

Work Plan for Fiscal Year 2002

March 7, 2002

I Program Title Red Bluff (RBR) (Research Fish Passage Program) PIA Section

II Responsible Entities

	Agency	Staff Name	Role
Lead	USBR	Max J. Stodolski	Program Manager
		Sandy Borthwick	Support
Co-Lead	USFWS	Jim Smith, Ryan Olah	Biologist

III Program Objectives for FY 2002

The program objectives are listed below. The source documents for these objectives are noted and their relationship to the CALFED Program Ecosystem Restoration Program Implementation Plan. The program objectives have been cross-referenced against the actions the program will undertake in FY 2002 in Section VI below.

- A. Determine if the Red Bluff Research Pumping Plant (RBRPP) can be operated with minimal direct loss or harm to downstream migrating chinook salmon and other young anadromous and non-anadromous fish in the Upper Sacramento River (steelhead, sturgeon, striped bass, American shad).
- B. Determine if the RBRPP can be operated without creating new attraction for predators, and to minimize fish predation in and around structures associated with the RBRPP.
- C. Determine if the RBRPP can be operated with no harmful effects on upstream spawning migrations of four runs of chinook salmon, steelhead and other anadromous fish.
- D. Provide engineering assessments and modifications as needed to RBRPP to assure trouble free long-term operations and appropriate "fish-directed" hydraulic conditions at fish screens and in by-passes.
- E. Prepare final report for the Red Bluff Research Pumping Plant Evaluation Program.

IV Status of the Program

Specific Actions A-3, B-1, B-3 and C-1, which are the "in-river" biological evaluations associated with the Research Pumping Plant (RPP), were conducted by the Fish and Wildlife Service (USFWS). Descriptions of the Actions and the status of each action are as follows:

Abundance and Seasonal, Spatial and Diel Distribution Patterns of Juvenile Salmonids Passing the Red Bluff Diversion Dam Status: Draft final report completed.

Species, Relative Abundance, and Spatial and Temporal Distributions of Fish Predators Near the Red Bluff Diversion Complex, Including the Research Pumping Plant. Status: Draft final report completed.

Seasonal Movements of Sacramento Pikeminnow Near Red Bluff Research Pumping Plant Based Upon Radio Telemetry. Status: Data analysis completed.

Behavior and Movements of Migrating Adult Salmonids Near Red Bluff Research Pumping Plant Based Upon Radio-Telemetry. Status: Data analysis completed.

Field work for these Actions was completed in FY00. Draft final reports for A-3 and B-1 were completed this year. Draft final reports and the Final Reports for B-3 and C-1 will be completed in early FY02.

Specific Actions A-1, A-2, A-4, A-5, B-2, D-1 thru D-4, and E-1 are the "in-plant" biological and engineering evaluations associated with the RPP. They were conducted by United States Bureau of Reclamation (USBR). Descriptions of the Actions and the status of each action are as follows:

- ! A-1. Survival of Hatchery-Reared Juvenile Chinook Salmon Experimentally Passed Through Archimedes Lifts and an Internal Helical Pump at Red Bluff Research Pumping Plant. Status: Final report completed
- ! A-2. Fish Entrainment By Archimedes Lifts and an Internal Helical Pump at the Red Bluff Research Pumping Plant. Status: Final report completed
- ! A-4. Travel Time and Condition of Hatchery-Reared Juvenile Chinook Salmon Experimentally Passed Through Archimedes Lifts, an Internal Helical Pump, and Bypasses at Red Bluff Research Pumping Plant. Status: Final report completed
- ! A-5. Larval Fish Entrainment by Archimedes Lifts and an Internal Helical Pump at Red Bluff Research Pumping Plant. Status: Final report completed

- ! B-2. Plasma Cortisol Levels and Behavioral Stress Responses of Juvenile Chinook Salmon Passed Through Archimedes Lifts and an Internal Helical Pump at Red Bluff Research Pumping Plant. Status: Final Report Completed

- ! D-1. Incorporate Baffling Behind Fish Screens in Red Bluff Research Pumping Plant to Protect Juvenile Chinook Salmon From Impingement. Status: Project Completed
- ! D-2. Install Monitoring Devices on Various Components of Red Bluff Research Pumping Plant. Install a Water Jet Sluicing System at the Intake Bulkhead Gates to Remove Sand and Gravel Deposits. Status: Project Completed
- ! D-3. Measure Velocities Along Fish Screens and Incorporate Physical Changes to Reduce Harmful Hydraulic Conditions Along Fish Screens. Status: Project Completed
- ! D-4. Conduct Tests to Assess Effects of Debris Fouling and Sedimentation on Fish Screens and Other Components of the Fish Evaluation Facility. Status: Project

Completed

- ! E-1. Compile All Reports and Prepare a Synopsis Document Summarizing Results and Recommendations Resulting from the Red Bluff Research Pumping Plant Evaluation Program. Status: Has Not Been Started

Field work and data analyses have been completed for each of these Actions. Final reports have been completed for each of the biological evaluations. A Final Report addressing the engineering evaluations (D-1 thru D-4) will be completed in FY02.

