

# **Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts**

## **Project Information**

### **1. Proposal Title:**

Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts

### **2. Proposal applicants:**

Doug Demko, S.P. Cramer & Associates, Inc.

### **3. Corresponding Contact Person:**

Doug Demko  
S.P. Cramer & Associates, Inc.  
P.O. Box 247 Mi Wuk Village, CA 95346  
209 586-5020  
demko@dcs-chico.com

### **4. Project Keywords:**

**At-risk species, fish  
Entrainment  
Fish Passage/Fish Screens**

### **5. Type of project:**

Fish Screen

### **6. Does the project involve land acquisition, either in fee or through a conservation easement?**

No

### **7. Topic Area:**

Fish Screens

### **8. Type of applicant:**

Private for profit

### **9. Location - GIS coordinates:**

Latitude: 39.206

Longitude: -121.406

Datum:

**Describe project location using information such as water bodies, river miles, road intersections, landmarks, and size in acres.**

The South Yuba-Brophy headworks are located just above the Daguerra Point Dam on the Yuba River, adjacent to the Yuba Goldfields, roughly 9 miles northeast of Marysville, California. The headworks are located at approximately river mile 11.3 on the Yuba River.

**10. Location - Ecozone:**

8.2 Yuba River

**11. Location - County:**

Yuba

**12. Location - City:**

Does your project fall within a city jurisdiction?

No

**13. Location - Tribal Lands:**

Does your project fall on or adjacent to tribal lands?

No

**14. Location - Congressional District:**

2

**15. Location:**

**California State Senate District Number: 1**

**California Assembly District Number: 3**

**16. How many years of funding are you requesting?**

3

**17. Requested Funds:**

a) Are your overhead rates different depending on whether funds are state or federal?

No

If no, list single overhead rate and total requested funds:

Single Overhead Rate: 0

Total Requested Funds: \$406,520

b) Do you have cost share partners already identified?

No

c) Do you have potential cost share partners?

**No**

d) Are you specifically seeking non-federal cost share funds through this solicitation?

No

If the total non-federal cost share funds requested above does not match the total state funds requested in 17a, please explain the difference:

**18. Is this proposal for next-phase funding of an ongoing project funded by CALFED?**

No

Have you previously received funding from CALFED for other projects not listed above?

**No**

**19. Is this proposal for next-phase funding of an ongoing project funded by CVPIA?**

**No**

Have you previously received funding from CVPIA for other projects not listed above?

Yes

If yes, identify project number(s), title(s) and CVPIA program.

**11332-9-j010      Evaluate the use of radio-tagged juvenile chinook salmon to identify cause and location of mortality      AFRP**

**11332-0-M007      Juvenile salmon outmigration monitoring at Caswell      AFRP**

<b>Funds direct from BOR</b>	<b>Evaluation of Smolt Survival</b>	<b>AFRP (Funds Direct from Burea of Reclamation)</b>
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**20. Is this proposal for next-phase funding of an ongoing project funded by an entity other than CALFED or CVPIA?**

No

**Please list suggested reviewers for your proposal.** (optional)

**21. Comments:**

# Environmental Compliance Checklist

## Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts

### 1. CEQA or NEPA Compliance

- a) Will this project require compliance with CEQA?

Yes

- b) Will this project require compliance with NEPA?

Yes

- c) If neither CEQA or NEPA compliance is required, please explain why compliance is not required for the actions in this proposal.

### 2. If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies). If not applicable, put "None".

CEQA Lead Agency: California Department of Fish and Game

NEPA Lead Agency (or co-lead:) US Fish and Wildlife Service

NEPA Co-Lead Agency (if applicable):

### 3. Please check which type of CEQA/NEPA documentation is anticipated.

#### CEQA

-Categorical Exemption

Negative Declaration or Mitigated Negative Declaration

-EIR

-none

#### NEPA

-Categorical Exclusion

Environmental Assessment/FONSI

-EIS

-none

If you anticipate relying on either the Categorical Exemption or Categorical Exclusion for this project, please specifically identify the exemption and/or exclusion that you believe covers this project.

### 4. CEQA/NEPA Process

- a) Is the CEQA/NEPA process complete?

No

If the CEQA/NEPA process is not complete, please describe the dates for completing draft and/or final CEQA/NEPA documents.

The permitting process is scheduled to begin on January 1, 2003 and documents will be completed no later than June 30, 2004. We allowed a year and a half for permitting should unforeseen problems arise.

b) If the CEQA/NEPA document has been completed, please list document name(s):

5. **Environmental Permitting and Approvals** (*If a permit is not required, leave both Required? and Obtained? check boxes blank.*)

**LOCAL PERMITS AND APPROVALS**

Conditional use permit

Variance

Subdivision Map Act

Grading Permit

General Plan Amendment

Specific Plan Approval

Rezone

Williamson Act Contract Cancellation

Other Required

**STATE PERMITS AND APPROVALS**

Scientific Collecting Permit Required, Obtained

CESA Compliance: 2081 Required

CESA Compliance: NCCP Required

1601/03 Required

CWA 401 certification Required

Coastal Development Permit

Reclamation Board Approval Required

Notification of DPC or BCDC

Other

**FEDERAL PERMITS AND APPROVALS**

ESA Compliance Section 7 Consultation Required

ESA Compliance Section 10 Permit Required

Rivers and Harbors Act

CWA 404 Required

Other

## **PERMISSION TO ACCESS PROPERTY**

Permission to access city, county or other local agency land.

Agency Name: South Yuba and Brophy Water Districts

Required, Obtained

Permission to access state land.

Agency Name:

Permission to access federal land.

Agency Name:

Permission to access private land.

Landowner Name:

### **6. Comments.**

#4b. The dates listed are for all permits and approvals, not CEQA/NEPA only. #5. "Other" permit under Local Permits and Approvals is Yuba County floodlain encroachment approval.

# **Land Use Checklist**

## **Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts**

- 1. Does the project involve land acquisition, either in fee or through a conservation easement?**

No

- 2. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?**

Yes

- 3. Do the actions in the proposal involve physical changes in the land use?**

No

If you answered no to #3, explain what type of actions are involved in the proposal (i.e., research only, planning only).

research and planning only

- 4. Comments.**



# **Conflict of Interest Checklist**

## **Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts**

Please list below the full names and organizations of all individuals in the following categories:

- Applicants listed in the proposal who wrote the proposal, will be performing the tasks listed in the proposal or who will benefit financially if the proposal is funded.
- Subcontractors listed in the proposal who will perform some tasks listed in the proposal and will benefit financially if the proposal is funded.
- Individuals not listed in the proposal who helped with proposal development, for example by reviewing drafts, or by providing critical suggestions or ideas contained within the proposal.

The information provided on this form will be used to select appropriate and unbiased reviewers for your proposal.

### **Applicant(s):**

Doug Demko, S.P. Cramer & Associates, Inc.

### **Subcontractor(s):**

Are specific subcontractors identified in this proposal? No

### **Helped with proposal development:**

Are there persons who helped with proposal development?

No

### **Comments:**

# Budget Summary

## Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts

Please provide a detailed budget for each year of requested funds, indicating on the form whether the indirect costs are based on the Federal overhead rate, State overhead rate, or are independent of fund source.

