Summary Information

Tri−Dam Project

Assessment of project specific and cumulative effects of restoration on Stanislaus River juvenile chinook production

Amount sought: $478,509

Duration: 36 months

Lead investigator: Mr. Doug Demko, S.P. Cramer &Associates

Short Description

This project will use outmigration data collected with rotary screw traps in the lower Stanislaus River to continue monitoring the cumulative effects of in−channel restoration and other actions taken to restore and protect fall−run Chinook salmon (Oncorhynchus tshawytscha). Another goal of this project is to identify and quantify improvements in Stanislaus River juvenile production per spawner as a result of the Lovers' Leap Restoration Project. The Lovers' Leap Restoration Project, a gravel augmentation effort designed to increase the abundance of Chinook salmon and Central Valley steelhead, was funded by the United States Fish and Wildlife Service (USFWS), through the Central Valley Project Improvement Act's (CVPIA) Anadromous Fish Restoration Program (AFRP), and will be completed during 2005.

Executive Summary

Long−term monitoring is critical to evaluating the project specific and cumulative benefits associated with channel restoration and various measures implemented to protect at−risk species throughout the Bay−Delta watershed. Monitoring programs serve as a measure of progress towards meeting established recovery goals and assist in the identification, design, and prioritization of future actions. This project will use outmigration data collected with rotary screw traps in the lower Stanislaus River to continue monitoring the cumulative effects of in−channel restoration and other actions taken to restore and protect fall−run Chinook salmon (Oncorhynchus tshawytscha).

Another goal of this project is to identify and quantify improvements in Stanislaus River juvenile production per spawner as a result of the Lovers' Leap Restoration Project. The Lovers' Leap Restoration Project, a gravel augmentation effort designed to increase the

abundance of Chinook salmon and Central Valley steelhead, was funded by the United States Fish and Wildlife Service (USFWS), through the Central Valley Project Improvement Act's (CVPIA) Anadromous Fish Restoration Program (AFRP), and will be completed during 2005. In previous years, gravel restoration projects have been conducted based on the assumption that increasing the quantity and quality of spawning habitat for fall−run Chinook salmon will result in an increase in juvenile production per spawner followed by a corresponding increase in adult production, as evidenced by an increase in adult escapement. However, adequate monitoring to confirm and quantify these expected benefits has generally been absent from most projects. Six years of baseline juvenile Chinook salmon production estimates collected at Oakdale and Caswell from 2000 through 2005, and three years of post−restoration data proposed to be collected from 2006 through 2008 will be compared to escapement estimates to obtain a ratio of juvenile production per spawner. Comparisons of pre− and post project production estimates will allow us to determine whether juvenile production per spawner has increased, and to what extent, following the implementation of the Lovers' Leap Restoration Project.

Assessment of Project Specific and Cumulative Effects of Restoration on Stanislaus River Juvenile Chinook Production

A. Project Description: Project Goals and Scope of Work

1. Problem, Goals, and Objectives

Several gravel augmentation projects have been completed in the Stanislaus River since 1994 and another is scheduled for completion in 2005, all with the ultimate goal to increase the abundance of Chinook salmon and Central Valley steelhead by improving the quality and quantity of spawning and rearing habitat. The need for recent gravel augmentation efforts was identified by the observed relationships of annual escapement to corresponding juvenile production the following winter/spring. These relationships indicated that gravel supply and spawning habitat are limiting salmon production when escapement exceeds approximately 1,000 to 3,000 spawners (SRFG 2004). This is well below the CVPIA adult production (i.e., escapement + harvest) goal of approximately 20,000 fall-run Chinook which requires approximately 10,000 or more spawners escaping to the Stanislaus River, assuming that harvest is 50% or less of total adult production. Continued monitoring is needed to determine if the gravel augmentation projects are providing any measurable contribution towards increasing fall-run Chinook juvenile production per spawner and ultimately adult production, as evidenced by increased escapement.

