

DWR WAREHOUSE

07 JUL 28 PM 2:00
STANISLAUS RIVER SALMON HABITAT
RESTORATION ACTION,
Willms Site

REQUEST FOR FUNDING
From
1997 Category III

ECOSYSTEM RESTORATION PROJECTS AND PROGRAMS

Submitted By:

CALIFORNIA DEPARTMENT OF FISH AND GAME
Inland Fisheries Division

In Conjunction with

CALIFORNIA DEPARTMENT OF WATER RESOURCES
Four Pumps Program

Prepared by:

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Associate Fishery Biologist
California Department of Fish and Game
Inland Fisheries Division

I. EXECUTIVE SUMMARY

- a. **Project Title:** Stanislaus River Chinook Salmon Habitat Restoration Action, Willms Site.
Applicant: California Department of Fish and Game and the California Department of Water Resources

b. **Project Description and Primary Biological/Ecological Objectives:** The primary fishery objective of the proposed project is to remove salmon predator habitat by filling a broad (10.65 acres), relatively shallow (3-10 foot deep) instream pond, thereby improving survival for outmigrating smolts. Additional project benefits include improved salmon spawning and rearing habitat, improved river dynamics, enhanced floodplain and riparian vegetation habitat. The salmon habitat improvements will be accomplished by reconfiguring spawning beds and floodplain to better conform with the existing river flow regime.

Specific project biological/ecological objectives are:

- ◆ Eliminate juvenile salmon predator habitat by *filling the unnatural instream pond area;*
- ◆ Increase the quantity and quality of spawning habitat for chinook salmon by *adding spawning gravel, reconfiguring spawning beds and the river course thorough the filled pond;*
- ◆ Increase the quantity and quality of rearing habitat for chinook salmon by *increasing available in-channel diversity;*
- ◆ Improve river and floodplain dynamics by *reconfiguring the channel to better conform with the present flow regime;*
- ◆ Enhance riparian and seasonally inundated vegetation by *increasing and revegetating floodplain at the project site which will be captured by the river during high flows.*

c. **Approach/Tasks/Schedule:** The primary fishery objective of the proposed project is to remove salmon predator habitat by filling a broad (10.65 acres), relatively shallow (3-10 foot deep) instream pond, thereby improving survival for outmigrating smolts. Additional project benefits include improved salmon spawning and rearing habitat, improved river dynamics, enhanced floodplain and riparian vegetation habitat. Salmon habitat improvements will be accomplished by reconfiguring spawning beds and floodplain to better conform with the existing river flow regime. Native riparian vegetation will be replanted on the constructed floodplain. Natural drainage from the surrounding area coupled with normal high river flow inundation will be conducive to maintaining a vegetation community of riparian and seasonal wetland species. The large cobble and encroached vegetation will be redistributed or removed where necessary to construct a channel that contains spawning riffles, pools, runs, juvenile habitat, and provides an adequate floodplain. Project design specifications are based on the "California Salmonid Stream Habitat Restoration Manual" (DFG-October 1994) criteria and previous project experience. Proposed project schedule is as follows (progress reports on construction, budget and monitoring will be submitted quarterly):

- | | |
|-----------------|---|
| Begin Fall 1997 | - Begin environmental documentation and permitting;
- Pre-project monitoring - finalize planning, begin monitoring;
- Final engineering designs (specifications and cost estimate); |
| Spring 1998 | + Complete environmental documentation and permitting
+ Pre-construction activity, final cost estimate, bid specifications;
+ Construction contracting (bid documents, advertise, award bid); |
| Summer 1998 | - Begin Project Construction (3 mo. between JUN-SEP)
- Construction management and survey |

- Fall-Winter 1998/99 + Begin post-project monitoring
 + Begin revegetation were possible
- Spring-Fall 1999 - Complete Project Construction
 - Continue post-project monitoring
- 1998-2000 + Revegetation activities
 + Post-project monitoring
 + Evaluate project/maintenance recommendations
- 2001 - 2014 * Continue project monitoring and project with adaptive maintenance

d. Justification for Project and Funding by CALFED: The proposed project has been identified as a priority salmon restoration action in the following Central Valley salmon restoration planning documents: "Anadromous Fish Restoration Plan - Revised Draft Restoration Plan for the Anadromous Fish Restoration Program" (30May97); "California Department of Fish and Game "Restoring Central Valley Streams: A Plan for Action" (November 1993); "Joint CALFED/SJRMP San Joaquin River Fishery Technical Team Meeting Report (Preliminary Draft, February 13, 1997); "Comprehensive Needs Assessment for Chinook Salmon Habitat Improvement Projects in the San Joaquin River Basin" -- March 1994; San Joaquin River Management Plan (February 1995).

e. Budget Costs:

Total Project Cost:	\$2,637,998
Amount requested from CALFED:	<u>1,037,899</u>
Cost/share	\$1,600,099

Third Party Impacts: None anticipated at this time.

f. Applicant Qualifications: The proposed project has been planned and developed by the CDFG/CDWR Four Pumps program which has been instrumental in facilitating several salmon restoration actions within the San Joaquin and Sacramento River tributaries. During the ten-year existence of the program, the quality of projects and staff capabilities of the program has increased significantly with program experience and stakeholder input. Four Pumps restorations actions within the Central Valley continue to remain in the forefront of Central Valley salmon restoration planning efforts.

g. Monitoring and Data Evaluation: To evaluate the project success, adapt and maintain the project over the engineered life of the project; it is necessary that a monitoring program be included to address the identified project objectives. Currently, a finalized monitoring program is being prepared and the basic monitoring objectives have been identified.

h. Local Support/Coordination with other Programs/Compatibility with CALFED Objectives: The local landowner is supportive of the proposed project. The proposed project was identified by the CALFED San Joaquin River Fishery Technical Team at the January 1997 Bass Lake planning workshop as a specific project need on the Stanislaus River. Further, the proposed project has been identified specifically or in concept within several Central Valley chinook salmon planning documents including the USFWS *Anadromous Fish Restoration Plan* and the CDFG *Restoring Central Valley Streams: A Plan for Action*. The riparian revegetation portions of the project are compatible with the USACOE 1972 *Stanislaus River Parks Management Plan*. The proposed project is located in the CALFED San Joaquin Watershed Basin; targets the Priority Species San Joaquin tributaries fall-run chinook salmon; and addresses Implementation Strategy Priority Habitats #3 and #4.

II. TITLE PAGE

- a. **Project Title:** Stanislaus River Chinook Salmon Habitat Restoration Action, Willms Site
- b. **Applicant:** California Department of Fish and Game
Principal Investigator: Alan Baracco, Assistant Division Chief
Inland Fisheries Division
1416 Ninth Street, Sacramento, CA 95814
Telephone: (916) 653-4729 FAX: 916-653-8256
Internet E-mail: abaracco@hq.dfg.ca.gov
- c. **Type of Organization and Tax Status:** State of California -- tax exempt
- d. **Tax Identification Number:** 94-1697567 for DFG; 52-1692634 for DWR
- e. **Technical and Financial Contact Person(s):**

Biology- Clarence Mayott, Associate Fishery Biologist - Region 4
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Engineering Kevin Faulkenberry, Associate Engineer - San Joaquin District
California Department of Water Resource
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Coordination Fred Jurick, Associate Fishery Biologist - Inland Fishery Division
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Financial & Project Management Stephani Spaar, Environmental Specialist IV
Environmental Services Office
California Department of Water Resources
3251 S street, Sacramento, CA 95816-7017
Telephone: (916) 227-7536
Internet E-mail: sspaar@water.ca.gov

f. **Participants/Collaborators in Implementation:**

- * California Department of Fish and Game
- * California Department of Water Resources
- * US Fish and Wildlife Service CVPIA-AFRP
- * US Fish and Wildlife Service CVPIA-b13
- * Four Pumps Agreement Advisory Committee
- * Proposition 70 Advisory Committee
- * San Joaquin River Management Program

g. **RFP Project Group Type:** Construction

III. PROJECT DESCRIPTION

a. **Project Description and Approach:** The primary fishery objective of the proposed project is to remove salmon predator habitat by filling a broad (10.65 acres), relatively shallow (3-10 foot deep) instream pond, thereby improving survival for outmigrating smolts. Additional project benefits include improved salmon spawning and rearing habitat, improved river dynamics, enhanced floodplain and riparian vegetation habitat. Salmon habitat improvements will be accomplished by reconfiguring spawning beds and floodplain to better conform with the existing river flow regime (see drawings).

