. These groundwaters are highly saline water and have high concentrations of selenium and boron that can kill plant and animal life exposed to it. Land retirement, restoring retired lands, and use of those lands by wildlife have 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.

Instead of adverse impacts, treating these lands has led to increased abundance and diversity of wildlife. Increased invertebrate species and abundance have included 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, three of which successfully nested in the 2002 season. Populations of small mammals increased substantially

on retired lands. Three special status mammalian species were found on restored land at Atwell Island, including a San Joaquin kit fox observed using the hedgerows just established this fiscal year.

CONCLUSIONS

Since enactment of the CVPIA, Interior has done a great deal to implement its provisions and to attain the goals and objectives set by Congress. In response to the CVPIA, plans and programs designed to achieve those goals and objectives have been developed and are being implemented. Many hundreds of individual actions and measures have been accomplished in fulfillment of those plans and programs and work aggressively continues. FY 2003 was no exception. As described above, more of this monumental task has been undertaken and progress is being continually reported.

With this success, there are also problems to be addressed and overcome. Limited and fluctuating budgets make it difficult to meet the immediate needs or to sustain efforts without large infusions of funds from other parties. The AFSP, for example, has a current backlog of active projects that require approximately $31.9 million of additional program funds to complete. The FY 2004 budget provides only $3 million. Similarly, the Water Acquisition Program is significantly underfunded. At current prices, the provision of Level 4 supplies to refuges (159,000 af) would require a budget of more than $19 million yet the FY 2004 budget for refuge water acquisition provides less than half of that amount. The 12-year commitment to the San Joaquin River Agreement to provide pulse flows in the lower San Joaquin River and attraction flows in certain San Joaquin River tributaries will cost roughly $6.9 to $9.7 million (depending on the hydrologic year type) and could account for as much as 67 percent of the total FY 2004 Water Acquisition Program budget of $12.6 million. There will be very little available for acquiring water for instream flows on any other Central Valley streams for the duration of the current agreement, currently scheduled to expire after FY 2011. Other essential CVPIA programs, most notably the AFRP and the CAMP, are also underfunded to the point that progress in those areas will be slowed significantly.

Although Interior is rightfully proud of its efforts to date, we fully recognize that the job is far from being done. We cannot at this time predict when, or even if, we will fulfill all of the goals and objectives in the CVPIA. Factors beyond our control exert a very great influence over the success of the efforts we make. However, we believe we are on the right course and intend to continue at least with the same level of effort and will encourage our partners in this venture to do the same.