

**CALFED Ecosystem Restoration Program
Funded Proposals for 2001
December 2000**

Copies of full proposals and associated reviews are available on the CALFED website at http://calfed.ca.gov/ecosystem_rest.html.

Projects Funded from Proposition 204

2001-A205 The Influence of Flood Regimes, Vegetative and Geomorphic Structures on the Links between Aquatic & Terrestrial Systems

Applicant: Center for Integrated Watershed Science and Management

Cost: \$2,521,236

Location: Cosumnes Watershed

It is estimated that less than 5% of the Central Valley's original riparian forest remain intact, and floodplain wetlands have been similarly impacted by channel modification, agriculture and urbanization. The only cost-effective method for large-scale restoration of floodplain communities is structural modification, such as levee breaches or levee setbacks, followed by natural succession of flood dependent biotas. This study will use a unified sampling design to examine conditions under which ecological succession is effective in restoring the structure and food-web dynamics characteristic of functioning native ecosystems in floodplain areas newly subjected to flooding.

2001-A207 Real-Time Flow Monitoring

Applicant: Department of Water Resources

Cost: \$418,700

Location: 5 Eastside Sacramento River Tributaries

Base flows that are within the range of the minimum flow range of the natural hydrograph are essential to the restoration and future survival of at-risk fish species. This project is a continuation of operation and maintenance of flow monitoring stations that are part of an effort to assess, and manage minimum base instream flows in five Sacramento River tributaries. Each of the five tributaries (Antelope, Mill, Deer, Big Chico, and Butte creeks) support at-risk species and each has significantly impaired flows that have been detrimental to the survival of the at-risk species.

2001-B201 Tuolumne River Restoration: Special Run Pool 10

Applicant: Turlock Irrigation District

Cost: \$543,530

Location: Lower Tuolumne River

The Tuolumne River supports a population of fall-run chinook salmon that has fluctuated from a high of 40,000 fish in 1985, to a low of 100 fish in 1991 and 7,900 fish in 1999. One of the many limiting factors on salmon populations are the aggregate extraction pits, which are a byproduct of extensive in-stream mining, which have the potential of fostering large populations of non-native predator fish such as large-mouth bass. This project's objectives are to improve salmon spawning and rearing habitats by filling the in-channel mining pits; preventing

future connections between the River and the off-channel mining pit; restoring native riparian habitats; and allowing the river channel to migrate within the restored floodway. Partial funding is recommended for permitting, planning and easement-related activities and coordination is recommended with the CVPIA Anadromous Fish Restoration Program Adaptive Management Forum for Large Scale Restoration Projects.

2001-B202 Survey and Eradication of *Arundo donax*

Applicant: California State University, Chico

Cost: \$360,000

Location: Upper Sacramento River Tributaries

Arundo donax (giant reed or giant cane) is a non-native invasive species that threatens native riparian habitat and stream ecosystems throughout California. The primary objective of this project is to identify areas infested by *Arundo donax*, to implement an outreach and education program for landowners whose riparian habitats are affected by *Arundo donax*, and to assist them in its eradication. The project will then evaluate the effectiveness of human assisted revegetation compared to natural revegetation. Partial funding is recommended to do this work on one or two sites identified in the proposal as a demonstration project.

2001-B203 Invasive *Spartina* Project

Applicant: California Coastal Conservancy

Cost: \$1,793,661

Location: San Francisco Bay and Estuary

Spartina alterniflora is a non-native invasive species of cordgrass that has spread to an estimated 1,000 acres in the intertidal zone of San Francisco Bay since the mid-1970s. This invasive plant has the potential to convert much of the open tidal flat habitats of the Bay into stands of cordgrass meadows, and will also hybridize with the native *Spartina foliosa*, causing its local extinction. This project will undertake an expanded effort to plan and implement control of the invasive *Spartina* to prevent invasion of San Pablo and Suisun Bays, contribute to the overall scientific understanding of how the process of invasion can potentially lead to extinction of native species, and build a Bay-wide infrastructure to detect and prevent future invasive species establishment in the intertidal zone. Funding is not recommended for database or website development.

2001-C200 Merced River Salmon Habitat Enhancement: Robinson Ranch Site – Revised Phase II

Applicant: California Department of Fish and Game

Cost: \$1,699,101

Location: Merced River

This project will include a very complex suite of restoration actions to restore a reach of the Merced River that is degraded as a result of gravel mining activities and the aggregation downstream of dams, tailings and pits within the river. The improvement of channel dynamic/sediment transport will include: channel reconfiguration, creation of a large floodplain with native vegetation, and berm reconstruction. This should improve salmon spawning and rearing habitat through the creation of spawning riffles, runs, and pools and also result in water quality improvements. Review is recommended by the State Reclamation Board during the planning process and the project should coordinate with the CVPIA

Anadromous Fish Restoration Program Adaptive Management Forum for Large Scale Restoration Projects.

2001-C204 Sedimentation in the Delta and Suisun Bay

Applicant: U.S. Geological Survey

Cost: \$1,367,684

Location: Suisun Bay

The primary objectives of this study are to describe the movement of sediment in the Delta and describe the availability of sediment needed for habitat restoration. This project will yield basic data to improve our understanding of the flux of sediments into and through the Delta.