Bankfull discharge in streams has been determined to have a recurrence interval of 1.5 to 2.0 years (Leopold 1994). Post dam 1.5 to 2.0 year floods at the nearby Orange Blossom Bridge gage on the Stanislaus River are 1800 to 3150 cfs respectively (see flow frequency curve). Current bankfull stage estimates for the proposed project using physical indicators is 2700 cfs.

Native riparian vegetation will be replanted on the constructed floodplain. Natural drainage from the surrounding area coupled with normal high river flow inundation will be conducive to maintaining a vegetation community of riparian and seasonal wetland species.

Channel substrate is composed of large cobble and fine sediments as well as vegetation in the middle and lower portions of the channel. The large cobble and encroached vegetation will be redistributed or removed where necessary to construct a channel that contains spawning riffles, pools, runs, juvenile habitat, and provides an adequate floodplain. Channel design dimensions were taken from aerial photos and ground-truth data collected at the proposed project site. Project design specifications are based on the "California Salmonid Stream Habitat Restoration Manual" (DFG, October 1994) criteria and previous project experience.

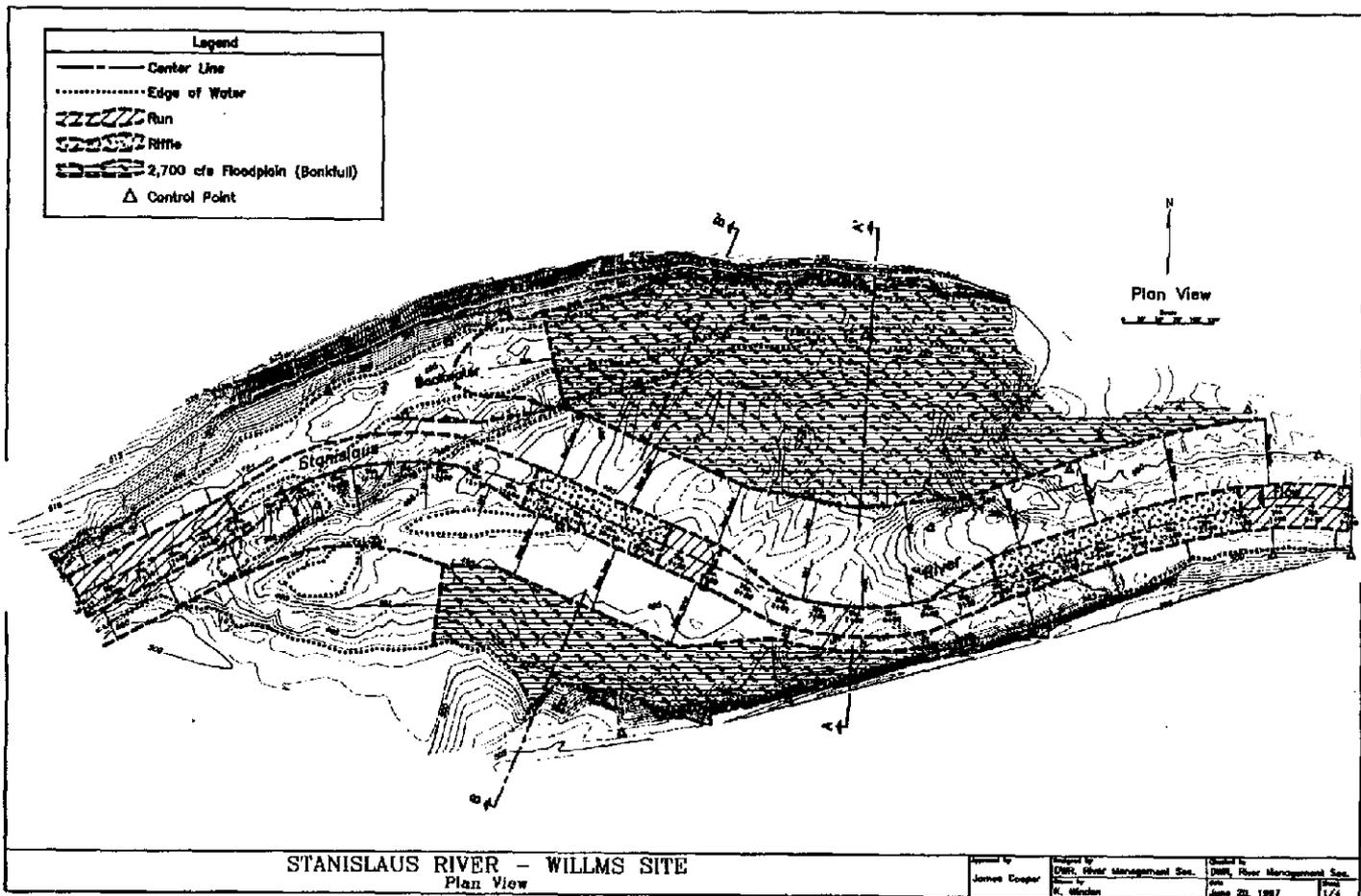
Design channel specifications* are as follow:

- ▶ Low water channel dimensions (below 225 cfs)
 - width 60 - 90 feet
 - depth (pools) 0 - 2.0 feet
 - depth (riffles) 4.0 - 6.0 feet
 - slope 0.0015
- ▶ Spawning channel dimensions (approximately 225 cfs)
 - width 86 - 100 feet
 - depth (riffles) 1.0 - 2.5 feet
 - velocity (average) 1.5 - 2.0 feet/second
 - slope 0.0015
- ▶ Bankfull channel dimensions (2700 cfs.)
 - width 190 - 250 feet
 - depth (average) 6.0 feet
 - velocity (average) 3.0 feet/second
 - slope 0.00075
- ▶ Floodplain channel dimensions (8000 cfs.)
 - width 250 -500 feet
 - slope 0.00075

*All specifications are estimates based on current info and subject to change.

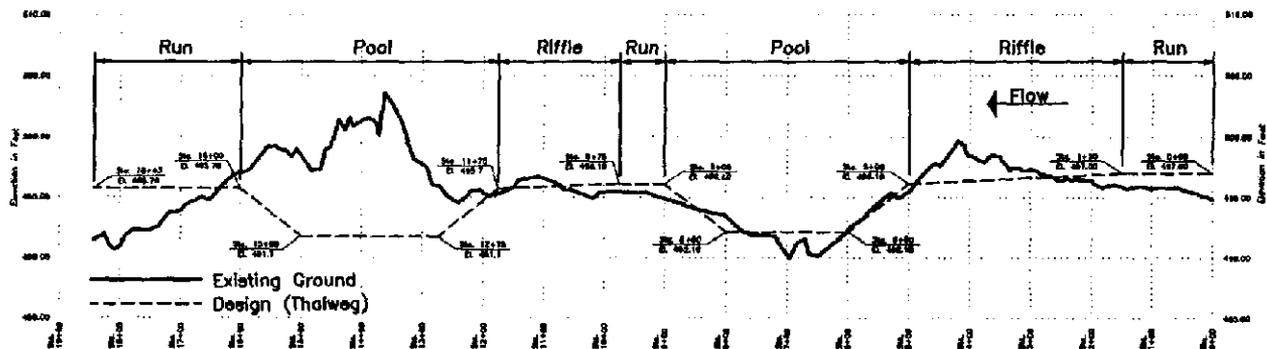
b. **Location and/or geographic boundaries of project:** (see Locator Map) The proposed project site is in the San Joaquin Watershed Basin, on the Stanislaus River between river miles 51.6 and 52.0, about 8 miles east of the town of Oakdale, Stanislaus County.

