

Title: Cosumnes River Salmonid Barrier Program

Watershed or geographic area: Cosumnes River

Watershed priority: no designation

Actions: The project will involve designing, contracting, and constructing: (1) Modifications to both fish ladders associated with the Granlees Diversion Dam so that they meet current CDFG hydraulic criteria for fish passage; (2) A flow barrier wall on the left bank of Granless dam to eliminate misdirecting attraction flows that occur at low to mid range flows; (3) Low flow fish passage structures (e.g., rock weirs or channels with flashboards) on three summer dam/low flow crossings that exist in the lower river. Also included is a three year post-project monitoring effort to evaluate the effectiveness of the new passage facilities in increasing access to spawning and rearing areas.

Location: All actions will occur along the mainstem of the Cosumnes River in Sacramento County. Granlees Diversion Dam is located in Rancho Murietta.

AFRP action priority: High

Objective: Improve access for adult salmonids to 7.2 miles of suitable spawning habitat upstream of Granlees Diversion Dam and connectivity between natal areas and rearing areas for juvenile salmonids in the mainstem of the Cosumnes River.

Description: The project will include the following tasks:

Task I - Baseline Monitoring/Bioassessment: The FFC, TNC, and STEP have undertaken initial baseline monitoring.

Task II Permitting and environmental documentation:

California Department of fish and Game has agreed to act as the CEQA lead agency. US Fish and Wildlife is being consulted for the NEPA lead agency. Various permitting will be contracted out to the appropriate consulting agency.

Task II - Engineering

Granlees Diversion Dam fish ladder improvement project and the summer dam/low flow crossing designs will be contracted out with instructions to attain the most beneficial end product with the requested funding. Engineering designs will be developed in consultation with CDFG and NMFS engineers familiar with salmonid passage. Three designs, one primary and two alternate, will be formulated with the intent that all involved parties will be able to review them and chose which design will most fully address the technical, biological, and functional needs. Final design will be chosen with a consensus of stakeholders based upon these criteria. Applications for required State and federal permits would be completed based on final engineering designs. This Task will occur from October 1998 - January 1999.

Task III - Let Bid Package:

Upon completion of the engineering designs, the construction bidding package will be completed and distributed in January 1999 to qualified contractors, with a contract awarded in March 1999.

Task IV - Construction:

Fish barrier improvements will be contracted out to the lowest bidder meeting bid package guidelines. Construction will begin July 1, 1999, with completion by October 15, 1999. Each individual project can stand alone in construction and design (see Budget costs for individual costs) and no two projects are inseparable but it is recommended that all projects be funded to receive the greatest benefit to the salmonid resource of the Cosumnes River.

Task V - Monitoring:

Monitoring consisting of spawning surveys, outmigrant monitoring, and rearing will begin in the Fall immediately following the award of funding, and continue through the end of the outmigration period (mid May). Monitoring will be done under the supervision of CDFG stream evaluation group who will record and analyze data for future reporting. Monitoring under this grant will be conducted during the years 1999 - 2002. It will continue beyond 2002 if additional funding can be acquired.

Background: The Cosumnes River, the last un-dammed river running from the eastern slopes of the Sierra Nevada into the Sacramento/San Joaquin Delta, supports a rich aquatic ecosystem. Of all of the Delta tributaries, it alone has escaped major water development and therefore has retained a relatively natural flow pattern and accompanying sediment and nutrient transport process. It is these qualities that make the Cosumnes a prime river for restoration and give it the potential to become a model for future river restoration efforts within the basin.

The Cosumnes River possesses a rain-dominated watershed with the majority of flow occurring as direct runoff. With little snowmelt to augment fall flows, the river between Highway 16 and Twin Cities Road often dries up or has flows unsuitable for upstream migration. The Cosumnes River historically supported thousands of fall-run Chinook salmon. This run has been diminished to only a few hundred spawning individuals because of habitat degradation, the loss of fall attraction flows, and barriers to migration.