2001-C205 San Joaquin River National Wildlife Refuge Riparian Habitat Protection and Floodplain Restoration Project – Phase II

Applicant: U.S. Fish and Wildlife Service

Cost: \$7,646,233

Location: San Joaquin River, Los Banos area

The US Fish and Wildlife Service (USFWS) is proposing to initiate phase II of a project that will provide long-term preservation and protection, and the restoration of over 11,000 acres of fish and wildlife habitat on and adjacent to the San Joaquin River National Wildlife Refuge (NWR) of the San Luis NWR Complex. This project would fund the easement acquisition of approximately 400 acres of habitat adjacent to the refuge; restoration of 1,142 acres of riparian and wetlands habitat on refuge lands; a pilot re-introduction of riparian brush rabbits onto refuge lands; and biological monitoring and evaluation. Conditions for this proposal include 1) completion of flood management evaluation and resolution of issues; 2) creation and integration of a technical oversight committee; and 3) incorporation of information developed in project 2001-D202 (see below).

2001-C208 Tuolumne River Fine Sediment Management

Applicant: Turlock Irrigation District

Cost: \$910,486

Location: Tuolumne River, La Grange area

The objectives of this project are to; reduce the supply of fine sediment and sand from key tributaries to the mainstem spawning reach, reduce the volume of sand stored in the mainstem channel and therefore increase substrate permeability, and quantify the relationship between substrate permeability and chinook salmon survival-to-emergence. The approach for reducing the supply of fine sediment and sand to the mainstem includes implementing measures to reduce fine sediment delivery to the mainstem river from Gasburg Creek and evaluating sediment delivery from Lower Dominici Creek.

2001-D200 Cosumnes/Mokelumne Corridor Floodplain Acquisitions, Management, and Restoration Planning

Applicant: The Nature Conservancy

Cost: \$3,044,342

Location: Cosumnes River Preserve area

This project is Phase I of a two-part flood management and ecosystem restoration project. After location and acquisition of suitable parcels, this project will provide additional sites to implement floodplain restoration and test the theory that breaching levees can lower peak flood flows while also enabling floodplain restoration. Through reestablishment of natural floodplain processes this project proposes to protect and restore riparian, wetland, and aquatic habitats and their associated species, facilitate population expansion of species associated with the Cosumnes and Mokelumne Rivers, and protect the habitat values on existing farmland by purchasing conservation easements that promote wildlife friendly farming practices. This multi-purpose project can have extensive ecosystem benefits while providing flood damage reduction.

2001-D201 Habitat Acquisition for Riparian Brush Rabbit and Riparian Woodrat

Applicant: U.S. Fish and Wildlife Service

Cost: \$2,720,085

Location: Stanislaus River, Caswell Memorial State Park area

The riparian brush rabbit and the riparian woodrat are two of the most critically endangered species in the Central Valley of California. A captive breeding effort for the rabbit has been launched by Department of Interior agencies. Acquisition and restoration of riparian habitat is needed to provide secure sites for release of captive-bred rabbits in the future. This project will acquire fee title of or conservation easements on 400 acres of riparian habitat on the Stanislaus River near Caswell Memorial State Park. Land acquisition should be disclosed to and coordinated with the San Joaquin River Management Program and San Joaquin River Flood Management Association.

2001-D203 Yolo Bypass Management Strategy, Phase II

Applicant: Yolo Basin Foundation

Cost: \$210,000

Location: Lower Sacramento River, Yolo Basin

The project is Phase II of the Yolo Bypass Management Strategy project. Partial funding is recommended for Task 1 to continue working group meetings and Task 2 to evaluate potential economic impacts of changes in land use.

2001-E200 Phase II: Demonstration Project for the Protection and Enhancement of Delta In-Channel Islands

Applicant: Association of Bay Area Governments for the San Francisco Estuary Project

Cost: \$928,150

Location: San Joaquin River, Empire Tract area

Historical aerial photographs and empirical observation indicate that in-channel islands today are substantially reduced in numbers and area, impacting the availability of tidal wetlands for a wide variety of fish, wildlife and plant species. The objectives of this project are to; demonstrate that the erosion of in-channel islands can be slowed, stopped or reversed using biotechnical erosion control methods (barriers constructed with naturally occurring organic material), and demonstrate that biotechnical erosion control methods can be successfully installed with positive effects on important/priority fish, wildlife and plant species.

2001-E201 Hill Slough West Habitat Restoration Demonstration Project, Phase II

Applicant: California Department of Fish and Game

Cost: \$87,000

Location: Suisun Marsh

This phase of the project will complete the environmental documentation and permitting for a multi-phased project. The objective of the project when completed is the restoration of tidal action to approximately 200 acres of seasonal and permanent wetlands in the northeastern section of Suisun marsh. The restoration will benefit numerous at-risk species in the Suisun Marsh and can serve as a valuable demonstration project to evaluate restoration methods for other sites in Suisun Bay.

2001-E203 Fay Island Restoration Project – Phase I

Applicant: California Department of Fish and Game

Cost: \$744,148

Location: South-central Delta on Old River

This project will acquire and restore tidal action to an approximately 98 acre island reclaimed for agricultural and seasonally managed wetland, as well as acquire a 17 acre in-channel berm island adjacent to Fay island. Phase I involves the land acquisition and development of a habitat restoration plan.