1-002728



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1-002729



Center Line Profile

Vertical Scale
 1" = 10'
 Horizontal Scale
 1" = 100'
 Note: All elevations are assumed.

STANISLAUS RIVER - WILLMS SITE
 Longitudinal Profile, Center Line of Design Channel

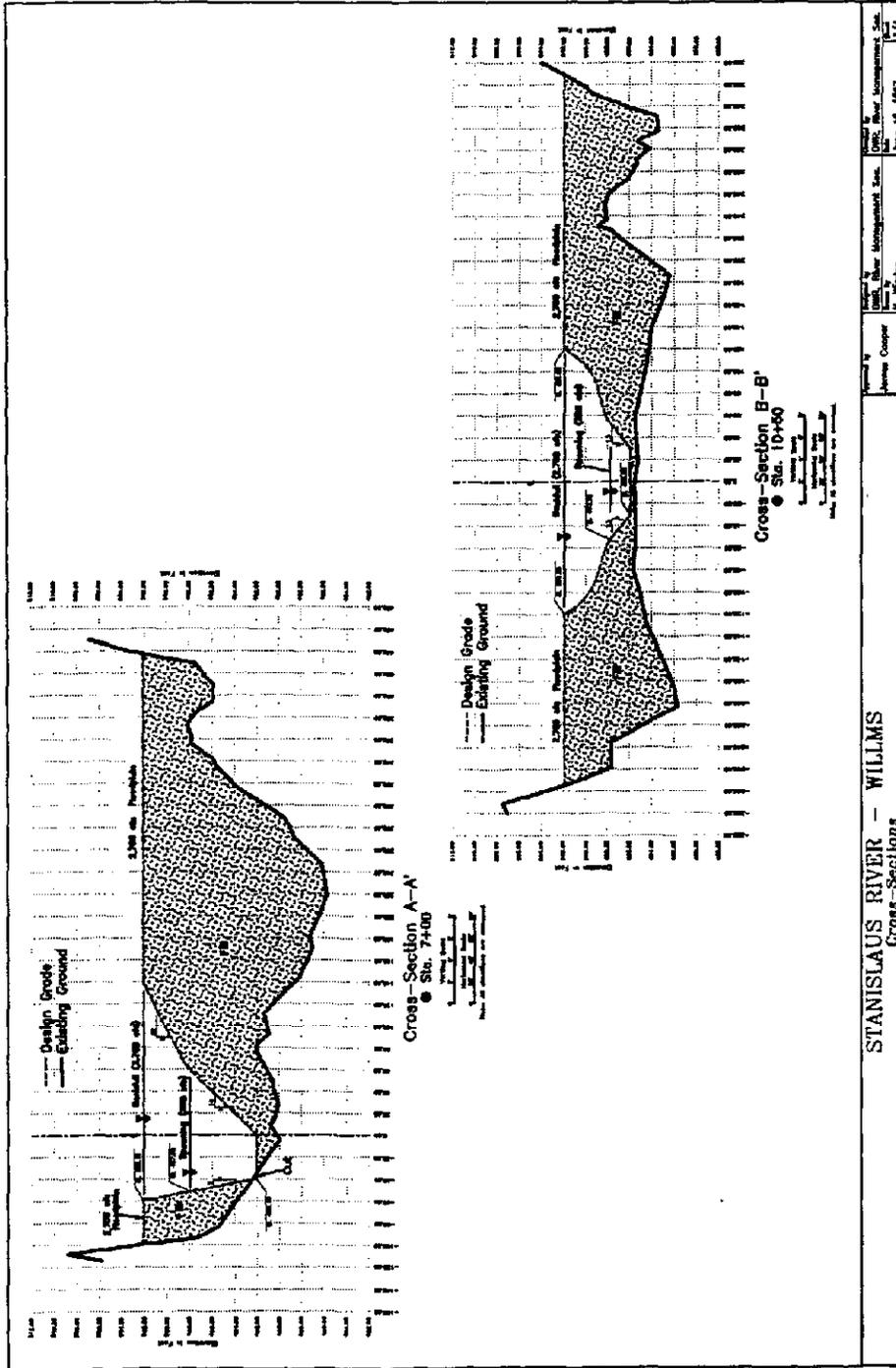
Prepared by
 James Cooper

Designed by
 DM&L River Management Soc.
 Drawn by
 J. Winkler

Checked by
 DM&L River Management Soc.
 Date
 June 20, 1987

Sheet
 2/4