The Cosumnes River possesses four potential migration barriers within or below the suitable spawning area. Three concrete summer dams/low flow crossings occur in the lower river, well below the spawning area. It has been concluded that these crossings are low flow barriers to upstream migration and act as a migration bottleneck in normal to low-flow years sometimes resulting in no salmon or steelhead spawning in the river. Rancho Murrieta Community Service District (RMCS D) operates a small diversion dam on the Cosumnes River. The dam has two fish ladders, which are functional during above average rainfall years. However, the ladders are both in excess of 70 years old and in a state of disrepair, possessing broken sections and significant filling of coarse sediment. An informal inspection by George Heise of CDFG in June of 1998 suggests the following deficiencies: 1) Excessive jump heights in all pools; 2) Inadequate dimensions in resting pools; 3) Substandard entrance pool for wide range of flows; 4) High risk

of salmon spilling back into the basin upon exiting the ladders due to poorly placed spillway; 5) Inadequate wall height increasing the risk of larger fish jumping out of resting pools; and, 6) Misleading attraction flows on opposite side of basin.

The proposed project will modify the existing fish ladders at Granlees Diversion Dam to bring them up to current CDFG hydraulic criteria for fish passage and significantly increase their durability so that they can withstand a wide range of hydrologic conditions. The summer dams will be retrofitted with low-flow passage structures to allow for fish passage over a greater range of flows. These actions will essentially eliminate barriers to fish passage on the Cosumnes River and mark the beginning of the recovery of sustained runs of fall-run Chinook in the watershed.

Justification: The Cosumnes River is an Eastside Delta tributary that supports fall-run chinook salmon. This run is currently at reduced levels compared to the 1967 - 1991 reference period used by the AFRP (USFWS 1995). Poor access to suitable spawning habitat has been identified as an important factor contributing to limited salmon production in the river. This project supports AFRP recommended actions designed to restore and increase available spawning habitat for salmonids. Both are considered high priority actions.

Monitoring needs: Monitoring will be conducted before and after the barriers are modified to determine spatial and temporal spawning distribution, flows and temperatures required for upstream migration, spawning success and the quality, quantity and distribution of spawning habitat. Monitoring will be conducted in cooperation with the CDFG Stream Evaluation Program (STEP) which is currently evaluating salmon population and habitat conditions within the Cosumnes River to identify management options that could improve habitat and increase salmon production. Monitoring will include habitat mapping and salmon spawning distribution using aerial photography, spawning distribution and spawner abundance using salmon carcass surveys, estimation of a salmon production index using downstream migrant traps, evaluation of salmon rearing habitat, and an evaluation of habitat conditions (flow, temperature, channel attributes, etc.).

The value of the monitoring data will extend beyond the boundaries of the fish passage project to various other present and future projects within the watershed. It is very possible with good supporting biological information that flood control projects near the spawning zone could be configured to improve salmon habitat.

Predicted biological benefits: The proposed project will directly and significantly benefit East side delta tributary fall run Chinook salmon and steelhead trout, both of which can be considered high risk species within the Cosumnes River. By eliminating barriers to upstream migration, the proposed project will grant these two priority species access to critical instream aquatic habitat higher in the watershed. The elimination of the low flow barriers created by the summer dam/ low flow crossings will grant salmon and steelhead access to upper watershed spawning grounds earlier in the year and under lower flows than has occurred in the past and will result in reduced straying, enhanced spawning readiness, run timing and juvenile outmigrant survival. The

projected benefit of the project will be long-term contributing to consistently increased run strength.

The project will provide multiple benefits to chinook salmon including a reduction in migration delays, reduced predation, enhanced spawning success, and will provide further habitat and population diversity to a depleted salmon resource, incrementally benefitting chinook salmon throughout the Sacramento-San Joaquin system. The aforementioned attributes will compliment The Nature Conservancy's work to create shallow water juvenile fish rearing habitat in the rivers lower floodplain.

The proposed improvements to fish passage at the existing barriers are consistent with the high priority ranking given to fish passage facilities in the AFRP Restoration Plan. The proposed project will significantly benefit steelhead, which has been listed as a threatened species under the Federal Endangered Species Act, and fall-run Chinook salmon which have been proposed for listing by NMFS. The proposed project is consistent with both CALFED priorities and objectives and with actions designed to promote recovery and protection for both salmon and steelhead populations.