2001-E204 Butte Creek/Sanborn Slough Bifurcation Upgrade Project

Applicant: California Waterfowl Association

Cost: \$1,000,000

Location: Butte Creek

Butte Creek supports the largest population of spring-run chinook salmon in the Central Valley and provides water for habitat used annually by millions of resident and migrating waterfowl and shorebirds. This is a continuation of a previously funded project which was designed to improve fish passage for anadromous fish in Butte Creek, a tributary to the Sacramento River, while maintaining the viability of agriculture and managed wetlands in the Butte Sink and surrounding area. The scope of this phase includes upgrading the high-flow

spillway, installing remote operation hardware and software and monitoring the structure for two hydrologic cycles to establish operational criteria for fish passage.

2001-E205 Suisun Marsh Property Acquisition and Habitat Restoration Project

Applicant: California Department of Water Resources

Cost: \$536,750

Location: Suisun Marsh

This project includes the initial phases of a multi-phase project to restore natural ecosystem processes to a degraded tidal marsh system. The objective of this project is to acquire a parcel in the western or northern Marsh that has been leveed off from tidal influence and is suitable for restoration. A self-sustaining functional marsh ecosystem will be developed through restoration of natural edaphic, topographic, and tidal features, which will aid in the recovery of listed and special status plant and animal species occurring in the Marsh and will improve water quality in the Sacramento-San Joaquin Delta.

2001-E211 Feasibility Study of the Ecosystem and Water Quality Benefits Associated with Restoration of Franks Tract, Big Break, and Lower Sherman Lake

Applicant: California Department of Water Resources

Cost: \$1,218,105

Location: West Delta

The study will evaluate the potential to create ecosystem, water quality/supply, recreational, and other benefits at Lower Sherman Lake, Big Break, and Franks Tract by modifying remnant levees to inhibit salt trapping and restoring tidal marsh habitat. Approaches involve restoring natural landforms and channels to restrict salt trapping and mixing while retaining tidal influence and recreational access to the flooded island interiors. The study will investigate how restoration of tidal marsh with dendritic channels and tidal flows, can increase habitat values for fish and wildlife, including protected species, and inhibit invasive plant species. This project will help develop the scientific basis for large-scale restoration of tidal habitats in the Delta.

2001-E212 Ecological Monitoring of Tolay Creek and Cullinan Ranch Tidal Wetlands Restoration Projects

Applicant: Ducks Unlimited, Inc.

Cost: \$593,931

Location: North San Francisco Bay

This project is the second phase of the previously funded Tolay Creek and Cullinan Ranch restoration projects. The Tolay Creek project is directed at improving water circulation and salt marsh development while the Cullinan Ranch project will restore a diked farmland parcel back to tidal salt marsh. Restoration of tidal wetlands in these North Bay projects will provide more saline emergent habitat for endangered species. The objective in this phase is to monitor the two projects through the transition from project construction to the development of tidal salt marsh in order to increase the understanding of how physical and biological processes work together in tidal wetland restoration.

2001-F200 Transport, Transformation, and Effects of Selenium and Carbon in the Delta of the Sacramento-San Joaquin Rivers: Implications for Ecosystem Restoration

Applicant: U.S. Geological Survey

Cost: \$2,600,000

Location: The Delta

The Sacramento-San Joaquin Delta provides ecological and economic benefits of great significance to the entire Bay-Delta ecosystem, but important processes in the Delta are poorly understood. Many CALFED restoration alternatives involve changing inflows from the San Joaquin River to the Delta and Bay, despite the impaired quality of San Joaquin River water. This is an integrated project in which the dynamics of Selenium are studied from a perspective that considers the carbon cycle in the Delta and incorporates use of a newly refined, hydrodynamic transport model for the Delta. This project was partially funded with a reduced scope of modeling.

2001-F202 Large Scale Pilot Demonstration of Passivation Technology for Restoration of Newton Copper Mine

Applicant: University of Nevada

Cost: \$60,000

Location: Jackson, CA

The objective of this proposal was to conduct an on-site full-scale pilot demonstration of passivation technology for remediation and restoration of an inactive acid-generating copper mine. The passivation process uses innocuous, fixative chemicals to form a stable coating on the reactive and acid-generating materials. Partial funding was recommended to conduct only the laboratory portion of the study. The expected outcome of this investigation will establish guidelines for remediation in other abandoned and inactive mine sites in the state of California.

2001-F212 Rainbow Trout Toxicity Monitoring: An Evaluation of the Role of Contaminants on Anadromous Salmonids

Applicant: Central Valley Regional Water Quality Control Board

Cost: \$530,000

Location: Sacramento Watershed

Several stocks of chinook salmon and steelhead have been identified as threatened or endangered. Many factors have contributed to this decline, including water quality degradation. A recent study using rainbow trout embryos as the test species, found toxicity in four creeks dominated by urban storm runoff and wastewater treatment plant effluent. These recent toxicity results suggest direct effects of contaminants on salmonids are possible and need to be evaluated. This project will evaluate the rainbow trout embryo development test protocol with a suite of reference toxicants including cationic metals and pesticides that are identified as contaminants of concern in the Sacramento and San Joaquin River watersheds. The list of sampling locations should be revised to better reflect anadromous fish distribution and spawning areas.

2001-G202 Staten Island Acquisition

Applicant: The Nature Conservancy

Cost: \$35,110,873

Location: Northern San Joaquin County, Mokelumne River area

The Nature Conservancy proposes to acquire the 9,200 acre Staten Island. Acquiring the island will allow a contiguous corridor, containing a mosaic of habitats, reaching from Stone Lakes and the Valensin Ranch portion of the Cosumnes River Project to the north all the way to the Mokelumne Forks confluence. Initial management activities will include start up stewardship and planning, including development of a long-term plan for the island.