### Independent of Fund Source

Year 1												
Task No.	Task Description	Direct Labor Hours	Salary (per year)	Benefits (per year)	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
1.1	Establish workgroup and coordinate project activities	180	14040	360	750	500	0	0	0	15650.0	0	15650.00
1.2	Compile background information	56	3608	112	200	500	0	0	0	4420.0	0	4420.00
1.3	Conduct biological assessment	360	28120	680	500	500	8000	0	0	37800.0	0	37800.00
2.1	Document physical conditions and recommend alternatives to reduce interim losses of juvenile salmonids	88	7424	176	200	200	4000	0	0	12000.0	0	12000.00
2.2	Prepare environmental documents	196	15108	392	200	400	4000	0	0	20100.0	0	20100.00
2.3	Conduct fish sampling	340	18640	460	1500	2000	0	0	0	22600.0	0	22600.00
		1220	86940.00	2180.00	3350.00	4100.00	16000.00	0.00	0.00	112570.00	0.00	112570.00

<b>Year 2</b>												
<b>Task No.</b>	<b>Task Description</b>	<b>Direct Labor Hours</b>	<b>Salary (per year)</b>	<b>Benefits (per year)</b>	<b>Travel</b>	<b>Supplies &amp; Expendables</b>	<b>Services or Consultants</b>	<b>Equipment</b>	<b>Other Direct Costs</b>	<b>Total Direct Costs</b>	<b>Indirect Costs</b>	<b>Total Cost</b>
1.1	Coordinate project activities	180	14040	360	750	500	0	0	0	15650.0	0	15650.00
2.2	Prepare environmental documents	58	3984	116	0	0	0	0	0	4100.0	0	4100.00
2.3	Conduct fish sampling	340	18640	460	1500	500	0	0	0	21100.0	0	21100.00
2.4	Modify diversion channel to reduce losses of salmonids	38	3774	76	200	0	0	0	15000	19050.0	0	19050.00
3.1	Hydraulic, geological and fluvial geomorphological surveys	80	6440	160	0	0	66350	0	0	72950.0	0	72950.00
3.2	Conduct financial analysis of proposed alternatives	90	7670	180	0	0	56350	0	0	64200.0	0	64200.00
3.3	Recommend positive barrier screen type and location	90	7670	180	0	0	52300	0	0	60150.0	0	60150.00
		876	62218.00	1532.00	2450.00	1000.00	175000.00	0.00	15000.00	257200.00	0.00	257200.00

<b>Year 3</b>												
<b>Task No.</b>	<b>Task Description</b>	<b>Direct Labor Hours</b>	<b>Salary (per year)</b>	<b>Benefits (per year)</b>	<b>Travel</b>	<b>Supplies &amp; Expendables</b>	<b>Services or Consultants</b>	<b>Equipment</b>	<b>Other Direct Costs</b>	<b>Total Direct Costs</b>	<b>Indirect Costs</b>	<b>Total Cost</b>
1.1	Coordinate project activities	180	14040	360	750	500	0	0	0	15650.0	0	15650.00
2.3	Conduct fish sampling	340	18640	460	1500	500	0	0	0	21100.0	0	21100.00
		520	32680.00	820.00	2250.00	1000.00	0.00	0.00	0.00	36750.00	0.00	36750.00

**Grand Total=406520.00**

**Comments.**

# Budget Justification

## Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts

**Direct Labor Hours.** Provide estimated hours proposed for each individual.

Total labor hours for SPCA's employee categories are as follows: Technician 700 Biologist I 280 Biologist II 558 Biologist III 958 Senior Consultant 120 The per-task breakdown of hours is as follows: Task 1.1: Bio I 60, Bio II 240, Bio III 240 Task 1.2: Bio I 40, Bio II 8, Bio III 8 Task 1.3: Tech 40, Bio I 80, Bio II 80, Bio III 100, Senior Consultant 60 Task 2.1: Bio II 40, Bio III 40, Senior Consultant 8 Task 2.2: Bio I 100, Bio II 70, Bio III 60, Senior Consultant 24 Task 2.3: Tech 660, Bio III 360 Task 2.4: Bio III 30, Senior Consultant 8 Task 3.1: Bio II 40, Bio III 40 Task 3.2: Bio II 40, Bio III 40, Senior Consultant 10 Task 3.3: Bio II 40, Bio III 40, Senior Consultant 10

**Salary.** Provide estimated rate of compensation proposed for each individual.

The amounts listed for salary are SPCA's billing rates minus the benefit rates listed below. The billing rates include actual pay rates plus all overhead for each category of employee for each hour worked. Besides the employee pay and benefits, the billing rate includes costs associated with operation of the company such as Project administration (invoicing, payroll, et.), office rental, electricity, basic phone charges, internet connections, copy machine rental, employee taxes, company insurance for office and equipment, office supplies and furniture, salary employee bonuses, all overhead associated with each employee (disability insurance, workman's comp, vacation pay, holiday pay, etc.), company truck lease, etc. The following rates apply to the each category of employee listed in the project: Technicians \$34/hr Bio I \$58/hr Bio II \$68/hr Bio III \$93/hr Senior Consultant \$108/hr The actual employee pay is approximately 45% of the above billing rates plus the benefits listed below.

**Benefits.** Provide the overall benefit rate applicable to each category of employee proposed in the project.

Technicians receive \$1/hr for insurance and all other categories receive \$2/hr for insurance.

**Travel.** Provide purpose and estimate costs for all non-local travel.

Travel is estimated to cost \$8,050 over the 3-year project period. This includes mileage and lodging paid to out-of-town employees attending workgroup and site meetings. Also included here are airfare and car rental costs for SPCA's out-of-state senior consultant.

**Supplies & Expendables.** Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Supplies and expendables are expected to cost approximately \$6,100 for the project period. This total can be broken down as follows: Field supplies: \$2,500 for fish sampling supplies including nets, waders, boots, boat fuel and supplies, waterproof paper, headlamps, thermometers, sample containers, etc. Office supplies: \$720 for report creation supplies, copies, binders for data sheet storage, etc. Communication: \$80/month= \$2,880 for long-distance calls and field crew phones

**Services or Consultants.** Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Consultant services have been estimated to be \$191,000. This includes \$16,000 in Year 1 for assistance with preparing environmental documents (\$4,000), assistance with evaluation of screening facilities (\$4,000) and assistance with conducting of a biological assessment (\$8,000). The remainder will be used in Year 2 for stream surveys (\$66,350), financial analyses (\$56,350) and recommendations of fish screening types and feasibility (\$52,300).

**Equipment.** Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

None

**Project Management.** Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

The Project Management aspects are incorporated into each of the tasks by Bio II and III. Reports and presentations are presented as tasks in the project. The cost to administer the contract is included in the billing rates.

**Other Direct Costs.** Provide any other direct costs not already covered.

Other direct costs will total \$15,000, which will be used for diversion channel modifications in Task 2.4.

**Indirect Costs.** Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs.

All indirect costs are included in the billing rates and are explained in detail above under salaries. The billing rates include salary + benefits.

## **Executive Summary**

### **Fish Screen Feasibility and Interim Fish Protection Measures for Diversion Facilities of the South Yuba and Brophy Water Districts**

The purpose of this project is to identify and perform interim measures to reduce losses of juvenile salmonids at the South Yuba-Brophy diversion facilities while conducting a feasibility study for the permanent addition of a positive barrier fish screen at the facilities. Previous fisheries studies have indicated significant loss of juvenile salmonids occurs at agricultural diversions in the Central Valley. Based on these studies and the testimony of USFWS, NMFS, and CDFG, the State Water Resources Control Board (SWRCB) adopted Water Right Decision 1644 in March 2001. Decision 1644 directs the South Yuba and Brophy Water Districts (South Yuba-Brophy) to consult with the USFWS, NMFS, and CDFG and develop a plan to reduce losses of juvenile salmonids associated with the South Canal diversion facilities. South Yuba-Brophy maintains that the best available evidence indicates that the current gabion is an effective fish barrier, but initiates this process to conform with stated policy of the agencies to replace the existing rock gabion in favor of a positive barrier fish screen. This project is located on the Yuba River (river mile 11) near Marysville, California. This three-year project will establish a technical working group to help ensure that all activities and recommendations are consensus based, so that the final work products will be accepted by both agency and private parties. Project objectives include (1) establish project coordination, implementation, and communication components, (2) identify and implement interim measures to reduce juvenile salmonid losses associated with the current South Yuba-Brophy diversion facilities, and (3) determine feasibility of installing a positive barrier fish screen that meets current NMFS fish screen criteria (NMFS 1997) at the diversion facility. The products of this project include: recommendation of positive barrier fish screen type and placement; detailed analysis of costs to design, construct, and maintain proposed screen; and interim reduction of salmonid losses at existing facilities during the feasibility study.

# **Proposal**

**S.P. Cramer & Associates, Inc.**

**Fish Screen Feasibility and Interim Fish Protection Measures for Diversion  
Facilities of the South Yuba and Brophy Water Districts**

Doug Demko, S.P. Cramer & Associates, Inc.