The Lovers' Leap Restoration Project was initially part of a larger proposed effort entitled "Spawning Habitat and Floodplain Restoration in the Stanislaus River" that was submitted to the ERP in 2001. Funded by the United States Fish and Wildlife Service (USFWS), through the Central Valley Project Improvement Act's (CVPIA) Anadromous Fish Restoration Program (AFRP), the Lovers' Leap Restoration Project is in progress and gravel augmentation will occur in the summer of 2005. This project seeks to increase the quantity and quality of salmon spawning and rearing habitat in the lower Stanislaus River downstream from Goodwin Dam by restoring riverbed topography that was damaged by past instream gravel mining, increasing gravel supplies, and increasing the amount of functional floodplain habitat. The ultimate goal of the project is to increase the abundance of Chinook salmon and Central Valley steelhead.

The Knights Ferry Gravel Replenishment Project (#ERP 97-N21) was funded by CALFED in 1998 and resulted in the addition of 13,000 tons of gravel during August 1999. The objective of the Knights Ferry Gravel Replenishment Project (KFGRP) was to investigate 10 hypotheses regarding the environmental benefits and methods of adding clean gravel to the streambed of the Stanislaus River to improve spawning and incubation habitat for fall-run Chinook salmon (*Oncorhynchus tshawytscha*; CMC 2001).

Goodwin Canyon Spawning Gravel Introduction has occurred in many years between 1997 and 2004 under CVPIA funding.

In addition to gravel augmentation, other actions have been taken to protect and restore San Joaquin Basin Chinook salmon the most notable of which include the measures adopted within the San Joaquin River Agreement. If these measures are successfully protecting Chinook salmon as intended, juvenile production should increase over time. Continued monitoring is needed to track juvenile production over

time as a measure of cumulative restoration success, yet there is presently no dedicated funding to ensure future monitoring effort at Caswell.

2. Justification

The conceptual model used for the Lovers' Leap Restoration Project is one that was developed and presented in the proposed "Spawning Habitat and Floodplain Restoration in the Stanislaus River" project (Table 1). Previous monitoring efforts indicate that there is a need to identify and quantify the improvements, if any, to juvenile production that result from the Lovers' Leap Restoration Project. A similar gravel restoration project, the Knights Ferry Gravel Replenishment Project (KFGRP; #ERP 97-N21), was funded by CALFED in 1998 and post-restoration studies of the KFGRP demonstrated that intragravel dissolved oxygen levels (D.O.) and permeabilities in artificial and natural Chinook salmon redds were significantly greater in restoration sites than in control sites. However, it was not possible to determine whether the survival of Chinook salmon eggs to emergence was greater at the KFGRP restoration sites than at the control sites based solely on measurements of D.O. and permeability because the environmental factors that affect egg survival to emergence are poorly understood (CMC 2001). Juvenile production monitoring suggested that the rate of juveniles produced per spawner was improved following completion of the KFGRP, suggesting increased survival to emergence (SRFG 2004). However, the certainty of this finding is confounded by the fact that all baseline outmigration years were wet and all post-project outmigration years were dry. Continued monitoring is needed to verify the finding that juvenile production increased after gravel replenishment efforts in the Stanislaus River and to track the cumulative and long-term effects of the gravel additions at Knights Ferry, Lovers' Leap, and Goodwin Canyon.

Juvenile abundance data collected at Oakdale is a good method for determining the number of juveniles produced from the spawning reach independent of many survival issues encountered downstream. While, data collected from the two Caswell rotary screw traps is a good sampling method for determining the Stanislaus River's outmigration contribution to the San Joaquin Delta system. Through sampling at both locations, SPC has found that the numbers of juveniles produced, as indexed near the downstream end of the spawning reach at Oakdale, may differ substantially from the number of juveniles actually leaving the river in some years. Although increased juvenile production may be associated with improvements in the quality and quantity of spawning habitat, this may not result in the expected benefit of increased adult production due to substantial losses of juveniles as they migrate downstream through the lower river. For example, similar numbers of Chinook may be produced in the spawning reach in different years, but survival to Caswell may range from 7% to 95% depending on environmental conditions. It is important to understand the conditions under which improved juvenile production due to gravel augmentation may not result in improved adult production and ultimately adult escapement.