2001-G203 Battle Creek Riparian Protection

Applicant: The Nature Conservancy

Cost: \$1,000,000

Location: Battle Creek Watershed, No. Sacramento Valley

This project expands the efforts of the Battle Creek Salmon and Steelhead Restoration Program through the acquisition of conservation easements on 3 critical riparian properties on the North and South Forks of Battle Creek. The project will focus on protecting riparian habitat for at-risk native species and providing broad ecosystem benefits.

2001-G207 Sustaining Agriculture and Wildlife Beyond the Riparian Corridor

Applicant: Yolo County Resource Conservation District

Cost: \$1,464,167

Location: Yolo County

This project is a continuation of the Willow Slough Watershed, Union School Slough Watershed Improvement Program project. This phase is being implemented by the Yolo County Resource Conservation District (RCD) with the intent of addressing the following objectives: to use Union School Slough to develop a set of scientifically viable watershed assessment protocols; to confirm the viability of watershed improvement recommendations (for water quality and wildlife) through more in-depth scientific analysis of existing remedial practices and demonstrations; and to increase landowner awareness and participation in implementing watershed restoration. This project complements 2001-H211.

2001-H200 Lassen National Forest Watershed Stewardship Within the Anadromous Watersheds of Butte, Deer, and Mill Creeks

Applicant: U.S. Forest Service

Cost: \$849,845

Location: Lassen National Forest

The watersheds of Deer, Mill and Antelope Creeks support most of the few remaining naturally reproducing stocks of anadromous fish in the Sacramento Valley. A watershed analysis performed in the first phase of this project, determined that surface erosion and near stream disturbance were significantly higher than their historical condition. The analysis further determined that roads were a primary source of the problems. The second phase

of this project will continue the restoration of three watersheds through implementation of extensive sediment reduction projects in Deer and Mill Creeks, meadow surveys and restoration demonstration projects, installation of interpretive displays at seven recreation areas, campground education programs, and the establishment of Watershed Stewardship education programs at Chester Elementary and High Schools.

2001-H203 Sonoma Creek Watershed Conservancy

Applicant: Southern Sonoma County Resource Conservation District

Cost: \$545,170

Location: Sonoma Creek Watershed

Sonoma Creek's watershed has no dams, supports a diverse native fish community, and has a high level of public awareness to support restoration. This project addresses the watershed's needs for assessment, planning, education and restoration actions. This will be accomplished through the following tasks: monitor a CALFED funded fish passage solution; monitor CALFED funded pool enhancements; remove a steelhead barrier and restore passage; design a solution where a road bed is eroding into a spawning area; provide technical assistance and monitoring for other small restoration projects; and other outreach and monitoring activities.

2001-H207 Sacramento River Conservation Area Program

Applicant: California State University, Chico Research Foundation

Cost: \$326,991

Location: Upper Sacramento River Watershed

The main stem of the Sacramento River historically supported a complex ecosystem that provided habitat for a variety of fish and wildlife, including several species now threatened or endangered. Extensive development within the floodplain of the river, its headwaters and tributaries has negatively impacted the habitat and the fish and wildlife dependent on that habitat. In 1986, the Upper Sacramento River Fisheries and Riparian Habitat Management Plan was created and subsequently developed. Many of the recommended fisheries actions have been or are currently being implemented. This project involves the hiring of a manager and office staff for a three year period to assist in the development and implementation of site specific plans for areas within the Sacramento River Riparian Conservation Area and to manage a new non-profit riparian area management entity.

2001-H208 Kirker Creek Watershed Coordinated Resource Management Planning(CRMP) Program

Applicant: Contra Costa Resource Conservation District

Cost: \$198,450

Location: Northeastern Contra Costa County

The goal of the Kirker Creek Watershed CRMP Program is to facilitate, coordinate, and support the efforts of landowners, municipalities, community organizations, industry, and citizens of the Kirker Creek Watershed and to develop and write a watershed management plan using the CRMP process. The plan will address watershed-wide natural resource problems including restoration of wetland and riparian communities, prevention of soil erosion, reduction of non-point source pollution, reduction of flooding, and the preservation of property rights by engaging local landowners and other watershed stakeholders.

2001-H209 Digital Soil Survey Mapping and Digital Orthophotoquad Imagery Development for the Bay-Delta Region

Applicant: Natural Resources Conservation Service

Cost: \$502,100

Location: Numerous Counties

Soils data is currently underutilized by groups and organizations engaged in planning and implementing ecosystem restoration projects. This project will rectify and digitize county-based soil maps focussing on Glenn County, Tehama County, Madera, Merced and East Stanislaus areas.

2001-H211 Willow Slough Watershed Rangeland Stewardship Program

Applicant: National Audubon Society-California

Cost: \$1,800,668

Location: Yolo County

The project will develop an expanded watershed stewardship program to enhance and restore riparian and grassland habitats, improve forage quality, improve water quality and reduce erosion. This will be done by building on existing relationships with ranchers developed through the implementation of recommendations in the Willow Slough Integrated Resources Management Plan.

2001-H212 Marsh Creek Watershed Stewardship Program: A project to protect water quality in the Western Delta

Applicant: The Natural Heritage Institute

Cost: \$126,000

Location: Western Delta, Mt. Diablo area

A citizen-based Watershed Science Program was started in Marsh Creek with funding from the Coastal Conservancy. Partial funding for this project will continue the Watershed Science Program for baseline data acquisition and public education.