**Fish Screen Feasibility Study and Interim Fish Protection Measures  
for Diversion Facilities of the  
South Yuba and Brophy Water Districts**

**A. PROJECT DESCRIPTION**

**1. PROBLEM**

The South Yuba-Brophy diversion headworks are located above Daguerra Point Dam on the Yuba River, adjacent to the Yuba Goldfields, roughly 9 miles northeast of Marysville, California (Figure 1). The diversion headworks consist of an intake and bypass channel (collectively called the diversion channel), a rock gabion that prevents fish entrainment into the irrigation system, a diversion pond behind the gabion, and an irrigation canal exiting the diversion pond (Figure 2). Water flows from the mainstem of the Yuba River into the intake channel where it percolates through the gabion into the diversion pond. The gabion consists of cobble size rock, is roughly 300 ft long, and ranges in width from roughly 30 ft at the base to 10 ft at the top. A fine meshed screen was placed a few feet inside the river-side of the gabion at construction to prevent juvenile salmonids from passing through.

Some of the water that enters the intake channel remains in the channel as it passes the gabion and flows back to the Yuba River through the bypass channel. The bypass channel extends roughly 200 ft from the downstream end of the gabion to the river, just upstream of the Daguerra Point Dam.

In recent years, resource agencies have expressed concern that the diversion facilities are not as effective at minimizing fish loss as originally intended. Agency personnel have raised questions about the effectiveness of the rock gabion in preventing fish losses, as well as questions about the effects of the pond in front of the gabion and the return channel on fish survival. Although there is little data to suggest the South Yuba-Brophy gabion is ineffective, resource agency testimony before the SWRCB in 1992 suggested that similar rock gabions elsewhere have been proven ineffective. In 2000, a NMFS biologist testified that the rock levee at South Yuba-Brophy diversion does not meet NMFS screening criteria.

Two major concerns have been expressed, and a SWRCB decision (1644) requires that both concerns be addressed in the form of improvements to reduce fish losses at the diversion. The first concern is entrainment of fish through the gabion, since juvenile salmon were found in the pond behind the gabion and juvenile trout were captured in a fyke net at the head of the irrigation canal. Due to the large size of the juvenile salmon captured and known overtopping of the gabion during flood events, it's probable that the juvenile salmon entered the diversion pond during high water. However, due to the small size of trout captured, it is uncertain whether they were entrained through the gabion or produced in the diversion pond. Regardless, Decision 1644 requires that a plan be prepared and presented to SWRCB to reduce fish losses by March 31, 2002.

The second concern is juvenile salmonid mortality and disorientation in front of the gabion. Decision 1644 cites evidence that the wide, deep pond in front of the structure reduces water velocity,

results in increased water temperatures, disorients juvenile salmon and delays their downstream migration. Although the original engineering plans specified a relatively straight bypass channel, the existing channel is curved and varies significantly in width and depth. There is also considerable vegetation along the banks of the channel, some of which has degraded the quality of the banks and provides instream and surface cover for predators. Since the entire diversion channel consists of gravel and cobble, which is in abundant supply in the area, modifications to the channel could easily be conducted to increase velocities and provide more consistent and uniform flows. These changes would logically reduce predation and decrease juvenile salmonid travel time through the channel.

Although local fishery agency representatives have stated that the existing rock gabion needs to be replaced with a state-of-the-art fish screen which meets current NMFS criteria, several significant problems need to be addressed prior to the design or construction of a new screen. If these problems are not adequately addressed over the next three years, substantial delays in future design and construction could result. Some of the unresolved issues this project will resolve include:

- < What type of screen should be constructed? Currently, many different screening options are approved for use by NMFS, and suitability of one type over others usually depends on the physical and biological attributes of a particular site. Detailed analyses of many issues are necessary to determine the most suitable screen type for this particular location.
- < Where should a new screen be located? The existing rock gabion is located on a bypass channel, not on the Yuba River, and the site may not be geologically suitable for a fish screen. Therefore, the existing site needs to be evaluated for geological suitability. Other alternative sites need to be identified and evaluated as well. Other sites may provide more protection from flood damage, which is a significant concern for South Yuba-Brophy.
- < What are the costs associated with the design, construction, and operation of a new screen? Since South Yuba-Brophy will need to demonstrate the cost-benefit of a future screening project to obtain public funds for construction, analyses need to be conducted to determine the most cost-effective solution for the site. Ongoing maintenance costs are also a concern and demonstration of minimal ongoing operating costs could facilitate Board approval of future plans.
- < What are the expected benefits to juvenile salmonids from a new screen? In order to obtain funds for the construction of a new screen, justification for the project in the form of expected benefits to salmonids needs to be addressed. Demonstration of the expected benefits to salmonids from a new screen will help South Yuba-Brophy obtain funds for future phases by providing funding sources with the data necessary to prioritize the project. High priority ranking of a screen project would help guarantee funding from public sources and approval of the necessary environmental permits.
- < What environmental issues exist that may delay a new screen if not adequately addressed prior to design and construction? Significant environmental compliance is required for the design and construction of a fish screen, and these issues need to be identified well ahead of time to prevent

unnecessary delays. There are several issues specific to the area of the diversion, such as the fate of Daguerre Point Dam, and possible Mercury contamination in the sediment behind the dam, that need to be resolved prior to making final decisions on the screen. Project tasks and time-lines for completion allow for the natural resolution of these issues, which are currently being studied, and for their incorporation into our analyses.

- < How can losses to juvenile salmonids be reduced in the interim period? Recognizing that the resolution of these issues and design and construction of a new screen will take several years, and that SWRCB Decision 1644 directs South Yuba-Brophy to take steps to reduce interim losses to juvenile salmonids, this project will quickly determine what actions are necessary to reduce losses and implement them. Completing this task early in the project period will ensure that maximum benefits of the actions are realized. This action will also guarantee that steps are taken to protect salmonids in the event of future delays. For example, if Mercury concentrations are determined to be high in the diversion area, construction of a new screen could be delayed due to the challenges associated with disturbing the sediment. Law suits from environmentalists relating to the Mercury contamination could also delay progress.

The objectives and associated tasks presented in this proposal are intended to answer the above questions in a methodical, comprehensive process over the three year project period. The proposed project schedule is consistent with the need for information from outside studies currently underway, such as the fate of Daguerre Point Dam and possible Mercury contamination. The tasks also ensure that the necessary data and information will be available for South Yuba-Brophy to apply for, and receive, future grants of public moneys and environmental permits.



Figure 1. Map of Yuba River showing approximate location of the Yuba South-Brophy diversion headworks.