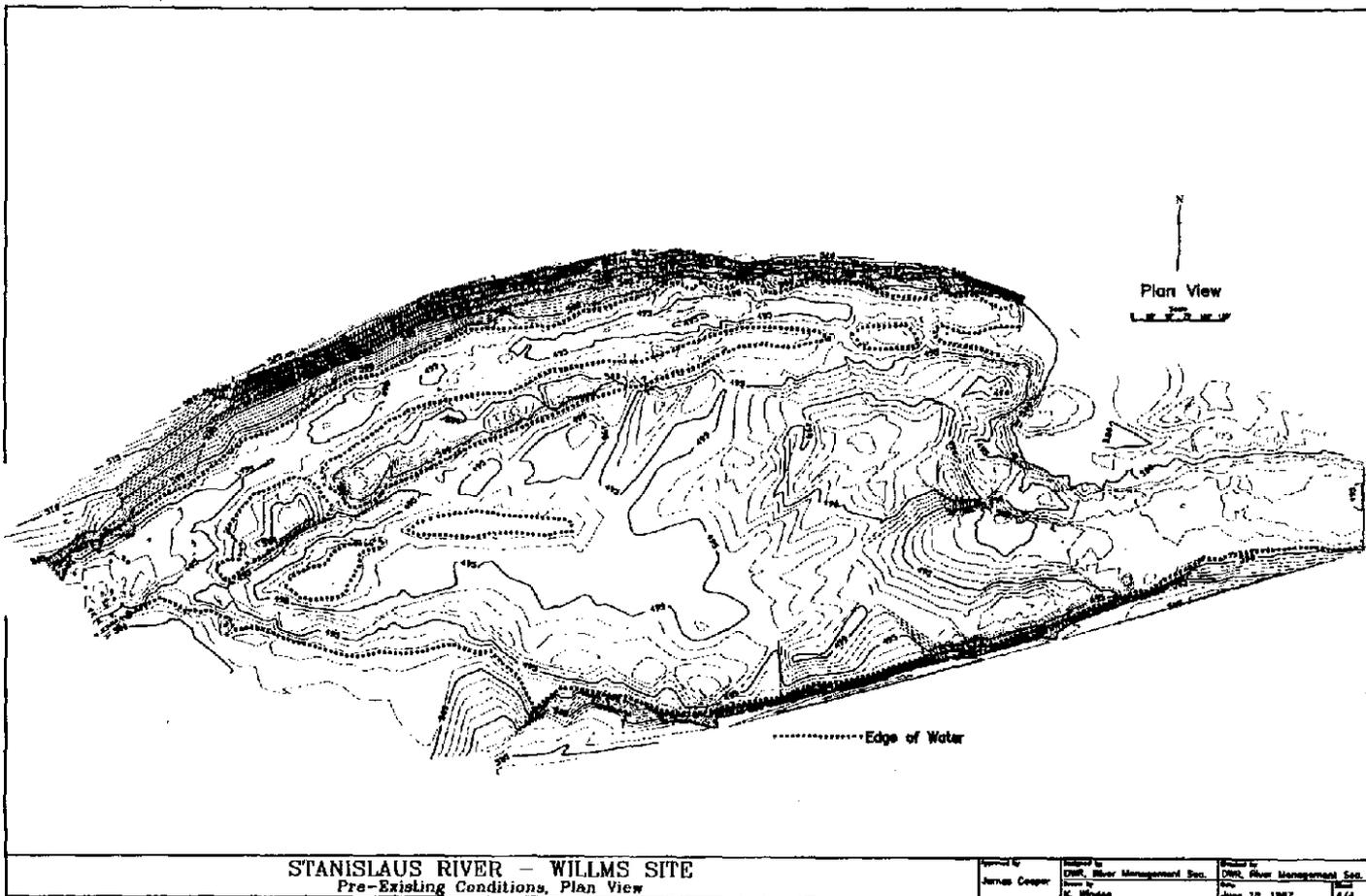
1-002729



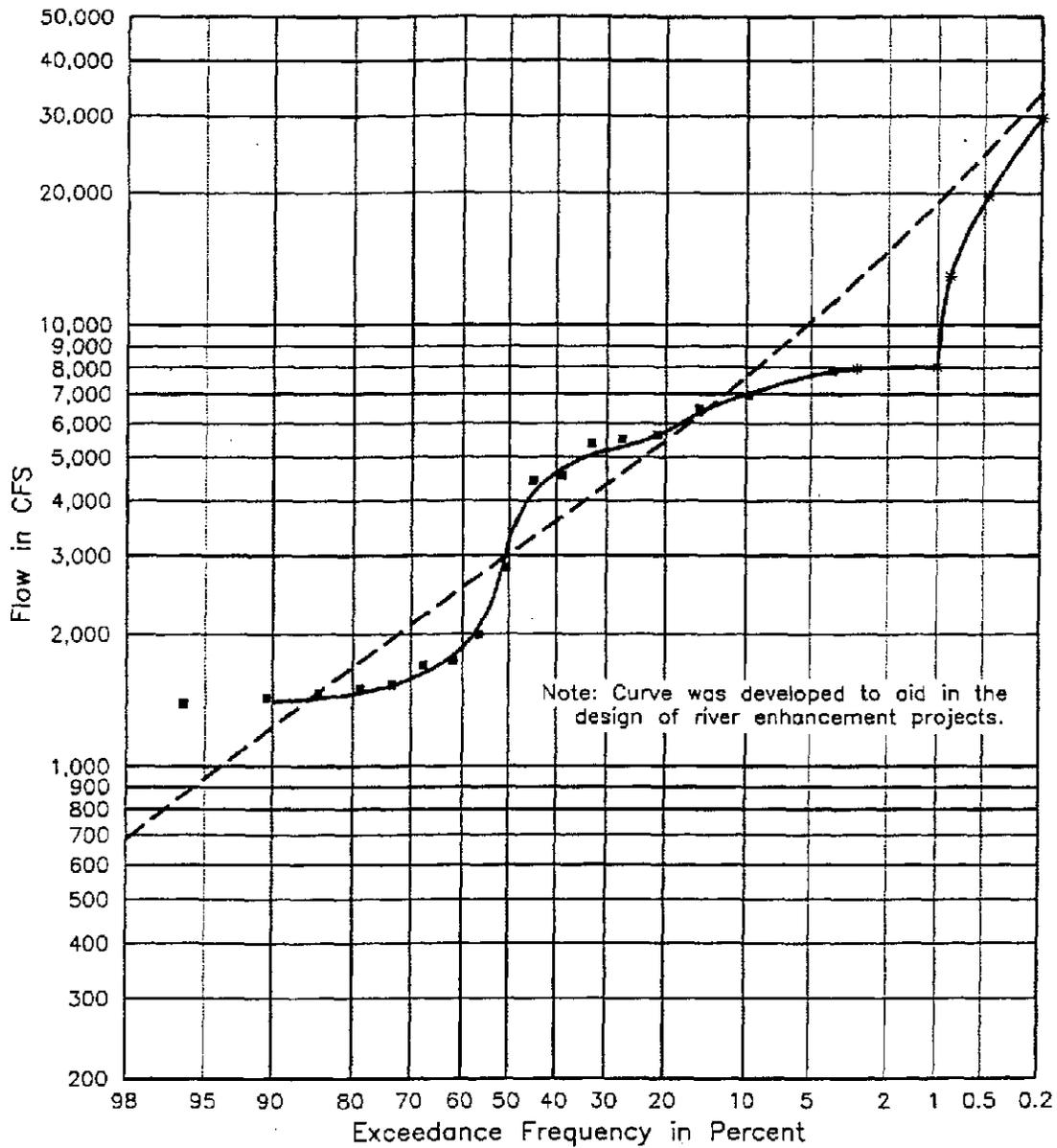
STANISLAUS RIVER — WILLMS
 Cross-Sections

Prepared by
 James Cooper
 Civil Engineer
 1111 River Management, Inc.
 1111 River Management, Inc.
 Stanislaus River Management, Inc.
 May 18, 1987
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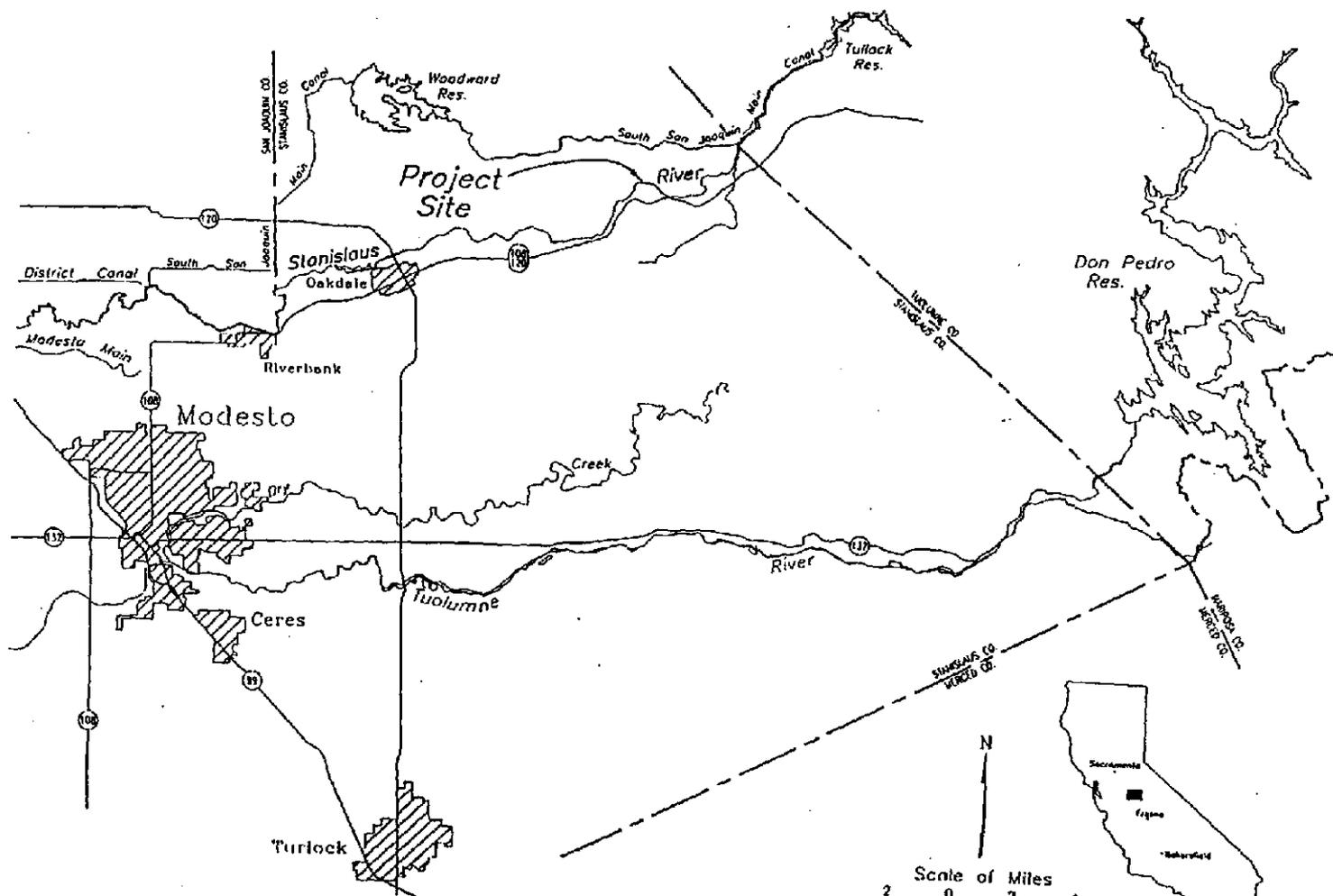
- Recommended Curve
- - - log-Pearson Type III Distribution
- Annual Peaks
- * Hypothetical Flows Based on ACOE Curves