After the USFWS and USBR complete all their final reports, a synopsis document will be written summarizing the results of the overall RPP biological and engineering program into one brief report. The Synopsis Report will be completed in FY02 and will mark the conclusion of a very challenging and successful program.

Fiscal year 2001 was to have been the final year for completing this program. Due to unfortunate staffing circumstances at the Northern Central Valley Fish & Wildlife Office the USFWS was unable to complete their reports. As a result of that, USBR was unable to compile all reports and complete the Synopsis Report as well. Therefore, it will be necessary to extend the Program into FY02. The FY02 funding requirements for the program are shown in the "Additional Funding Needs Tables" below.

V. FY 2001 Accomplishments.

Fiscal year accomplishments for Objectives A and B are as follows:

The USFWS completed two draft final reports during FY01. The Volume 5 draft report of The Pumping Plant Report Series” (Series) entitled “Estimating the abundance of Sacramento River juvenile winter chinook salmon with comparisons to adult escapement”, addresses the methods and some of the results of the juvenile salmonid monitoring study. This study was conducted from 1994 through 1999. The Volume 10 draft report of the Series entitled “Spatial and temporal distribution of Sacramento pikeminnow and striped bass at the Red Bluff Diversion Complex, including the Research Pumping Plant, Sacramento River, California, 1994-1998”, addresses distribution of predators in the vicinity of the RPP. Both reports have been reviewed by USBR staff and will be sent to the RPP Interagency Fisheries Work Group for review after addressing USBR’s comments. All data from the juvenile salmonid monitoring study and the two telemetry studies assessing adult chinook salmon and pikeminnow movement patterns were analyzed and draft final reports are being prepared.

USBR completed three final reports which have been distributed to interested parties. Volume 11 of the Series, entitled “Travel time and condition of juvenile chinook salmon passed through Archimedes lifts, an internal helical pump, and bypasses at Red Bluff Research Pumping Plant, Sacramento River, California”, addresses fish passage through the entire plant from the pump intakes to the bypass outfall in the river. Volume 12 of the Series, entitled “Larval fish entrainment by Archimedes lifts and an internal helical pump at Red Bluff Research Pumping Plant, upper Sacramento River, California”, addresses seasonal and diel patterns of larval fish entrainment as well as efficiencies of screens at excluding larval fish from the canals. Volume 13 of the Series, entitled “Fish entrainment by Archimedes lifts and an internal helical pump at the Red Bluff Research Pumping Plant, upper Sacramento River, California: February 1997 - May 2000”, addresses entrainment of juvenile and adult fish. The report includes assessments of seasonal and diel entrainment patterns, actual and estimated numbers of chinook salmon entrained, mortality and injury to entrained fish, and fraction of wild chinook salmon passing Red Bluff Diversion Dam that are entrained into the RPP. With the submission of these three reports, USBR has completed final reports for all the biological study objectives that they were responsible for addressing. All data from the engineering evaluations have been collected and analyzed. A final report is being written to complete the engineering study objectives.

Two reports completed in FY00 were condensed and submitted to peer-reviewed journals in FY01. Both were accepted for publication pending minor revisions. The paper titled *Plasma cortisol and behavioral responses of juvenile chinook salmon to passage through Archimedes lifts and a Hydrostal pump* was accepted for publication in the North American Journal of Fisheries Management. A second paper, titled *Passage of juvenile chinook salmon through Archimedes lifts and an internal helical pump at Red Bluff, California*, was accepted for publication in the Transactions of the American Fisheries Society. Both articles will likely be published in early FY02.

During FY01 USBR continued to monitor entrainment of adult and juvenile fish into the RPP during periods of operation when threatened or endangered fish (winter and spring-run chinook salmon, steelhead) were potentially present in the Sacramento River. The data has been compiled and summary reports were submitted to the National Marine Fisheries USFWS and other interested agencies. This monitoring is a condition of operation for water deliveries and is not considered part of the RPP research program.

VI. Tasks, Costs, Schedules and Deliverables.

A Narrative Explanation of Tasks.