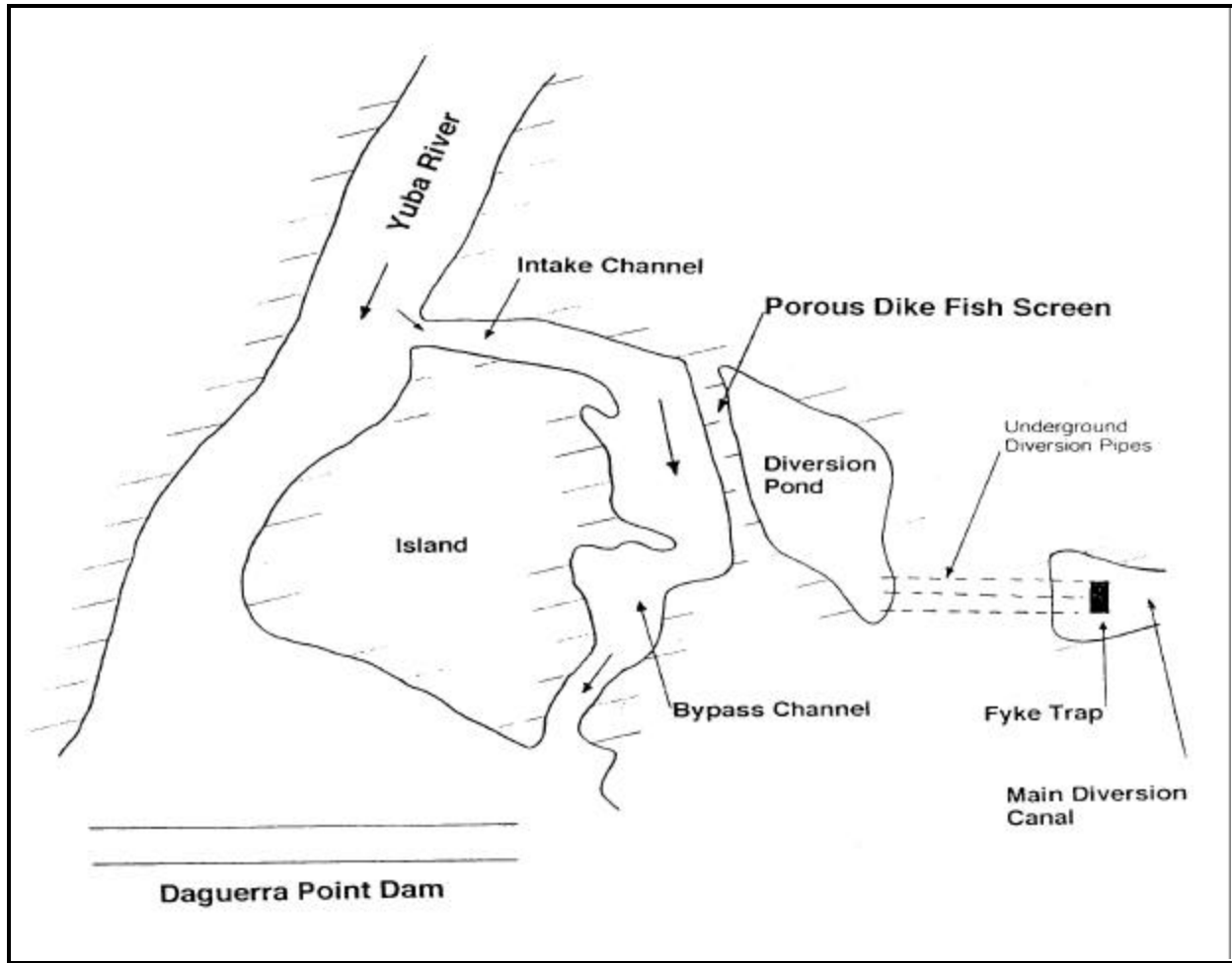


Figure 2. Schematic diagram of South Yuba-Brophy diversion facilities.

## 2. JUSTIFICATION

Diversion facilities within the Central Valley are presumed to be a significant source of juvenile salmonid mortality (CALFED 2001). Measures to reduce salmonid losses are an important component of the ERP in the Sacramento River and its tributaries. In the Yuba River, the recent listings of Central Valley steelhead under the federal Endangered Species Act (ESA), and Central Valley spring-run chinook under both the state and federal ESA's, increase the importance of minimizing entrainment losses associated with the South Canal diversion facilities. In addition, NMFS recently issued a final ESA Section 4(d) rule that governs the take of Central Valley steelhead. This rule defines "constructing or operating dams or water diversion structures with inadequate fish screens or fish passage facilities in a listed species habitat" as an activity that is likely to result in take of the listed species and is subject to the take prohibitions of Section 9. Furthermore, recent testimony and evidence presented by the USFWS, NMFS, and CDFG led the SWRCB to conclude in Water Right Decision 1644 (March 2001) that:

to continue diversions at the South Canal without taking actions to reduce fish loss would be an

unreasonable method...(and) may also violate the ESA section 4(d) rule governing the take of steelhead....therefore, ....Brophy, South Yuba should consult with NMFS, USFWS, and DFG to develop a plan to reduce fish losses.

This plan must be provided to the Chief of the Division of Water Rights by March 31, 2002. As a result of responsibilities regarding the ESA and D-1644, South Yuba-Brophy recognize the need for increased salmonid protection at the diversion facilities and commit to providing interim measures that will reduce juvenile losses until a permanent solution is developed. Accordingly, a suitable fish screen installed at the diversion facilities will presumably provide long-term benefits for the Yuba River fishery by minimizing the loss of juvenile salmonids.

We expect the outcome from this assessment to address facility improvements and fish passage problems as identified by Restoration Priority SR-2 and SR-6 of CALFED's Ecosystem Restoration Program (ERP), by Monitoring Element No. 4 of CALFED's Comprehensive Monitoring Assessment and Research Program (CMARP), by the Central Valley Project Improvement Act's (CVPIA) Anadromous Fish Screen Program, and by section 3406(b)(16) of the CVPIA's PEIS.

### **3. APPROACH**

**Objective 1: Provide forum and technical expertise to guide all project components, compile information, and prepare environmental documents necessary for project completion.**

*Task 1.1 Establish South Yuba-Brophy fish screen feasibility study workgroup and perform project coordination, implementation, and communication components for the three year project period.*

The purpose of this project is to identify and perform interim measures to reduce losses of juvenile salmonids at the South Yuba-Brophy diversion facilities while conducting a feasibility study for the permanent addition of a positive barrier fish screen at the facilities. Due to potential future management applications, this project will be conducted as a cooperative effort and will utilize the expertise of government and private biologists. Therefore, a technical workgroup will be established to oversee interim fish passage improvements and the development of a comprehensive fish screen feasibility study at the South Yuba-Brophy diversion facilities. The technical workgroup will meet quarterly to provide regular review and oversight of activities and will serve as advisors to facilitate project implementation and expedite information transfer into management applications. The technical working group will include a facilitator and representative biologists from CDFG, NMFS, USBR, USFWS, and the irrigation districts.

In addition to the development of a workgroup, we will strive to keep everyone informed of the status of the project on a real-time basis. We will distribute regular project updates, including meeting notes, field progress reports, data summaries, and other written communication on a monthly basis. All work products will be posted on the internet for public access and review.

*Task 1.2      Compile background information, documents, and data which will be needed for future tasks, permits, field work, and analyses.*

This task will gather information needed for all project objectives. We will gather existing studies and reports on the Yuba River's fluvial geomorphology to obtain a general understanding of the river and its processes. We will compile information on historical Yuba River flows, sediment transportation, geology, irrigation diversion, and salmon and steelhead run timing. Much of this information has already been compiled for other Yuba River projects, in which case it will be easily located. Other information may be more difficult to locate and may require examination of historical agency records, or library and internet searches. During this process we will compile a reference database of all relevant data and reports.

*Task 1.3      Conduct Biological Assessment for biological resources in project area to determine the potential effects of interim measures to reduce fish losses (Objective 2) and the feasibility of constructing a positive barrier fish screen (Objective 3).*

At the initiation of the project we will conduct a Biological Assessment to determine the environmental effects of the proposed project tasks and screen construction on the natural habitat within the Yuba River, and in the immediate vicinity of the South Yuba-Brophy diversion headworks. The Biological Assessment will include the potential impacts of all activities that may occur during the completion of Objective 2, including: sampling at the head of the irrigation canal; modifications to the intake and bypass channels, including the pond in front of the rock gabion; and predator surveys in the intake and bypass channels. The Biological Assessment will also include the potential impacts of all activities that may occur during the construction of a positive barrier fish screen, including the potential harmful effects to plants and animals during the construction of a fish screen, and how impacts could be minimized by the location or type of screen constructed.

The Biological Assessment will include a survey of the project area for threatened or endangered plants and animals, and will include a literature review and field surveys. The assessment will identify any potential fatal flaws from an environmental perspective, including those that would cause substantial delays in each aspect of the project, or cause any aspect of the project to be infeasible. The Biological Assessment will be used in preparing the environmental documentation to meet the requirements of the California Environmental Quality Act (CEQA), and the National Environmental Policy Act (NEPA) in possible future phases of the project (final engineering design and environmental documentation).

Since permitting issues for Objective 2 may rely on the completion of the Biological Assessment, we will begin working on it as soon as the contract is awarded and funds are available. We will begin working on the aspects which will be most important for the completion of various sampling permits, such that the permits can be completed prior to the completion of the Biological Assessment.