Frequency Statistics	
Log Transform of Flow, CFS	
Mean	3.4762
Standard Dev.	0.2856
Skew	0.1112
Regional Skew	0.1000
Adapted Skew	0.1000

Number of Events	
Historical Events	0
High Outliers	0
Low Outliers	0
Zero or Missing	0
Systematic Events	17

Figure 7. Orange Blossom Bridge Curve,
Stanislaus River, Oakdale, California,
Water Years in Record,
1979-1995

1-002733



Location Map

1-002733

c. **Expected benefits:** The proposed project targets the Priority Species San Joaquin tributaries fall-run chinook salmon (USFWS species of concern) and addresses Implementation Strategy Priority Habitats #3 *Instream aquatic habitat* and #4 *Shaded riverain aquatic habitat*.

Primary Project Benefits are:

- ◆ Eliminate juvenile salmon predator habitat by filling 10.65 acres of unnatural instream pond;
- ◆ Increase the quantity and quality of spawning habitat for chinook salmon by modifying 1800 feet of channel to create 4000 square yards of spawning habitat; reconfiguring spawning beds and the river course thorough the filled pond;

Secondary Project Benefits are:

- ◆ Increase the quantity and quality of rearing habitat for chinook salmon by increasing available in-channel habitat diversity;
- ◆ Improve river and floodplain dynamics by reconfiguring the channel to better conform with the present flow regime;
- ◆ Enhance riparian and seasonally inundated vegetation by increasing and revegetating floodplain at the project site which will be captured by the river during high flows.

The proposed project objects address the following primary Ecosystem Restoration Stressors:

- ▲ **Identified Stressor #1** "Alteration of Flows and Other Effects on Water Management"-- The project proposes to reduce the effect of a migration barrier to downstream salmon smolt migration by reducing a potential predation risk/opportunity by small and largemouth bass.
- ▲ **Identified Stressor #3** "Channel Form Changes" -- Alterations of Channel Form have resulted in a lack of floodplain, degradation of instream habitat conditions, loss of lotic conditions, reduced suitability (unnatural) of in-channel corridor habitat for salmon and native wildlife species due to changes in hydraulic conditions, cover, and predation risk. Proposed stream channel manipulations are aimed at improving channel complexity, reducing substrate armoring, and increasing available gravel recruitment.

Secondary Ecosystem Stressors include: **Identified Stressor #2** "Floodplain and Marshplain Changes" -- The project intends to reestablish a functional floodplain at the project site by filling the existing instream pond. The enhanced floodplain is intended to increase gravel recruitment, stimulate fine deposition on the floodplain rather than on the river bottom, and increase available nutrients to the river system.

The proposed project has been identified specifically or in concept by the following California Central Valley chinook salmon restoration planning documents, and would provide potential benefits to these restoration programs:

- ▶ Anadromous Fish Restoration Plan (AFRP) - Revised Draft Restoration Plan for the Anadromous Fish Restoration Program (30May97) -- Stanislaus River (page 91).
ACTION 2 -- Improve watershed management to restore and protect instream and riparian habitat, including consideration of restoring and replenishing spawning gravel -- High Priority.
EVALUATION 2 -- Evaluate and implement actions to reduce predation on juvenile chinook salmon, including actions to isolate "ponded" sections of the river -- Medium Priority.
- ▶ AFRP Annual Work Plan (FY97), 11Sept96: *Specific Actions.....A-5*.
- ▶ CDFG "Restoring Central Valley Streams: A Plan for Action" (Nov. 1993); Priority A-1.
- ▶ *Joint CALFED/SJRMP San Joaquin River Fishery Technical Team Workshop Report (April 2, 1997)* -- Project #19 plus Project #52.

- ▶ CDWR and CDFG "Comprehensive Needs Assessment for Chinook Salmon Habitat Improvement Projects in the San Joaquin River Basin" -- March 1994 -- (page 27 and 61), High Priority ranking.
- ▶ San Joaquin River Management Plan (February 1995) -- page 22-23, 90-91: *Recommended Projects San Joaquin River Management Program - Salmon Action Plan* -- section 3(d, e).

d. **Background and Biological/Technical Justification:** The proposed project site is on the Stanislaus River between river miles 51.6 and 52.0, about 8 miles east of the town of Oakdale (Locator Map). In the early 1950's, an aggregate extraction pit was dug at this site to supply gravel for the construction of Tullock Dam. The gravel extraction operation was abandoned after the dam was constructed in 1958. The local landowner, who is familiar with the abandoned gravel operation, stated that only a low berm was constructed to separate the active gravel pit from the flowing river. The berm was breached by high river flows during the past decade allowing the river to bypass the original channel and flow through the abandoned gravel pit. The current watercourse no longer has adequate flows to prevent siltation and the encroachment of vegetation.

In an effort to better understand those problems influencing salmon production in the Stanislaus River, CDFG San Joaquin biologists have identified several factors which, in concert, seem to have contributed to the decline of San Joaquin fall-run chinook salmon. Among those identified factors are degraded channel, poor gravel composition, low flows, high water temperatures, low intragravel oxygen content, predation on outmigrating juvenile salmon by warmwater fish such as large and smallmouth bass, and insufficient spawning habitat (CDFG, November 1993; CDFG Memo September 6, 1991, CDFG Memo November 23, 1987).

A CDWR study analyzed gravel particle size at several sites along the Stanislaus River (CDWR, November 1994). Based primarily on gravel size, the study concluded there was sufficient salmon spawning habitat to support existing salmon stocks on the river. However, a significant sand-sized particle content was identified along the entire river particularly below River Mile 50, and recommended gravel ripping to increase permeability through sand-laden riffles. A more recent study prepared for the Stockton East Water District (Mesick, June 1997) suggested that a majority of the usable spawning habitat on the Stanislaus River was unsuitable for fall-run chinook salmon. The Stockton East study compared their results with the CDWR study and based their differing conclusions on observed salmon use of Stanislaus River spawning habitat which suggested only the upper 30-feet of available spawning riffles were actually used, and poor intragravel dissolved oxygen and temperature measurements were found. Poor intragravel salmon spawning conditions were attributed to excessive fine content and decaying organic material within the gravel. A recently published chinook salmon habitat evaluation on the American River (CDFG, May 1997) supports the Stockton East methodology by concluding that spawning distribution was best explained by intragravel conditions rather than gravel size alone.