2001-I201 Watershed Education, Headwaters to the Ocean

Applicant: Sacramento River Discovery Center

Cost: \$321,816

Location: Sacramento County

This project will continue to build a model that educates citizens to better understand, appreciate, and manage natural systems. Partial funding will provide support for expansion of previously funded projects, all components of a very successful high school/college intern program. Task 4, mapping, and Task 5, development of two videos, were not recommended for funding.

2001-I202 Estuary Action Challenge Environmental Education Project

Applicant: Earth Island Institute

Cost: \$50,000

Location: San Francisco Bay Estuary

Estuary Action Challenge (EAC) is the environmental education project of Earth Island Institute, focusing on the San Francisco Bay Estuary. EAC works with elementary school teachers and students to explore, clean-up and restore creek and bay habitats, reduce urban runoff pollution and address issues of water quality and safe bay food consumption. These funds will assist EAC in continuing their educational program.

2001-I204 Watershed Education Project

Applicant: Chico Unified School District

Cost: \$100,865

Location: Butte County

The project will continue the successful efforts of the current program, expand coordinator functions to other school districts, provide continued training in appropriate curriculum and field study protocols, continue and expand restoration activities and enhance linkages with watershed education efforts in the region.

2001-I205 Traveling Film Festival and Exhibition/San Joaquin River Oral History Film

Applicant: Independent Documentary Group

Cost: \$216,550

Location: Sacramento-San Joaquin Counties

This project is a continuation of the Traveling Film Festival and Exhibition through the booking of additional screenings in the Bay Area and further east into the Central Valley. The second part of the project is the production of a short film for television entitled the San Joaquin River Oral History Film, which captures the stories and images of those who lived and worked along the river before the Friant Dam was constructed. Applicants must ensure coordination with San Joaquin Valley-based groups.

2001-I207 Environmental Stewardship Education Conferences and Tours: Addressing the Impacts of Farm and Landscape Management Decisions on Bay-Delta Ecozones

Applicant: Committee for Sustainable Agriculture

Cost: \$48,500

Location: Fresno, Madera and Stanislaus Counties

Partial funding is for two conservation conferences and tours in the San Joaquin Valley that will present conservation practices that mitigate production decisions and thereby reduce water pollution and soil erosion from agriculture and landscape operations.

2001-I208 Delta Studies Program: San Joaquin County Schools

Applicant: San Joaquin County Office of Education

Cost: \$306,291

Location: San Joaquin County

Funding will go towards the creation of a Delta studies curriculum, Delta education resources center and a cadre of teachers trained in the Delta studies curriculum. This will assist the county in having students meet the California Academic Standards through classroom lessons focused on the aquatic and terrestrial habitats and ecological functions of the Delta.

2001-I209 Adopt-A-Watershed Leadership Institute

Applicant: Adopt-A-Watershed

Cost: \$592,884

Location: Numerous Counties

Adopt-A-Watershed is a community-school collaboration with a K-12 science curriculum that brings together schools and local stakeholders to help students and the community develop scientific literacy, environmental stewardship, and a service ethic. Education is the cornerstone of a healthy watershed. The key is to get more teachers involved and give them support, structure, and training for success. These funds will send 10 new leadership teams each year for 3 years (30 teams) to the Adopt-A-Watershed leadership Institute.

2001-I210 Discover the Flyway

Applicant: Yolo Basin Foundation

Cost: \$197,987

Location: Yolo County

The Discover the Flyway program takes an ecosystem approach to educating teachers, students, and the general public about wetland ecosystems and habitats primarily in the Yolo Basin Ecological Management Zone. The goal of this next phase of Discover the Flyway is to provide new teacher training opportunities and program expansion to reach a larger community audience.

2001-I211 Bay-Delta Learning Initiative

Applicant: Water Education Foundation

Cost: \$126,668

Location: State-wide

This project will educate boaters and anglers on the prevention of introduction and spread of non-native invasive species, brief journalists on the Delta in whole and the status and progress of CALFED, and provide curriculum materials to K-12 teachers in under-served communities.

2001-I213 Educating Farmers and Landowners in Biological Resource Management

Applicant: Community Alliance with Family Farmers

Cost: \$1,066,593

Location: Solano County

Community Alliance with Family Farmers proposes to continue the education of farmers and landowners about issues facing the regional ecosystem. This project will continue the farmer to farmer outreach, education and technical assistance that has resulted in reduced pesticide and fertilizer use. It will also provide farmers and landowners technical expertise including a full array of biological and watershed management practices which will reduce agricultural inputs into the waterways and will present practical techniques for restoring habitat.

2001-J200 Genetic Identification of Management Units for Watershed-Dependent Species of Special Concern

Applicant: California State University, San Francisco

Cost: \$851,669

Location: Central Valley

Land-use decisions involving watersheds often require trade-offs with respect to which areas to conserve, develop, or restore. When threatened species are involved, setting priorities can become very complex. The project will use molecular genetic information in order to better identify and prioritize populations and watersheds for conservation and management.

2001-K209 Estimating the abundance of Sacramento River Juvenile Winter Chinook Salmon with Comparisons to Adult Escapement

Applicant: U.S. Fish and Wildlife Service

Cost: \$1,081,638

Location: Red Bluff, California

The primary objective of this project is to obtain juvenile production indices and to correlate these indices with estimated escapement from adult counts at Red Bluff Diversion Dam and the winter-run carcass survey.