**Objective 2: Estimate the fishery benefits of a new fish screen and identify and implement interim measures to reduce fish losses associated with the South Yuba-Brophy diversion facilities, as per SWRCB Decision 1644.**

The construction of the rock gabion resulted in a wide, deep pool immediately in front of the rock barrier, which, according to SWRCD Decision 1644, "reduces the water velocity in the bypass channel which disorients juvenile salmon and delays their downstream migration. The pool also results in increased water temperature that is detrimental to salmon, and in increased fish mortality due to predation in front of the rock levee fish screen." Objective 2 and its four tasks will help identify sources of losses to salmon and trout in the intake and bypass channels (diversion channel), perform the necessary channel modifications to reduce those losses, and document the physical and biological conditions prior to and after the modifications. The timing of these tasks will be such that the maximum information and benefits will be gained in the relatively short project period (3 years). The predator and entrainment sampling will be designed to reduce costs to the extent possible.

The completion of this objective is necessary to (1) comply with SWRCB Decision 1644, (2) provide the data and information necessary to estimate the benefits to salmonids to aid in the prioritization of restoration actions (i.e. screen construction) during the process of obtaining public funds, (3) ensure that adequate interim measures are taken to reduce losses to juvenile salmonids during design and construction of a screen, or during unexpected delays, and (4) provide the necessary monitoring component to establish baseline information to judge the effectiveness of future actions.

*Task 2.1 Survey and map diversion channel to document physical conditions and identify potential sources of losses, and recommend alternatives to reduce interim losses of juvenile salmonids.*

We will survey existing flow and channel conditions within the South Yuba-Brophy diversion channel and develop a plan detailing interim channel modifications to reduce losses of chinook and steelhead. Detailed cross-sectional measurements will be made at frequent intervals along the length of the diversion channel. Measurements will be made such that a three dimensional computer model of the can be generated and used to document conditions prior to and after modifications. The detailed measurements will also allow us to estimate the amount of fill that will be required for the improvements, the time it will take to make the improvements, and how much it will cost. This will necessary to obtain the permits required for the work.

A brief technical report will be prepared that includes a description of existing conditions, including a detailed physical accounting of the diversion channel with graphics of current channel dimensions and hydraulics, and recommendations for interim modifications that will reduce juvenile salmonid losses. The report will be reviewed by the workgroup and serve as the basis for determining the exact channel modifications to reduce juvenile losses (Task 2.4).

*Task 2.2 Prepare environmental documents and obtain environmental permits and authorizations to implement interim diversion facility modifications.*

We will prepare all environmental compliance documents necessary to implement the interim diversion facility modifications using the work completed in Task 1.3 (Biological Assessment) and Task 2.1 (channel measurements and modification plan). The documents will be prepared according to California



Environmental Quality Act (CEQA) guidelines and will be used to consult with appropriate agencies to obtain any necessary environmental permits or authorizations such as federal and state Endangered Species Act, State Water Resources Control Board, State Reclamation Board, CDFG streambed alteration, and Yuba County floodplain encroachment. The documents and supporting material needed to complete this task will be completed at the beginning of the project such that the channel modifications can be made during the second year of the three year project, and thus at least several years of benefits would be realized from the improved passage conditions.

To maximize the benefits of the channel modifications it will be necessary to obtain the environmental permits within the first 16-18 months of the project. Therefore, we will rely on our productive relationships with agency personnel and trust established in the workgroup to ensure that the necessary permits are efficiently identified and obtained.

*Task 2.3 Conduct fish sampling prior to and after channel modifications to document species composition, relative abundance, habitat preferences, and entrainment into the irrigation canal.*

The purpose of this task is to document predator abundance and habitat use in the diversion channel prior to the channel modifications, which will provide us the information necessary to conduct the appropriate channel modifications. Sampling before and after channel modifications will also enable us to document changes to predator populations resulting from the channel modifications, to be sure the improvements had beneficial effects. This information is also necessary to establish baseline conditions and demonstrate the potential benefits of the proposed screen for future project prioritization and funding purposes. To accomplish this task we will conduct snorkel surveys in the diversion channel and sample with a fyke net at the head of the irrigation canal. Sampling at the head of the irrigation canal may allow us to further demonstrate the positive effects of the channel modifications by comparing entrainment rates before and after the changes, and will provide baseline data which can be compared to data collected after the construction of a screen, also to demonstrate beneficial project effects.

We will sample at the head of the irrigation canal at the beginning of each irrigation season to document fish presence in the pond and entrainment through the gabion. Sampling will only occur during the first three weeks of each irrigation season, which should be enough time for fish to evacuate the pond behind the rock gabion, if they are present, and provide a snapshot evaluation of entrainment during the first part of the irrigation season, when fish are small and more susceptible to entrainment. A similar apparatus to the one used in 1993 will be used to catch fish as they enter the canal. The net will be checked at least once per day and will be of a size sufficient to catch salmonid fry. At least one net efficiency test will be completed with fry to test the capture efficiency of the net. Only a total of 9 weeks of sampling effort will be devoted to this task over the three year project period, such that the cost of the sampling is relatively small in proportion to the overall feasibility study.

Predator composition, relative abundance, and habitat use in the diversion channel will be determined by regular snorkel surveys conducted in the entire diversion channel each month of the three

year project. Regular and frequent snorkel surveys will allow us to more accurately determine predator abundance and habitat use before and after channel modifications, since a time series of several years pre and post project will not be possible. The snorkel surveys prior to the channel modification will ensure that we understand what predator species are present, when they're present, and what habitats they use in the diversion channel. This information will allow us to design channel modifications which target specific predators and their habitats, thus maximizing the effectiveness of the modifications. The post modification surveys will ensure that the modifications had the desired effects.

*Task 2.4      Modify diversion channel to reduce interim losses of juvenile salmonids during the fish screen feasibility study and subsequent phases.*

The feasibility study, design, and construction of new facilities could take many years, thus there is a need to reduce interim losses of juvenile salmonids. Based on the results of our predator surveys (Task 2.3), and detailed physical dimension and flow measurements (Task 2.1), we will modify the diversion channel to improve passage conditions for juvenile salmonid migration through the channel as directed by SWRCB Decision 1644. Interim modifications will be designed to decrease travel time through the diversion channel to help reduce predation, and will be conducted in cooperation with the technical workgroup. Snorkel surveys will determine the species of predators and their preferred habitats in the diversion channel. The Biological Assessment prepared under Task 1.2 will identify any potential impacts that need to be addressed prior to the channel modifications, including the species potentially effected and the necessary permits. The Biological Assessment will also evaluate the timing of the modifications, such that potential impacts to threatened, endangered, and sensitive species will be minimized. The potential to circumvent permitting processes by the timing of the channel modifications will also be investigated. Clean-fill and other state-of-the-art techniques will be investigated to reduce potential impacts to other species, reduce permitting processes, and help ensure that the necessary modifications can be completed during the second year of the project. It is important to complete the modifications during the second year to maximize the benefits of the passage improvements.

Prior to any channel modification we will obtain workgroup consensus of the plan prepared under Task 2.1, and obtain all necessary environmental documents for the work. South Yuba-Brophy, as matching funds, will supply the labor and equipment needed to perform the necessary modifications.

**Objective 3: Determine an appropriate positive barrier fish screen type and location for the South Yuba-Brophy diversion facilities.**

In conjunction with the completion of the other two objectives outlined in this study plan, the primary work product of Objective 3 is a recommendation of a positive barrier fish screen that meets current NMFS and CDFG screening criteria. The recommendation will include placement of the screen based on the fluvial and geologic conditions of the area. The screen type and location recommendation will be based on the results of all objectives, and will take into consideration the costs to design, construct, and maintain the fish screen. Although the primary product will be the recommendation of a positive barrier fish screen, other screen alternatives may also be discussed, but will be very limited in scope and will not be the focus of this objective, or this project.

*Task 3.1 Conduct hydraulic, geological and fluvial geomorphological analyses of current gabion location and of surrounding area to evaluate different screening technologies and alternatives for the South Yuba-Brophy diversion.*

The primary focus of this task will be on screening technologies and alternatives which meet current NMFS and CDFG criteria. Existing reports and data on the Yuba River's fluvial geomorphology will be gathered to obtain a general understanding of the river and its processes. This will include a meeting with stakeholders in the area to ensure the search is complete and concerns about the project are documented. A report will be prepared to summarize the data findings and provide a plan for collecting other data if necessary.