The various effects of historic aggregate mining in the river channel are significant among the many problems identified which influence current river dynamics and negatively impact chinook salmon habitat and survival. These mining activities have left deep pits within the river corridor. Many of these pits were once protected by levees that were washed out during high river flows, such as those experienced during the flood years of 1986 and the early 1990's. The river now flows through these pits creating warm ponds of slow-moving water which are ideal habitat for large and smallmouth bass and other salmon smolt predators. A pilot study which investigated predation of juvenile salmon in ponded portions of the Tuolumne River indicated that small and largemouth bass were a legitimate predator of juvenile chinook salmon (EA, September 1990). Based on the study data, which is supported in previous literature (EA, September 1990), and supported by the well accepted fact that

most ponded portions of the Stanislaus, Tuolumne, and Merced Rivers provide excellent bass fishing, it has been assumed that this same salmon predator relationship exists in all captured mining pits throughout the east-side San Joaquin basin tributaries. The juvenile salmon migrating downstream become disoriented in the slow moving waters of the pond and become extremely vulnerable to predation by bass and other potential predators. Juvenile salmon transiting through these warm water ponds are less likely to survive than those salmon smolts outmigrating in faster moving cool river water. In addition, it is logical to assume that the ponds also serve as a reproduction site, rearing area, and distribution point from which these salmon predators migrate and recharge the river system.

Further, flows on the Stanislaus River have been reduced in magnitude, duration and frequency compared to historic natural flows. Lower flows have drastically changed the historic river geomorphology by substantially reducing gravel recruitment, perching floodplain, and allowing vegetation to encroach into the active channel. The perched floodplain, now farmed or grazed, no longer support large riparian tracts that shade the river, provide food habitat, woody debris for stream diversity, and nutrients to support a healthy aquatic environment. As a consequence, much of the salmon habitat has disappeared and the remainder is in very poor condition. Spawning, rearing, aquatic, and riparian habitats are all necessary components for prime salmon habitat.

Eliminating these predator ponds will improve river flow characteristics, return floodplain and riparian shade, and help to diversify the total river ecosystem. Improving the river dynamics and diversifying the river characteristics will enrich the quantity and quality of salmon spawning and rearing habitat, improve both the adult and juvenile salmon migration pathway, and enhance salmon tributary survival by reducing contact of juvenile salmon smolts with predator fish species.

e. Proposed Scope of Work

Proposed Project Schedule: (See Attached Schedule)

Deliverables:

- ▶ Quarterly Progress Reports - Construction, financial, monitoring, etc.
(First report Feb 15, 1998 for Oct-Dec 1997)
- ▶ Detailed Monitoring Plans - Fisheries, Geomorphic, Revegetation (Fall 1997-Winter 1998);
- ▶ Pre-project baseline monitoring report (Spring 1998);
- ▶ Preliminary (completed) and final engineering designs, cost estimate, bid specs (Winter 1998);
- ▶ Project environmental documentation and permits - CEQA/NEPA (Winter 1998);
- ▶ Project supervision, and construction report (Fall 1999);
- ▶ Post-project monitoring for two years with end of year reports (Dec 1999, 2000);
- ▶ Project evaluation and maintenance recommendation.

f. Monitoring and Data Evaluation: To evaluate the project success as well as adapt and maintain the project over the engineered life of the project, it is necessary that a monitoring program be included to address the identified project objectives. Although finalized monitoring program are still in the planning, the basic monitoring procedures are as follows:

Juvenile Chinook Salmon Predator Removal

1. Pre-project pond sampling (electro-shock survey) - Develop baseline fish community description and life stage composition with similar sampling at a representative pond location.
2. Post-project fish composition sampling at the same locations. The representative pond site will be evaluated as a control point while instream survey data will estimate project impact to streamcourse

fish community and life stage composition.

3. Sampling will occur at least once prior to project construction and then continue each spring and fall for two years after project completion.

Chinook Salmon Spawning and Rearing Habitat Improvement

1. Pre-project sampling - Aquatic macro-invertebrate survey description of project and control sites in addition to fish community and life stage composition surveys previously mentioned.
2. Pre- and post-project geomorphic survey parameters of concern - Gravel permeability, intragravel dissolved oxygen, intragravel temperatures, water surface elevation and gradient.
3. Post monitoring would continue the above sampling during the same spring and fall schedule for two years following the project and then at five year intervals for 15-years.
4. Yearly monitoring of spawning use would be conducted and compared with historic area spawning use.

Improved River and Floodplain Dynamics

1. Pre- and post-project bed material sampling of substrate conditions: Pebble counts and bulk gravel samples on point bars and riffles; Cross sections; Install scour chains on riffles.
2. First event over 3000 cfs and once after 5-years evaluation: Pebble counts on riffles and point bars; Cross sections; Monitor for lateral migration on outside curves; Reset and evaluate scour chains (depth of bed movement).
3. Events greater than 7000 cfs. (3 events): Pebble counts on riffles and point bars; Topographic survey if large movement is apparent; Monitor for lateral migration on outside curves; Reset and evaluate scour chains.
4. After 5-, 10-, and 15-years: Pebble counts and bulk sample analysis; Topographic survey of project site; Reset and evaluate scour chains; Monitoring Report.

Enhanced Riverain Vegetation

1. Pre-project - Document basic instream and floodplain plant and wildlife community composition by on-site inventory, photo stations, and existing aerial photography. Existing habitat community will be compared with known historic wildlife community composition.
2. Post-project - Continue to document annual plant/wildlife community composition through aerial and ground surveys and photography. Documentation technique will be compatible with US Army Corps of Engineers "Habitat Mitigation and Monitoring Proposal Guidelines".

The initial monitoring program is planned for three years. Information gained within that time will be used to modify the original project, if necessary, and plan a monitoring system for the remainder of the expected project life. An alternative to the above plan is provided in Appendix I - Project Title (#52) (p. F-54). - Joint CALFED/SJRMP San Joaquin River Fishery Technical Team Workshop Report (April 2, 1997).

g. Implementability: Construction is planned to begin in Summer 1998. Due to the large amount of imported fill required, construction will continue into Summer 1999. Preliminary engineering has been completed and final project designs are in preparation. This phase has been funded through CDWR from the Four Pumps Program. The project will comply with all required Federal and State laws, regulations, and environmental documentation review. USFWS and CDFG/CDWR staff have met to discuss preparation of a joint CEQA/NEPA environmental document. This document will be based on the Stanislaus River Parks Management Plan prepared in 1972 by the

US Army Corps of Engineers (USACOE).

Local and environmental support for this project was acknowledged at the CALFED/SJRMP San Joaquin River Fishery Technical Team meeting in January 1997 when the group agreed to include this project in the final report (Project #19). The local landowner is supportive of the project. Currently there is an positive dialog between the landowner and CDFG staff discussing outright purchase or long-term easement to the proposed project site. The USACOE already has riparian easement rights to the property and CDFG has a valid license (No. DACW05-3-94-549) to perform habitat restoration projects under the auspices of the USACOE easement.

LITERATURE CITED

CDFG, Memo November 23 1987. "*Short List of Proposed Measures to Replace Salmon and Steelhead Lost at the South Delta Pumps*"; Memorandum from Forrest Reynolds (CDFG Supervisor, Fishery Enhancement Program) to Pete Chadwick (CDFG Chief, Bay-Delta Division).

EA, September 1990. "*Preliminary data from a study of predation of piscivorous fish on young chinook salmon in the lower Tuolumne River, 1990*"; preliminary summary report prepared for CDFG by EA Engineering, Science, and Technology - Western Division (Lafayette, CA).

CDFG, Memo September 24 1991. "*Draft Short List of Sacramento-San Joaquin River System Habitat Restoration Projects*"; included in memorandum from Pete Bontadelli (CDFG Director) to Mr. Ted Selb, Merced, CA (local landowner and stakeholder).