Issues: The proposed project will involve heavy construction within the bankfull boundaries of the stream and will require normal county permitting and inspection process associated with improvements to property. All construction will be conducted during the summer base flow period during which most of the affected area of the Cosumnes River will be dry. This will allow construction to occur with a minimal effect on the aquatic resources of the Cosumnes River. A streambed alteration permit will be obtained from CDFG Region 2. Corps of Engineers approvals, Regional Water Quality Control Board water quality waiver or certification, and an historical waiver will be required. Endangered Species Act, clean water act, CEQA, and NEPA compliance will also be required. No significant environmental effects are expected to arise as a result of the proposed project. The permitting process will begin pending acquisition of funding.

Negotiations are in progress with the various land owners on the affected properties. RMCS D has pledged support for the proposed retrofit to the fish ladders on Granlees Dam and is awaiting board approval for an official agreement. Richard Becker, owner of the land adjacent to the second summer dam (RM 16.1) has pledged support to the project and has granted access to the site for construction purposes. The Nature Conservancy owns an easement on the property adjacent to the low flow crossing (RM 6.7) and will assist and is in the process of negotiating with the land owners for project approval. Recently, several deaths have occurred on the first summer dam (RM 23.0) stalling negotiations with the land owners. The Foundation will continue to actively solicit support from all involved parties until blanket approval has been obtained.

Involved parties: The Fishery Foundation of California.

Environmental documentation: see Task II above.

Deliverables: Project deliverables will include two annual progress reports and a final project report. Each report would be due at the end of each federal fiscal year. Electronic copies of all data collected in support of this project will be provided if requested.

Cost and Schedule:

a. Budget Costs

The Fishery Foundation of California is seeking \$188,255 of AFRP funding.

Project Phase and Task	Direct Labor Hrs.	Direct Salary and Benefits	Overhead Labor	Service Contracts	Material and Acquisition Contracts	Misc. And other Direct Costs	Total Cost
Task I Baseline Monitoring/ Bioassessment		10,000	-0-	10,000	8,600	250	28,850 No AFRP funding requested
Task II Permitting and environmental documentation		6,000	800	28,000	500	1,500	36,800
Task III Let Bid Package		2,000	300	-0-	-0-	500	2,800

Task IV						
Engineering and Construction						
a. fish ladders	8,131	813	105,346		15,802	130,092
b. summer dam #1	1,7943,120	179312	43,75438,900		6,5635,835	52,29048,167
c. Summer dam #2		34				27,535
d. Low Flow crossing	345		23,614		3,542	
Construction total	13,390	1,339	211,614		31,742	258,085
Task V	40,109	3,967	-0-	4,900	1,000	48,976
Monitoring						
Total Cost	71,499	5,306	249,614	14,000	34,992	357,511
						187,756
						sought from AFRP

In addition, the Fishery Foundation of California will provide in kind services to the proposed project. Hanson Environmental, Inc. will also provide professional consulting services, at no cost to the project, to assist with the project design and development, implementation of a monitoring and evaluation program, peer review of annual reports, and participation as a scientific advisor to the project.

b. Schedule Milestones

Task I:	Baseline Monitoring/Bioassessment	
Task II:	Permits Obtained	December 1998
Task III:	Engineering Design Completed Project Plans Complete Bidding Package Completed	January 1999 January 1999
Task III:	Let Bid Package/Contract Awarded	March 1999

Task IV:	Construction	July - October 1999
Task V:	Monitoring	1999 - 2002

Funding: AFRP \$187,756.

Status:

CVPIA implementation tools: 3406

DOI and other action coordinators:

Sources of information:

CDFG (California Department of Fish and Game). 1957. Annual spawning reports.

USFWS (U.S. Fish and Wildlife Service). 1995. Working paper on restoration needs, Volume 3. Washington, D.C., Department of Interior.