The area will need to be surveyed to obtain geo-technical data for determining fish screen alternatives. A thorough understanding of the physical conditions relating to the design and construction of a positive barrier fish screen is imperative to identifying the most appropriate design. Hydraulic, geological, and fluvial geomorphological surveys, and analyses of current diversion facilities and the surrounding river area will be conducted to determine the feasibility of constructing a fish screen at the location of the existing gabion or in the surrounding area. Different screening technologies will be examined along with their location and relative suitability, or ability to meet CDFG and NMFS screening criteria. Recommendations for the location of the alternative or modified positive barrier fish screen will be made.

*Task 3.2 Conduct financial analysis of proposed screen alternatives.*

Of primary concern to South Yuba-Brophy is the cost to design, construct, and maintain a positive barrier fish screen. Damage resulting from a flood or other disaster could render the districts insolvent and unable to pay for repairs and unable to divert water. Although public funds might be available to design and construct a fish screen, no such funds are available for maintenance and repairs. Due to the potential seriousness of this financial burden, a thorough analysis will be completed to evaluate the long-term operating costs for different screen alternatives.

After the geotechnical, topographical, and fluvial geomorphological data collection is completed and the design criteria has been established, conceptual design of alternative screen facilities will be developed. A cost estimate will be developed for each alternative and include engineering design, construction, and operation and maintenance costs.

*Task 3.3 Select most appropriate positive barrier screen type and location based on findings of previous work.*

Based on the findings of field surveys and cost analyses, the most appropriate screen type and location will be identified and described in a final feasibility report prepared by Montgomery Watson Harza (MWH). The final recommendation for the appropriate fish screen and location will be made by MWH, the entity conducting the analyses under Objective 3. MWH will strive to ensure that the recommendation is approved by all interested parties keeping in mind that South Yuba-Brophy will ultimately be responsible for the fish screens operation and maintenance costs. In the event the interested parties are unable to reach

a consensus on the type and location for a positive barrier screen, the reasoning for the lack of consensus will be extensively documented, and MWH will be responsible for providing their final recommendation, including justification for their decision. The primary recommendation will not be anything other than a positive barrier fish screen that meets current NMFS and CDFG screening criteria. Other alternatives may be discussed, but will not be the primary focus of Objective 3.

#### **4. FEASIBILITY**

This project will be conducted by S.P. Cramer and Associates, Inc. (SPCA), and Montgomery Watson Harza (MWH). SPCA will be responsible for the project management and deliverables, but will subcontract many tasks and activities to MWH. MWH is proposed by SPCA due to their reputation and extensive experience with fish screen design. The combined fisheries experience in the basin and fish screen knowledge will ensure that the project is completed within the scheduled time and meets or exceeds professional expectations.

The objectives and associated tasks that are to be met and completed through this project will easily be accommodated in a three-year work schedule, as they do not rely on the completion of any other project, nor are there any project opponents as no negative impacts are anticipated. This project is composed of tasks that are about 60% administrative in nature. The administrative duties will be completed through cooperative meetings between private and agency biologists and others, research and compilation of historical information, consultation with agency permitting representatives, preparation of environmental compliance agreements and permit applications, and conducting of financial analyses. These steps are not only appropriate, but fundamental during the initial feasibility and planning stages of any successful fish screen or passage program.

The remaining 40% of the tasks described above require minimal to substantial field work, data analysis, and report composition. Some tasks under objectives 2 and 3 involve the conducting of surveys detailing environmental conditions surrounding the diversion facility in question. Task 2.3 also involves environmental surveying and will require that Scientific Collecting Permits be obtained by field personnel participating in fish sampling surveys. Technicians and biologists from SPCA will conduct necessary fish sampling. Collection permits are possessed and kept current by all SPCA employees. Task 2.4 consists of making physical modifications to the existing diversion facility. The modifications necessary to reduce juvenile salmonid loss through the facility will be identified during Tasks 2.1 and 2.2 and will be assessed for environmental compliance requirements prior to their initiation. Depending on survey findings, the following permits or agreements may be necessary: DFG 1601/1603 notification; CWA 401 and 404 certification; Yuba County floodplain encroachment approval; Reclamation Board approval; ESA Section 7 consultation.

The feasibility of this work has also been shown in similar projects (M&T/Parrott Pumping Station and Fish Screen, 1998; White River Fish Screen Project Planning and Design, 1997). The feasibility study will provide necessary information to show the impacts of the project and how the facilities can be constructed. To proceed with the tasks described, several permits may be necessary. Table 1 lists the various agencies with applicable permit requirements.

Table 1. Possible permits and authorizations required.

Agency/Permit	Applicability	Requirements for Application
U.S. Army Corps of Engineers Section 404 Nationwide and Section 7 Individual Permits	Required when working in natural streams and rivers	<ul style="list-style-type: none"> <li>- Site Plan and Section Drawings</li> <li>- Location Map</li> <li>- CVRWQCB Sect. 401 Water Quality Certification (may be done concurrently)</li> <li>- COE Application 4345 Environmental Documentation</li> </ul>
Central Valley Regional Water Quality Control Board Section 401 Water Quality Certification	Required when working in natural streams and rivers if the construction area is less than 5 acres	<ul style="list-style-type: none"> <li>- CEQA Certification</li> <li>- Application Form and Fee</li> <li>- Section 1600 Stream Alteration Agreement or note contact with CDFG</li> <li>- Copy of COE Application 4345</li> </ul>
California Department of Fish and Game Section 1600 Stream Alteration Permit	Required when natural streambed is to be altered by construction	<ul style="list-style-type: none"> <li>- Environmental Documentation</li> <li>- Application Form and Fee</li> <li>- Project Location Map</li> <li>- Site Plan</li> </ul>
State Historic Preservation Officer (SHPO) and National Historic Preservation Section 106 Coordination	Required for construction	<ul style="list-style-type: none"> <li>- Archeological Inventory Survey and Report</li> </ul>
California Endangered Species Act (CESA) Consultation	Required for construction	<ul style="list-style-type: none"> <li>- State lead agency designated</li> <li>- Threatened and endangered biological review</li> </ul>
Endangered Species Act (ESA) Compliance	Required for construction	<ul style="list-style-type: none"> <li>- Federal lead agency designated</li> <li>- Site Visit</li> <li>- Threatened and endangered biological review</li> </ul>
National Environmental Policy Act (NEPA) Compliance	Required for construction	<ul style="list-style-type: none"> <li>- Federal lead agency designated</li> <li>- Prepare draft environmental assessment</li> <li>- Prepare EIS or FONSI</li> </ul>
California Environmental Quality Act (CEQA)	Required for construction	<ul style="list-style-type: none"> <li>- State lead agency designated</li> <li>- Prepare initial study</li> <li>- Prepare Negative Declaration or EIR</li> </ul>

## 5. PERFORMANCE MEASURES

Measures of project success will be visible as complete reviews, reports, plans, and other documentation. Objective 1 performance measures include a functioning workgroup made up of members who regularly hold meetings to discuss project activities and help expedite the transfer of information into

management actions, as well as a fish screen feasibility study plan, and twelve quarterly project reviews. Objective 2 progress will be measured by the completion of a technical report detailing the physical, hydrological, and biological conditions surrounding project site, agency, water board, and local government permits and authorizations, and diversion facility modifications that improve fish passage conditions. The success of Objective 3 will be evident in the completion of geomorphological analyses of the current gabion location, which will lead to the identification of the final fish screen location, and a final fish screen plan for the diversion facilities.

## **6. DATA HANDLING AND STORAGE**

S.P. Cramer & Associates will gather publicly accessible background information, documents and data. When new data sets are encountered, these data will be integrated into the existing data whenever possible. Where field work is necessary, SPCA will use standard quality assurance and control (QA/QC) methods in designing sampling protocols and in obtaining, recording and analyzing data. All data will be recorded on field data sheets and/or field notebooks. Data will be entered into a database and error checked line-by-line against original data sheets prior to analysis. All original data sheets will be stored in a binder at SPCA's Central Valley office in Oakdale, and as a precautionary measure a copy will be stored at one of our California satellite offices.