DFG, November 1993. "*Restoring Central Valley Streams: A PLAN FOR ACTION*"; Compiled by Forrest L. Reynolds, Terry J. Mills, Randy Benthin, and Alice Low.

DFG, October 1994. "*California Salmonid Stream Habitat Restoration Manual*"; CDFG, Inland Fisheries Division publication, second edition prepared by Gary Flosi and Forrest L. Reynolds with contribution from Tim Curtis, Michael Bird, Scott Downie, and James Hopelain.

DWR, November 1994. "*San Joaquin River Tributaries Spawning Gravel Assessment*"; contract study by CDWR for CDFG.

Leopold 1994. "*A view of the River*"; Harvard University Press, Cambridge. 298 p.

DFG, May 1997. "*Lower American River CHINOOK SALMON HABITAT EVALUATION: October 1994 -- An Evaluation of Attributes Used to Define the Quality of Spawning Habitat*"; Final CDFG Contract (FGR2954-1) Report of to East Bay Municipal Utility District, by Kris Vyverberg, Bill Snider, and Robert G. Titus.

Mesick, June 1997. "*Review Draft - A Fall 1996 Study of Spawning Habitat Limitations For Fall-Run Chinook Salmon in the Stanislaus River Between Goodwin Dam and Riverbank*"; prepared by Carl Mesick Consultants (El Dorado, CA) for Stockton East Water District (Stockton, CA) and Neumiller & Beardslee (Stockton, CA).

IV. COSTS AND SCHEDULE TO IMPLEMENT PROPOSED PROJECT

a. Budget Costs

Total project cost, including preliminary engineering, pre- and post-monitoring, environmental documentation, construction, revegetation, maintenance, and reporting is estimated to be \$2,637,998 (cost breakdown, Tables 1-2). CDWR will manage the project's financial aspects including subcontracts with CDFG for revegetation activities and biological monitoring. CDWR's Division of Engineering will conduct the construction bid process and construction contract management.

CALFED funding is needed to complete the cost-share funding for the project with State and Federal funding listed below. As identified in section III-c, the proposed project has been identified as a priority restoration action in several State and Federal salmon restoration plans. A project proposal has been submitted to CVPIA for funding and has received a favorable review by CVPIA staff and consultants. Project development staff have been working with CVPIA representatives and there is a tentative agreement for cost-share by CVPIA-AFRP. CVPIA- Section (b)(13) is anticipated to cost-share the Gravel Restoration, Riparian Enhancement and Maintenance portions of the project. Because the need for future gravel replenishment at the project site is expected by involved CDFG and CDWR project planning staff, discussions are in progress to include this project site in the "Draft Long-term Spawning Habitat Restoration Plan: CVPIA Section (b)(13)" as a gravel replenishment and chinook salmon spawning maintenance site on the Stanislaus River. Following is the current status of project funding:

Secured or expended project funding:

a. CDFG preliminary survey	\$ 2,000
b. CDWR preliminary engineering	\$ 50,000
c. Four Pumps Annual Account	\$ 160,200
d. DFG -- Proposition 70 (FY 97)	\$ 50,000
Total Committed	\$ 262,200

Requested funding to complete total project:

e. CVPIA -- AFRP Program (50% total project)	\$1,037,899
f. CVPIA -- B-13 Program (gravel restoration)	\$ 300,000
g. CALFED -- Category III	\$ 1,037,899
<i>*Restoration Activity Total</i>	<i>\$2,637,998</i>

b. Scheduled Milestones

- ▶ Cost-share agreements in-place - March 1, 1998
- ▶ Complete environmental documentation and permits process - March 1, 1998
- ▶ Complete construction cost estimate and bid specifications - March 31, 1998
- ▶ Complete bid process and award contract - June 1, 1998
- ▶ Begin construction - June/July 1, 1998 (Construction window is June-September)
- ▶ Complete construction - September 30, 1999
- ▶ Begin revegetation - December 1, 1999

c. Third Party Impacts

Third party impacts are not anticipated for this specific project because it will be one of the first of it's kind. Yet, when more projects of this type are completed and the primary objective of the proposed project is in fact realized (reduce bass predation of juvenile salmon), the recreational bass

TABLE 1. Projected budget, Stanislaus River Chinook Salmon Restoration Action

**STANISLAUS RIVER CHINOOK SALMON RESTORATION ACTION
WILLMS SITE**

PROJECTED BUDGET

PROJECT PHASE & TASK	PRIOR FY'S	FY 96-97	FY97-98	FY 98-99	FY 99-00	FY 00-01	TOTAL
PRELIMINARY SURVEY & ENGINEERING	\$45,000	\$5,000					\$50,000
FINAL DESIGN & ENGINEERING		\$59,097	\$10,903				\$70,000
ENVIRONMENTAL DOCUMENTS & PERMITS			\$80,000				\$80,000
COST/SPECS; BID PROCESS, CONTRACT MGMT			\$30,000	\$25,000	\$15,000		\$70,000
CONSTRUCTION			\$281,813	\$845,440	\$563,627		\$1,690,880
CONSTRUCTION MANAGEMENT & SURVEY			\$20,913	\$62,740	\$41,827		\$125,480
REVEGETATION & HABITAT ENHANCEMENT, MONITORING				\$20,000	\$60,000	\$20,000	\$100,000
PROJECT EVALUATION & MONITORING			\$25,000	\$25,000	\$75,000	\$35,000	\$160,000
MAINTENANCE						\$100,000	\$100,000
PROJECT MANAGEMENT (DWR - ESO)		\$2,390	\$5,760	\$5,760	\$5,760	\$2,880	\$22,550
CONTINGENCY (10% CONSTRUCTION)				\$169,088			\$169,088
TOTALS	\$45,000	\$66,487	\$454,389	\$1,153,028	\$761,214	\$157,880	\$2,637,998

TABLE 2. Itemized Project Costs, Stanislaus River Chinook Salmon Restoration Action

a. Preliminary Field Survey and Engineering.....		\$52,000
b. Final Design Engineering		
I. Creation of Preliminary design for funding search and peer review. Includes data collection design and coordination meetings.		
Associate Eng \$580.00/day(20 days)	\$16,600	
Assistant Eng \$486.00/day(28 days)	\$13,608	
Student \$264.00/day(9 days)	\$2,376	
Delineator \$437.00/day(3 days)	\$1,311	
Supplies	\$973	
II. Creation of final design after peer review and funding requirements are met. Includes data collection design and coordination meetings.		
Associate Eng \$580.00/day(20 days)	\$16,600	
Assistant Eng \$486.00/day(28 days)	\$13,608	
Student \$264.00/day(10 days)	\$2,640	
Delineator \$437.00/day(3 days)	\$1,311	
Supplies	\$973	
	Total.....	\$70,000
c. Environmental Documentation		\$80,000
d. Prepare Project Cost Estimate, Bid Specifications and Documents (per State guidelines), advertise, bid, award and manage construction contract	\$70,000	
e. Project Construction		
<u>Material costs:</u>		
round trip (85.0 miles) - 2 hours		
load and dump time - 45 min		
Material (as per Bill Brown Sante Fe Gravel) \$1.00/ ton + tax		
Truck and driver \$60.00/hr.		
unit weight 1.7 ton/yard		
material 102,000 cubic yards		
	$(2.75 \text{ hrs} * (\$60.00/ \text{hr.}) + \$1.0775/\text{ton}(24 \text{ ton/truck}))$	
	$(24 \text{ ton/truck}) = \$7.95/\text{ton}$	
	$1.7 \text{ ton/yard}(\$7.95/\text{ton}) = \$13.52/\text{yard}$	
<u>Equipment:</u>		
(102,000 cubic yards)(\\$13.52/ton)		=\$1,379,040
Dozer D-8 \$12,000/mo (6 mos)		=\$72,000
Operator \$45.00/hr (8 hrs)(20 days)(6 mos)		=\$43,200
Dozer D-7 \$10,000/mo (6 mos)		=\$60,000
Operator \$45.00/hr (8 hrs)(20 days)(6 mos)		=\$43,200
Water truck \$4,000/mo (6mos)		=\$24,000
Operator \$42.00/hr (8 hrs)(20 days)(6 mos)		=\$40,320