2001-K213 Battle Creek Anadromous Salmonid Monitoring Projects

Applicant: U.S. Fish and Wildlife Service

Cost: \$1,576,152

Location: Battle Creek

Three proposed Battle Creek salmonid monitoring projects will provide monitoring information for use in adaptive management of the Battle Creek Salmon and Steelhead Restoration Program. The three projects are: 1) adult fish counting and trapping at the Coleman barrier weir; 2) adult, redd, and carcass surveys, and 3) juvenile fish monitoring with two rotary screw traps.

2001-K214 Sacramento River Winter Chinook Salmon Carcass Survey

Applicant: U.S. Fish and Wildlife Service

Cost: \$305,273

Location: Shasta County

This project is a monitoring program designed to estimate the abundance of adult endangered winter-run chinook salmon with greater accuracy than estimates generated through the Red Bluff Diversion Dam fish ladder counts. It will also collect baseline information on several important life history attributes of winter-run chinook salmon, evaluate the effectiveness of the winter-run chinook salmon propagation program, and collect tissue for genetic analysis to characterize the winter-run chinook salmon population.

2001-K215 Clear Creek Juvenile Salmonid Monitoring Project

Applicant: U.S. Fish and Wildlife Service

Cost: \$871,026

Location: Shasta County

The project will monitor juvenile salmonid outmigration and condition. This will provide managers with information for assessing the effectiveness of restoration activities funded through the Central Valley Project Improvement Act, and to provide managers with a direct means to apply adaptive management to the restoration planning and implementation process. Fish abundance, size, and physical condition information will be coupled with environmental data such as season, flow, temperature, and climate to evaluate empirical relationships between habitat and fish abundance, and how these relate to restoration activities within the Clear Creek basin.

2001-K217 Juvenile Salmon Migratory Behavior Study in North, Central and South Delta

Applicant: Natural Resource Scientists, Inc.

Cost: \$210,000

Location: Sacramento-San Joaquin Delta

This study will improve the understanding of juvenile anadromous salmonid migratory behavior in the Delta that would significantly enhance ongoing and future Delta ecosystem restoration efforts as well as define the most appropriate water conveyance options. Information generated from this investigation will help determine if salmon outmigration is influenced more by the net movement of flow toward the south Delta pumps or by tidally-induced flows and identify important parameters affecting juvenile salmon migration.

2001-K218 Butte Creek, Big Chico Creek, and Sutter Bypass Chinook Salmon and Steelhead Evaluation

Applicant: California Department of Fish and Game

Cost: \$280,951

Location: Butte and Sutter Counties

The objective of this project is to gain more knowledge in the life history and relative abundance of spring-run chinook salmon, adult steelhead and fall-run chinook salmon migration timing and relative abundance, and rearing patterns for juvenile spring-run chinook salmon. Partial funding is recommended for Tasks 1, 2 and 3 which are an adult escapement survey, juvenile monitoring and coded-wire tagging program, respectively.

2001-K221 Food Resources for Zooplankton in the Sacramento-San Joaquin River Delta

Applicant: University of California, Davis

Cost: \$576,422

Location: Sacramento-San Joaquin River Delta

The project will assess the quantity and quality of food resources for copepods in various habitats of the Sacramento-San Joaquin River Delta. The project is designed to assess the nutritional requirements of Delta copepods, which habitats meet these requirements, and how Delta food quantity and quality for copepods have changed over time. The project will also evaluate the species-and habitat-specific nutritional value of copepods for fish production. It will characterize and quantify energy transfer pathways and efficiencies from producers via copepods to fish. These ecosystem functions are central to success and failure of restoration projects as well as to an increased understanding of biotic contaminant transfers.

2001-L200 City of Sacramento Intake Fish Screen Replacement Project

Applicant: City of Sacramento

Cost: \$6,020,995

Location: Sacramento River, American River

The project will replace the fish screens on municipal water supply intakes on the Sacramento River and the American River. Screening in this area is a high priority due to the potential benefits for numerous sensitive fish species.

2001-L203 White Mallard Dam and Associated Diversions

Applicant: California Waterfowl Association

Cost: \$84,938

Location: Butte Creek

The project will complete engineering design, permitting, and bidder's assistance for fish passage improvements to the White Mallard Dam and associated diversions. The object is to improve fish passage for anadromous fish in Butte Creek while maintaining the viability of agriculture and managed wetlands in the Butte Sink and surrounding area.

2001-L205 Lower Butte Creek Project: Phase III Facilitation/Coordination and Construction of Three Fish Passage Modification to Sutter Bypass West Side Water Control Structures

Applicant: Ducks Unlimited, Inc.

Cost: \$4,783,719

Location: Lower Butte Creek

The project implements the construction of fish ladders and fish screens on three major water control structures located on lower Butte Creek. The objective of the project is to increase self-sustaining populations of spring-run and winter-run chinook salmon, steelhead and splittail by significantly improving accessibility to the natal holding and spawning areas in Butte Creek by eliminating barriers.