Data collected by MWH will be handled and stored in their offices. Duplicate copies of data sheets, reports and electronic files will be provided to SPCA so a complete set of all project records may be maintained.

Once work is completed, all project files, including data, maps and other information will be stored at SPCA's Central Valley office. SPCA will submit all data required for public record to the appropriate party upon completion in a timely manner.

## **7. EXPECTED PRODUCTS/OUTCOMES**

This project is designed to result in a thorough understanding of the physical conditions relating to the design and construction of a positive barrier fish screen. Substantial physical work products will be produced during the three year project (Table 2). The project will identify a screen type and recommend a primary location for the construction, and prepare documentation for environmental permitting.

Table 2. List of physical work products produced over three year project period.

<u>Task</u>	<u>Product</u>
Task 1.1	Workgroup that guides all aspect of project
Task 1.2	Written Biological Assessment
Task 1.3	Document database
Task 2.1	Written description of diversion channel and recommendation to improve fish passage
Task 2.2	Environmental permits for channel modifications and sampling
Task 2.3	Written report detailing entrainment evaluation and predator surveys over three year period
Task 2.4	Modifications to diversion channel which will improve fish passage
Task 3.1	Written hydraulic, geologic, and fluvial analysis of diversion area
Task 3.2	Written summary of findings regarding costs to design, build, and operate different screening alternatives
Task 3.3	Written recommendation for type and location of positive barrier screen

Additional work products include:

1. Presentations as requested to inform and update CalFed committees, landowners, water user groups, and regulatory agencies about project progress and findings.
2. Quarterly reports detailing task accomplishments and fiscal expenditures to CalFed.
3. Reduction in losses of juvenile salmonids in the diversion channel during the completion of this feasibility study, and during subsequent design and construction of a fish screen.

## **8. WORK SCHEDULE**

The work schedule for the proposed project is presented in Table 3. All tasks will be completed within 3 years, from September 2002 through August 2005.





## **B. APPLICABILITY TO CALFED ERP AND SCIENCE PROGRAM GOALS AND IMPLEMENTATION PLAN AND CVPIA PRIORITIES**

### **1. ERP, SCIENCE PROGRAM AND CVPIA PRIORITIES**

#### ERP Strategic Goals

The proposed project targets 3 ERP strategic goals. First, the project will help to achieve recovery of at-risk species (Strategic Goal #1) by improving fish passage (Strategic Goal #4) at an existing facility. By improving fish passage, and in-turn survival, the project will help to maintain and enhance the chinook salmon and steelhead populations (Strategic Goal #3). Measures to increase survival are necessary for the populations to recover to sustainable levels sufficient for harvest.

#### Implementation Plan Priorities

The proposed project addresses implementation plan priority SR-2 by evaluating the feasibility of improving an existing facility. The Yuba River is one of seven streams in the Sacramento Region determined to have the most critical need.

#### CVPIA and AFRP Goals consistent with the ERP

Section 3402 states the purpose and goals of the CVPIA. The proposed project seeks to improve existing facilities to better protect, restore and enhance fish, wildlife and associated habitat in the Central Valley (section 3402(a)).

Under section 3406(b)(1) the CVPIA authorizes the Anadromous Fisheries Restoration Program (AFRP) to develop within 3 years of enactment and implement a program which makes all reasonable efforts to ensure that, by 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991. It is imperative to the success of the AFRP, that measures to increase survival are implemented. The proposed project seeks to increase survival by changing the type of fish barrier used an existing diversion facility.

Under section 3406(b)(21) the CVPIA authorizes the Anadromous Fish Screen Program (AFSP) to encourage and facilitate fish screen and other physical passageway facilities construction to avoid or minimize the entrainment and impingement of juvenile chinook salmon (all runs), steelhead trout, green and white sturgeon, American shad, and striped bass. Actions include rehabilitating or replacing existing fish screens below major dams. The proposed project meets the eligibility requirements of the AFSP and will help to achieve the goals of the program.

### **2. RELATIONSHIP TO OTHER ECOSYSTEM RESTORATION PROJECTS**

Fish screen and passage projects contribute to over 60% of the ERP funded projects in the

Sacramento Region totaling over \$80 million, which indicates there is a high level of implementability and benefits for these types of projects. According to the Draft Stage I Implementation Plan, most of the major diversions on the Sacramento mainstem have or are in the process of being screened, and many of the smaller diversions are screened as well. Therefore, the proposed project has numerous similarities with other ecosystem projects. In this year's PSP, the screening of the Hallwood-Cordua diversion was identified as an ERP priority (SJ-6), which is in the same general area as the diversion discussed in this proposal, but on the opposite bank. Therefore, the proposed project would complement the Hallwood-Cordua screen, if funded, and thus lessen entrainment on both sides of the lower Yuba River just upstream of Daguerre Point Dam.

### **3. REQUESTS FOR NEXT PHASE FUNDING**

This project is not the next phase of an existing ecosystem restoration project currently or previously funded by the CALFED Program or the CVPIA.

### **4. PREVIOUS RECIPIENTS OF CALFED PROGRAM OR CVPIA FUNDING**

S.P. Cramer and Associates received CVPIA funding (AFRP and B2) for juvenile salmon outmigrant sampling on the Stanislaus River at Caswell State Park from 1997 through 2001. Funding was also received from the AFRP in 1999 for an evaluation of the use of radio-tagged juvenile chinook salmon to identify cause and location of mortality, and from B2 in 1999 for an evaluation of smolt survival in the Stanislaus River.

### **5. SYSTEM-WIDE ECOSYSTEM BENEFITS**

There are numerous diversion facilities throughout the Central Valley, many of which pose significant threats to emigrating salmonids because they are unscreened or utilize out-dated screening technologies. The proposed project will provide system-wide benefits in that by reducing salmonid losses at the diversion facilities, survival of outmigrating salmonids will be increased. Increased survival may result in larger populations which will help managers reach recovery goals.

### **6. ADDITIONAL INFORMATION FOR PROPOSALS CONTAINING LAND ACQUISITION**

The proposed project will not require land acquisition.

### **C. QUALIFICATIONS**

This project will be a joint effort between SPCA and MWH. SPCA will be responsible for the project management and deliverables. All of objective three will be subcontracted by SPCA to MWH. SPCA and MWH will combine efforts on some of the other tasks to ensure professional results, on time, and on budget.

## Corporate Qualifications

**S.P. Cramer & Associates, Inc.** (SPCA) was established in 1987 to provide innovative problem solving on issues relating to salmon and trout on the Pacific Coast. We are reputed for our investigative work in determining why fish populations have or may change in response to specific actions. The core of the firm is composed of three Senior Fisheries Consultants, each with over 20 years of noteworthy experience. Our support staff includes a Biologist Project Leader, four Biologist Assistant Project Leaders, a Computer Applications Specialist, a Statistician, a Fisheries Facilities Engineer, a GIS specialist and a seasonal staff of 10 to 18 Fisheries Technicians.

SPCA has been conducting research within the Sacramento-San Joaquin Basin for public and private water rights holders, CAMP, and AFRP since 1990, and are therefore very familiar with basin issues, key watershed participants, and the actions necessary to conduct the proposed project. SPCA has conducted numerous fisheries investigations, monitoring and assessments in the Sacramento-San Joaquin basin. Past and on-going fisheries work include, but are not limited to annual monitoring of juvenile chinook outmigration, adult migrant trapping, radio tracking and electrofishing, analyses of hatchery contribution rates and a status review of west coast steelhead.