TABLE 2. (Continued)

Excavator \$70.00/hr (8 hrs)(20 days)	= \$11,200	
Operator \$62.00/hr (8 hrs)(20 days)	= \$9,920	
Mob. and demob (\$2,000/item) 4 items	= \$8,000	
	Total Construction Cost.....	\$1,690,880
f. Construction management and construction survey		
120 days of construction (20 days/month = 3 months)		
Associate Eng. (\$580.00/day)(20 days/mo)(6 mos)	= \$69,600	
Per diem \$100/day(16 day/mo)(6 mos)	= \$9,600	
Student \$264/day (20 days/mo)(6 mos)	= \$31,680	
Per diem \$100/day(16 day/mo)(6 mos)	= \$9,600	
Supplies	= \$5,000	
	Sub-total.....	\$125,480
g. Revegetation, Habitat Enhancement and Monitoring.....		
		\$100,000
h. Project Evaluation and Monitoring		
		\$160,000
i. Maintenance		
Set aside to address areas of project concern and repairs to be identified during the project monitoring process		\$100,000
j. Project Management		
ES IV (\$480/day)(\$2390 to date + 42 mos @ 1 day/mo)		\$22,550
k. Contingency (10% of construction costs)		
		<u>\$169,088</u>
Project Cost: Stanislaus River Chinook Salmon Habitat Restoration Action, Willms Site -- River Mile 51.6 to 52.0.....		\$2,637,998

Note: Estimates include direct and indirect costs.

fishing opportunity on the Stanislaus (and other San Joaquin tributaries) may decline. The proposed project monitoring program will gain insight to the expected predator fish population decline. Once a significant rate of decline is confirmed, mitigation measures will be addressed. Currently, the sportfishing opportunity greatly outnumbers any impact generated by this project alone.

V. APPLICANT QUALIFICATIONS

The CDFG is the legislative mandated "trustee of the State's fish and wildlife resources" and has for several decades been involved with salmon restoration actions within California. Specific to the Central Valley, since the 1986 Delta Fish Protection Agreement (Four Pumps Agreement) between CDFG and CDWR, the Four Pumps program has been instrumental in facilitating several salmon restoration actions within the San Joaquin and Sacramento River tributaries. The Four Pumps Program is unique in that it allow the two agreement parties, CDFG and CDWR, to draw upon the specialized talents and expertise which are available within the two California Resources Departments. During the ten-year existence of the program, the quality of projects and staff capabilities of the program has increased significantly with program experience and stakeholder involvement. Four Pumps restorations actions within the Central Valley continue to remain in the forefront of Central Valley salmon restoration planning efforts. Following are qualifications of the identified project contacts:

Biology Coordination - Clarence Mayott, Associate Fishery Biologist, CDFG Region 4 (Fresno). Mr. Mayott has managed the San Joaquin Salmon Habitat Crew for three years to facilitate anadromous fish restoration actions within the San Joaquin basin. Under the direction of the Region 4 Anadromous Fish Program Supervisor, Mr. Mayott has been instrumental in the planning and development of all salmon restoration activity within the San Joaquin. Prior to his current position, Mr. Mayott was involved with the California Agriculture Department spray programs in the San Joaquin. This knowledge and his local landowner contact has proved beneficial in the project planning activities.

Engineering Coordination - Kevin Faulkenberry, Associate Engineer (Registered) in CDWR San Joaquin District. Currently Mr. Faulkenberry manages the San Joaquin District's salmon habitat restoration program. While working to manage this program, Mr. Faulkenberry has developed many cooperative relations with local, State and federal agencies that have proven to be instrumental in all phases of project development and implementation. Mr. Faulkenberry has five years of experience in planning, permitting, surveying, design, and construction management of river restoration projects on the San Joaquin River system while working for the Department of Water Resources. Familiar with gravel replacement, predator habitat isolation, floodplain restoration and backwater stabilization, Mr. Faulkenberry has completed numerous successful projects on the Stanislaus, Tuolumne, Merced and San Joaquin Rivers. Mr. Faulkenberry also has training in developing hydraulic models for HEC-2, flow-frequency and sediment-transport analysis.

Project Development Coordination - Fred Jurick, Associate Fishery Biologist (M.S. Natural Resource Management) in CDFG Inland Fisheries Division. Mr. Jurick has been the DFG Four Pumps Salmon Coordinator since 1993 and responsible for coordinating with the CDFG/CDWR field staff to develop and facilitate salmon restoration projects. These activities have included (but not limited to) coordination of project planning efforts, preparing project proposals, secure funding approval, prepare environmental documentation, acquire project permits, and coordinate environmental compliance activities. Prior to his role as CDFG Four Pumps Salmon Coordinator, Mr. Jurick was involved for several years in fishery development work on the California North Coast which included salmon restoration actions.

Financial Coordination - Stephani Spaar is an ES IV (M.S. Fisheries Biology) in DWR's Environmental Services Office has been with DWR since 1987. Four Pumps Program staff biologist 1988-1990, leadperson for various Interagency Ecological Program estuarine fisheries studies 1987-

1994. Current position with the Four Pumps Program (1994- present) involves project management and coordination of various aspects of implementation for over 15 current fish mitigation projects, including the proposed Willms project. Responsibilities include preparation and management of contracts (up to \$2.5 million/contract) and budgets (up to \$27 million for one project), coordination with non-Four Pumps funding on cost-share projects, project tracking and scheduling, and close coordination with CDFG and other DWR divisions on permitting, engineering, and other aspects of project implementation. The Willms project is one of about eight projects worked on at various implementation stages (completed to recently approved) involving salmon predator habitat removal/isolation or spawning habitat improvement.

VI. Compliance with standard terms and conditions.

Funding for the proposed project is anticipated to follow normal State Interagency Agreement policy and guidelines as well as the CALFED Terms and Conditions specified within the 1997 Category III - Request for Proposals (Attachment D). Although CDFG is the identified lead agency, financial management and primary contractor responsibilities of the project would be handled by CDWR. CDFG portions of the project would be dealt with through routine CDFG/CDWR Interagency Agreements. Although not anticipated at this time, any non-State projects need would be handled through the normal CDWR Contract process and in compliance with State requirements. Included in the State of California Interagency Agreement is 1] Description of Services; 2] Payment schedule; 3] Terms (time frame) of the Agreement; 4] Contract managers; 5] "Standard Clauses - Interagency Agreement"; 6] signatures of responsible agency representatives receiving and providing services.

Because CDWR is handling financial management of the proposed project, a two party Interagency Agreement between CALFED and CDWR would be preferred. Terms of the required project financing (necessary payment schedule) will be available once final project engineering is completed by Winter 1997. The initial terms would be for a 3-year period. Prior to the end of the 3-year agreement period, preliminary project monitoring results would indicate future funding needs.

Following is an example of the "Standard Clauses - Interagency Agreements" form:

Agreement No. _____

Exhibit _____

**STANDARD CLAUSES -
INTERAGENCY AGREEMENTS**

Audit Clause. For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

Availability of Funds. Work to be performed under this contract is subject to availability of funds, ^{Category III}

Interagency Payment Clause. For services provided under this agreement, charges will be computed in accordance with State Administrative Manual Section 8752 and 8752.1.

Termination Clause. Either State agency may terminate this contract upon 30 days advance written notice. The State agency providing the services shall be reimbursed for all reasonable expenses incurred up to the date of termination.