2001-L206 RD 2035 Sacramento River Pump Intake Positive Barrier Fish Screen – Design and Environmental Review

Applicant: Reclamation District 2035

Cost: \$1,820,000

Location: Sacramento County

RD 2035 pumps water from the Sacramento River through a 400 cubic foot per second pump station for agricultural irrigation. Currently the pump intakes are unscreened, and have entrained juvenile chinook salmon, steelhead trout and other fish. The objective of this project is to prevent the entrainment of fish in the pumped diversion. This project includes preparation of design drawings to 30, 90, and 100 percent design; preparation of technical specifications; environmental analysis as required by NEPA/CEQA; acquisition of necessary construction permits and approvals.

2001-L207 Patterson Irrigation District Positive Barrier Fish Screen on San Joaquin River Diversion

Applicant: Patterson Irrigation District

Cost: \$175,000

Location: Patterson, California

The project is a feasibility study to implement design, construction and completion of a positive barrier fish screen on the district's San Joaquin River Pumping Plant. The feasibility study will look at various ways of eliminating the impacts on the San Joaquin River chinook salmon species.

2001-L208 Lower Mokelumne River Restoration Program – Phase II

Applicant: Woodbridge Irrigation District and City of Lodi

Cost: \$680,000

Location: San Joaquin County

The primary objective of this phase of the project is to reduce or eliminate the entrainment of anadromous fish in water diversions through improved fish screening.

2001-L210 Fish Passage Improvement Project at the Red Bluff Diversion Dam

Applicant: Tehama-Colusa Canal Authority

Cost: \$1,574,000

Location: Tehama County

The objectives of this full implementation project are to reduce or minimize the impacts of the Red Bluff Diversion Dam on upstream and downstream migration of juvenile and adult anadromous fish, while improving the reliability of agricultural water supply. This is the second phase of the multi-phased project and is expected to produce the preliminary design of the project facilities and a NEPA/CEQA document.

2001-L212 Stockton East Water District and Calaveras County Water District Fish Screen Facilities – Calaveras River

Applicant: Stockton East Water District and Calaveras County Water District

Cost: \$670,000

Location: Calaveras River

The overall project is a full-scale restoration action implementation project involving new fish screens. Twenty-nine unscreened diversions exist between Bellota and New Hogan Dam on the Calaveras River. This project is Phase I of an anticipated IV phase project and will result in a series of technical memoranda on the various fish screening alternatives, order-of-magnitude cost estimates, and a preliminary list of the permitting and environmental requirements and constraints. Project designs should be reviewed by the CVPIA Anadromous Fish Screen Program and a monitoring plan should be added.

2001-L213 American Basin Fish Screen and Habitat Improvement Project

Applicant: Natomas Mutual Water Company

Cost: \$950,000

Location: Sacramento River

This project will perform the final design, complete the environmental documents, and obtain the necessary permits and licenses. This will involve the removal of a diversion dam, the consolidation of diversions, and the addition of state-of-the-art fish screens to Natomas Mutual Water Company’s diversions on the Sacramento River, between Verona and the American River, and on the Cross Canal.

2001-L201 Sacramento River Small Fish Screen Project Vertical River Pump Diversions

Applicant: Natural Resources Conservation Service

Cost: \$1,800,000

Location: Sacramento River

The goal of this cooperative ongoing project is to screen diversions on the Sacramento River, reduce entrainment and advance screen technology by demonstrating the highly useful retrievable feature in screen design. Funding is recommended for three years.

Projects funded by the Central Valley Project Improvement Act

2001-A206 Narrows 2 Hydro Power Plant Flow Bypass System Design

Applicant: Yuba County Water Agency

Cost: \$299,606

Location: Yuba County

The Yuba River supports significant naturally-spawning populations of anadromous fish. Under existing conditions, anadromous fish in the lower Yuba River can be adversely affected by normal maintenance, emergency operations, and catastrophic failure of the Narrows 2 powerplant or Pacific Gas & Electric transmission system. Phase I of the project developed a preliminary design study for supplementing the flow bypass facilities at the Narrows 2 powerplant. This phase will use that as the basis for the final design work. Budget review is recommended.

2001-C207 Spawning Habitat and Floodplain Restoration in the Stanislaus River, Phase I

Applicant: Carl Mesick Consultants and Trust for Public Lands

Cost: \$672,610

Location: Lower Stanislaus River

This project is Phase I of a spawning and floodplain restoration project on the lower Stanislaus River. The objectives of the project are to increase coarse sediment storage and supply and restore floodplain function and habitat in the Stanislaus River by applying a newly emerging approach that has been successfully used elsewhere. The approach is to remove gravel on heavily disturbed bars in a way that restores floodplain habitat, and insert that gravel back into the river to increase gravel storage and supply. Partial funding is recommended for the Two-mile Bar portion of the proposal.

2001-C209 Tuolumne River Mining Reach Restoration Project No. 3- Warner-Deardorff Segment

Applicant: Turlock Irrigation District

Cost: \$910,486

Location: Lower Tuolumne River

The Mining Reach project will return a 6.1 mile reach of river to a more natural, dynamic channel morphology that will improve, restore and protect instream aquatic habitat and shaded riverine aquatic habitat for San Joaquin fall-run chinook salmon productivity and will help restore natural hydrological and geomorphic processes. This project is phase three of the four phased project.

2001-D202 Non-Structural Alternative at the San Joaquin River National Wildlife Refuge: Refinement for Habitat Enhancement

Applicant: Ducks Unlimited, Inc.