## Key Personnel Within SPCA

**Doug Demko**, a Fisheries Biologist and Juris Doctor, will manage and coordinate the proposed project activities within SPCA and between the cooperating parties, and will supervise field work, data analysis, interpretation and report preparation activities. Doug has worked in the Central Valley since 1990. He has led a variety of field sampling projects and has gained the respect of state and federal fisheries biologists as an expert in migrant fish sampling. His experience in the Sacramento-San Joaquin system is extensive, and includes leading research projects such as screw trapping, smolt survival studies, radio tracking, predator surveys, resident trout population estimates, habitat surveys, and limiting factors analyses. Additionally, he recently obtained a law degree which has furthered his understanding of water law and endangered species issues. The trust, respect and understanding of the issues he has gained by representing both stakeholders and the resource agencies, equips Doug with the skills to facilitate communication between diverse participants.

**Andrea Phillips** will coordinate and supervise field personnel and data collection activities and assist in data analysis and report preparation. Since 1995 she has assisted Doug in the coordination of field research activities on the Stanislaus River and other tributaries to the San Joaquin River which has required considerable networking and coordination with state, federal and local government personnel, private consultants, landowners and recreational groups.

**Steve Cramer** will provide knowledge and expertise to the interpretation of the data with his 27 years as a fisheries researcher and team leader. His first 13 years were invested with the Oregon Department of Fish and Wildlife directing major research programs on the Rogue and Columbia basins. Since founding SPCA in 1987, he has consulted for private firms, state and federal agencies, and Native American tribes. He has led numerous projects that pioneered new understanding and solutions for sustaining salmon and trout

populations in the western United States.

### Corporate Qualifications

**Montgomery Watson Harza**, MWH, is a full service civil and environmental engineering firm specializing in a variety of services including water and wastewater engineering, energy and infrastructure engineering, flood control, waste remediation, fisheries design, and environmental assessment and mitigation. The firm also works in a number of other industry sectors such as construction, finance, information technology, applied research, project management, laboratory services and government relations.

MWH - the result of a recent merger between Montgomery Watson and Harza Engineering Company, brings to the industry expertise in fish screen and water structure design and construction. With more than \$721 million in revenue, MWH has 5,500 specialists in more than thirty nations and more than 231 years of combined experience. MWH is successful in delivering progressive environmental solutions that reflect the latest scientific and technological developments while recognizing the importance of protecting the environment and the quality of life in local communities. MWH is a recognized leader in water resources and environmental planning. MWH has been present in Northern California for many years and continues to provide engineering service to many local private and public clients. The company has expertise and the capability to perform all phases of a project from the planning phase to the construction and operation of the completed project.

### Key Personnel Within MWH

**Neil W. Schild** is a Principal Engineer with 41 years of experience in operation and maintenance of dams and water supply reservoirs and power generation projects. He earned a B.S. in Agricultural Engineering from Kansas State University and is a Professional Agricultural Engineer in California. During 20 years with the U.S. Bureau of Reclamation, he has proven his ability to provide reasonable and practicable solutions to even the most complex situations. His background includes design and construction of fish protection facilities, application of environmental regulations, management of water and land resources, transfer of water rights, water resource planning, project management, and administration of personnel. Mr. Schild was Project Manager for M&T Chico Ranch Fish Screen Facility, Gorrill Land Company Fish Screen and Ladders Project, and Banta-Carbona Irrigation District Fish Screen Feasibility Study. He is currently the Project Manager for various Fish Screen Feasibility Studies in Northern California.

**Wayne C. Dahl** is a Principal Engineer with 23 years of experience in large civil engineering projects including planning, design, and construction management of water resources projects, including flood control and water supply. He received a B.S. in Civil Engineering from North Dakota State University, and completed graduate course study in Hydrology from Arizona State University. He is a Professional Civil Engineer in California and Arizona, and a Land Surveyor in California. Mr. Dahl has expertise in the design and construction of water distribution systems; hydrology and drainage projects; canals, channels, pipelines, and pumping stations; reservoir design; and bridges and roadways. Mr. Dahl is experienced in all phases of project and program implementation, including planning, analysis, design, plans and

specifications, costing, bidding, and construction management. He is the Project Manager for the American River Pump Station Project, and for Arcade Water District's Capital Improvement Program.

**Dennis E. Dorratcague** is a Principal Engineer and the water resources director in Montgomery Watson Harza's Northwest Region. He earned a B.S. from University of Notre Dame and his M.S. in Civil Engineering at Colorado State University. He is a Professional Civil Engineer in Washington, Oregon, Alaska, and California. He has been working in the field of hydrology and hydraulics since 1972, primarily concentrating on hydraulic structures and fisheries engineering. He has served as Technical Manager for the Banta-Carbona Irrigation District Fish Screen Feasibility Study and for the preliminary and final design for a fish screen, ladder, and tailrace barrier in Western Oregon. Mr. Dorratcague was also Project Manager for the development of the Feature Design Memorandum for the Surface Bypass Spillway Project; the hydraulic modeling, preliminary and final designs, and construction services of a fish screen on the White River in Western Washington; the preliminary and final design of a fish screen facility for Pacific Power and Light Company; and the Salmon Falls Fish Passage Project.

**Janet L. Atkinson** is a Supervising Engineer with 21 years of experience in the planning and design of water resource and general civil engineering projects with special emphasis on the design of pipelines and pumping plants. She received a B.S. in Civil Engineering from University of Oklahoma and is a Professional Civil Engineer in California and Oklahoma. She has served as project manager and project engineer for several planning and design projects for pump stations. She was responsible for leading the preliminary design effort for a 25 MGD pump station for the Contra Costa Water District. Ms. Atkinson also participated in the design of an irrigation distribution system for the Semitropic Water Storage District in Kern County, the preliminary design of the Central Utah Project Irrigation and Drainage System, and a conceptual engineering report for the San Francisco Water Department Alameda Creek Fishery Water Recapture Facility.

**Michelle Treinen** is an Engineer with experience in civil, environmental, and water resource engineering. She received a B.S. in Civil Engineering from Loyola Marymount University and a M.S. in Environmental Engineering from University of California Berkeley. She is a Professional Civil Engineer in California. Her experience covers a variety of fields within civil engineering such as civil site design, water supply projects, and wastewater treatment plant improvements. She has performed various tasks including reservoir sizing, yard piping design, site grading, access road design, drainage assessment, and construction scheduling. She also prepared a Mitigated Negative Declaration and has successfully mitigated for an endangered plant at a reservoir site. Ms. Treinen served as Project Engineer on the Spring Lane Tank No. 2 project located in Tiburon, California and is currently the lead Civil Engineer on the Eastridge Reservoir in Fairfield, California.

**Amy L. Wade** is an Associate Engineer with experience in civil, environmental, and water resource engineering. She received a B.S. in Civil and Environmental Engineering from Brigham Young University. Her background includes the planning, analysis, and design of flood management and water intake facilities. Ms. Wade has served as Project Engineer on several major water resources projects including the Pleasant Grove-Verona Fish Screen Feasibility Study, and participated in the preliminary design phase for the Sacramento River Watershed Project.

## **D. COST**

### **1. Budget**

The total amount requested by CALFED for the proposed three-year project is \$383,820. All of the tasks are required to complete the project.

### **2. Cost-Sharing**

The South Yuba and Brophy Water Districts will provide the labor, equipment, and materials necessary to complete the interim modifications once a design has been decided upon.

## **E. LOCAL INVOLVEMENT**

We have met with local representatives of the CDFG, NMFS and USFWS to discuss the issues surrounding the diversion facilities and the general concepts presented in this proposal. These same representatives, and others, will be workgroup participants who will help guide the project as it progresses.

## **F. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS**

The proposed project has been developed in compliance with all of CalFed's standard terms and conditions presented in Attachment D of the August 2001 PSP. The applicant has reviewed and will comply with CalFed's terms and conditions. The applicant also understands that the contract terms will apply to any sub-contracts that may be entered into to complete the proposed work. There are no conflicts of interest in performing this work.

## **G. LITERATURE CITED**

CALFED. 2001. Ecosystem Restoration Program: Draft Stage 1 Implementation Plan. CALFED Bay-Delta Program. 173 pp.

National Marine Fisheries Service. 1997. Fish screening criteria for anadromous salmonids. NMFS, Southwest Region. 10 pp.

State Water Resources Control Board. 2001. Decision 1644: regarding protection of fishery resources and other issues relating to diversion and use of water from the Lower Yuba River. SWRCB. 42 pp.