- 1 Program Management. Both USBR and the USFWS will have management requirements to carry this Program to its conclusion. USBR is responsible for collecting, compiling, publishing and distributing all final reports and completing a Synopsis Report. USFWS is responsible for completing two more final draft reports and the subsequent Final Reports.
 - 1.1 USBR complete one Final Report and the Synopsis Report
 - 1.2 USFWS complete two Final Reports
- 2 Report Writing
 - 2.1 USBR completes all reports
 - 2.2 USFWS completes their reports

Note: Fiscal year 2001 was to have been the final year for completing this program. Due to the fact that all three of the Project Leaders of these tasks left their positions to seek opportunities in other USFWS Offices, the Northern Central Valley Fish & Wildlife Office of the USFWS was unable to complete their reports. As a result of that, USBR was unable to compile all reports and was unable to complete the Synopsis Report as well. Therefore, it will be necessary to extend the Program into fiscal year 2002. The FY02 funding requirements for the program are shown in the "Additional Funding Needs Tables" below

B. Schedule and Deliverables - Additional Funding Needs.

#	Task	Dates		Deliverable
		Start	Complete	
1	Program Management			
1.1	USBR	10/01/01	12/31/02	Complete Final Report and Synopsis Report. Distribute The Pumping Plant Report Series to participating Federal and State Agencies and to over 100 other interested parties.
1.2	USFWS	10/01/01	10/31/02	Deliver Final Reports to USBR.
2	Report Writing			
2.1	USBR	10/01/01	09/30/02	Report authors complete final Engineering Evaluation and the Synopsis Reports.
2.2	USFWS	10/01/01	09/30/02	Report authors complete pikeminnow and salmonid Telemetry Final Reports

Explanatory Notes:

C. Summary of Program Costs and Funding Sources - Additional Funding Needs

#	Task	Total Cost	Funding Sources	
			RF	W&RR
1.1	Program Mgmt -USBR	\$ 35,000	\$ 0	\$ 35,000
1.2	Program Mgmt - USFWS	\$ 4,500	\$ 0	\$ 4,500
2.1	Write Reports - USBR	\$ 179,500	\$ 0	\$ 179,500
2.2	Write Reports - USFWS	\$ 28,000	\$ 0	\$ 28,000
Total Program Budget		\$ 247,000	\$ 0	\$ 247,000

Explanatory Notes:

D. CVPIA Program Budget - Additional Funding Needs.

#	Task	FTE	Direct Salary and Benefits Costs	Contracts Costs	Miscellaneous Costs	Administrative Costs	Total Costs
1.1	Program Mgmt - USBR	0.35	\$ 21,000	\$ 0	\$ 2,000	\$ 12,000	\$ 35,000
1.2	Program Mgmt - USFWS	0.05	\$ 2,500	\$ 0	\$ 1,000	\$ 1,000	\$ 4,500
2.1	Write Reports - USBR	1.80	\$12,500	\$ 0	\$ 0	\$ 67,000	\$ 79,500
2.2	Write Reports - USFWS	0.40	\$ 20,600	\$ 0	\$ 0	\$ 7,400	\$ 28,000
	Total by	2.60	\$156,60	\$ 0	\$3,000	\$ 87,400	\$247,000

Explanatory Notes: Miscellaneous costs include report materials, binding, postage, etc.

E. Quarterly Obligation/Expenditures - Additional Funding Needs.

#	Task	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1.1	Program Mgmt -USBR	\$ 17,000	\$ 15,000	\$ 1,500	\$ 1,500
1.2	Program Mgmt - USFWS	\$ 2,000	\$ 1,000	\$ 800	\$ 700
2.1	Write Reports - USBR	\$ 100,000	\$ 50,000	\$ 19,500	\$ 10,000
2.2	Write Reports - USFWS	\$ 15,000	\$ 9,000	\$ 3,000	\$ 1,000
Total CVPIA Budget by Quarter		\$134,000	\$ 75,000	\$ 24,800	\$ 13,200

Explanatory Notes:

VII Future Years Commitments/Actions.

Operation and maintenance cost for other research projects and for pumping irrigation water will be funded through other programs. However, a nominal annual funding stream should be provided for this project to enable USBR to maintain the facilities dedicated to research only. The estimated amount is approximately \$15,000 annually.

This research program, to evaluate the efficacy of “fish friendly” pumps used for the purpose of pumping water containing juvenile fish. has been very successful and very beneficial to many fish species in the Central Valley of California. These types of pumps have been installed at a few locations and there are plans to install others. Also, there have been many inquiries through out the United States and Canada about their potential use at other locations.