Cost: \$231,942

Location: San Joaquin River, Los Banos area

As a result of the January 1997 floods, the USFWS is working with the US Army Corps of Engineers to plan a non-structural flood management alternative (NSA). This project is a part of Phase II of the NSA and is a

demonstration channel-floodplain reconstruction project. This project will specifically allow the reconnection of the mainstem San Joaquin River with floodplain lands at the Refuge near the confluence of the Tuolumne River through levee modification. The objectives of the project are to improve rearing conditions for juvenile salmonids, minimize the potential for stranding of these fish species, and enhance San Joaquin River foodweb productivity.

2001-H202 Tuolumne River Watershed Outreach and Stewardship

Applicant: Tuolumne River Preservation Trust

Cost: \$62,000

Location: Tuolumne River Watershed, Stanislaus County

This project will facilitate the implementation of the Tuolumne River Restoration Plan through the creation of outreach materials and the distribution of these materials to landowners and the general public. This effort will build awareness, understanding and support for the Tuolumne River Restoration Plan and will foster greater local watershed stewardship.

2001-H205 Battle Creek Watershed Stewardship Phase 2

Applicant: Battle Creek Watershed Conservancy

Cost: \$268,817

Location: Battle Creek

Phase I of the project completed a Battle Creek Watershed Strategy and initiated certain projects. Phase II will continue to implement projects within the Strategy and also an assessment of watershed conditions, and implementation of a watershed information system.

2001-J201 Biological Assessment of Green Sturgeon in the Sacramento-San Joaquin Watershed

Applicant: University of California, Davis

Cost: \$641,362

Location: Bay-Delta

The green sturgeon is an anadromous, native fish that occurs in low numbers in the Bay-Delta system. It is classified as an at-risk species, but very little is known about its life history. The first two phases of this research project focused on the biological characteristics of the species and its habitats. Phase three will continue the work of the first two phases and include new studies to improve the information used in population models in order to assist decision makers in the recovery of green sturgeon.

2001-K203 Merced River Water Temperature Management Feasibility Study

Applicant: Merced Irrigation District

Cost: \$45,000

Location: Merced River

The Merced River is currently the southern-most Central Valley river inhabited by anadromous salmonids and is consequently subject to longer warm seasonal periods than more northerly streams. The primary objective of the

project is to develop and evaluate effective options for water temperature management in the Merced River to improve conditions for anadromous salmonids, principally during the fall and spring seasons. Partial funding is recommended as the first step in development of a comprehensive water temperature management plan for the lower Merced River.

2001-K204 Using Molecular Techniques to Preserve Genetic Integrity of Endangered Salmon in a Supplemental Program

Applicant: University of California, Davis

Cost: \$400,000

Location: Upper Sacramento River

The success of supplementation programs for endangered salmon species is dependent upon the maintenance of genetic variation and enhancement of effective population size. This project will identify winter-run chinook individuals prior to artificial propagation, develop new polymorphic molecular markers for use in winter-run pedigree and linkage disequilibrium analyses, genotype returning adult carcasses to obtain more precise size estimates, genotype outmigrating juveniles to refine run-size estimates, assist the naturally spawning population of winter run in Battle Creek and investigate the impact of the supplementation program on the naturally spawning winter-run chinook.

2001-K206 San Joaquin River Chinook Salmon Age Determinations: Phase II

Applicant: California Department of Fish and Game

Cost: \$54,555

Location: Merced, Stanislaus and San Joaquin Counties

This project will provide clarification of the age of chinook salmon that have returned to the rivers in the San Joaquin Basin to spawn. This will be done using scales that have already been collected from chinook salmon carcasses using a standard laboratory technique.

2001-K210 Health Monitoring of Hatchery and Natural Fall-run Chinook Juveniles

Applicant: U.S. Fish and Wildlife Service

Cost: \$40,890

Location: San Joaquin River System and Delta

This project will build on data collected in the year 2000 monitoring project and will characterize the health and physiological condition of both natural and hatchery juvenile chinook in the San Joaquin River System and Delta.

2001-K212 Evaluate the Use of a Two-dimensional Hydraulic and Habitat Simulation Model (River2D) to Assess Benefits of Channel Restoration

Applicant: U.S. Fish and Wildlife Service

Cost: \$11,000

Location: Merced River

The project will quantify features of fall-run chinook salmon spawning and rearing habitat, before and after restoration, of the Robinson restoration project on the Merced River. The primary objective is to evaluate whether the Robinson restoration project increases spawning habitat and rearing habitat. The tasks comprising this project include project management, field reconnaissance, hydraulic data collection, construction and calibration of hydraulic and habitat simulation models, and biological validation of the habitat simulation model.

2001-K219 Calaveras river Chinook Salmon and Steelhead Population Abundance and Limiting Factors Analysis

Applicant: Fishery Foundation of California

Cost: \$314,704

Location: Calaveras County

The goal of this project is to provide information that can be used in the preliminary development of a technically sound and implementable, consensus-based plan to restore self-sustaining populations of chinook salmon and steelhead to the Calaveras River. The project will aid the consensus-building process by providing scientifically defensible, quantitative information on the relationship between manageable physical factors and the dynamics of chinook salmon and steelhead populations.

2001-L204 Fish Treadmill Developed Fish Screen Criteria for Native Sacramento-San Joaquin Watershed Fishes

Applicant: University of California, Davis

Cost: \$1,362,878

Location: UC Davis

The project objective is to provide the data necessary to evaluate and improve aspects of fish protective facility design and operation at the State Water Project, Central Valley Project and other existing and proposed fish screen facilities. This is Phase II of the on-going study. A reduction in scope is recommended.