The proposed juvenile production monitoring is specifically designed to monitor one objective of the Lover's Leap Restoration Project (i.e., objective to increase the production of Chinook salmon juveniles that outmigrate and adults that return to the Stanislaus River to spawn). SPC will use juvenile outmigration estimates as performance measures to test the hypothesis that juvenile and adult abundance will be significantly greater following restoration compared to baseline conditions. The metric identified in the original scope of work to assess juvenile production was the estimated number of juveniles migrating past screw traps at Oakdale and Caswell Park in the Stanislaus River by SPC. However, this was not translated into the final scope of work for the Lovers' Leap Restoration Project and there is currently no funding commitment to ensure that juvenile production is estimated at Caswell following

the Lovers' Leap Restoration Project. Tri-Dam has made a financial commitment for monitoring at Oakdale to continue through at least 2008.

Table 1. Conceptual model for Spawning Habitat and Floodplain Restoration in the Stanislaus River which includes the Lovers' Leap Restoration Project.

Conceptual model of natural conditions and why it was important to ecosystem constituents:
• River adjusts its dimensions to transport coarse sediment at rate nearly equal to that supplied by the upstream watershed. • Lots of gravel in the unconfined alluvial reaches (say downstream of Knights Ferry), less so in the upstream canyon, but gravel is still stored there. • Floodplains allowed shear stress during high flows to be moderated, so that coarse sediment is transported, but not in a catastrophic manner. • Lots of coarse sediment storage (of diverse particle size created by meandering/migrating channel) provided large quantity of high quality spawning and rearing habitat for variety of salmonids. • Channel avulsed and migrated during larger flows, creating floodplains • Functional floodplains and snowmelt hydrograph was conducive to natural riparian regeneration on floodplains surfaces • Functional floodplains and snowmelt hydrograph was conducive to high quality fry and juvenile salmonid rearing habitat on floodplains, increasing water temperature, food supply, and juvenile salmonid growth rates. • Functional floodplains and snowmelt hydrograph caused fry and juvenile salmonid to rear on floodplains, causing some stranding, but the higher growth rates more than compensated for stranding losses by increasing overall juvenile salmonid survival (Sommer, 2000). • Frequent mobilization (and subsequent replacement) of gravel deposits lowered fine sediment storage in spawning deposits, maintaining high salmonid egg-to-emergence success.
How natural conditions have changed and impacts to key ecosystem constituents:
• Dams reduced the magnitude, duration, and frequency of high flows. The virtual loss of flows capable of frequently scouring riparian vegetation allowed it to encroach along the low flow channel, fossilizing gravel bars and encouraging riparian berms to form that confine the river (Pelzman, 1973; McBain and Trush, 1997). • Dams blocked coarse sediment supply to downstream reaches. Even though the high flow regime was reduced, there were periods when flood control releases transported coarse sediments. The combination of riparian fossilization of gravel bars, confinement from riparian berms and dikes, instream gravel mining, and loss of upstream coarse sediment supply reduced the volume of coarse sediment storage in the channel and armored the bed surface (Dietrich, et al., 1989). Cumulatively, this process greatly reduced the quantity of coarse sediment storage in the river, thus spawning habitat quantity was greatly reduced to the point where only approximately 2,000 spawners can be supported by available habitat. • Riparian encroachment, dikes constructed to isolate "off-channel" mining pits from the river, gold dredging, and "off-channel" gravel mining have virtually eliminated functional floodplains along the lower Stanislaus River. These physical impacts, combined with the regulated flow regime, has also virtually eliminated natural regeneration of cottonwoods and several willow species. • Loss of floodplains and access to them by juvenile salmonids has reduced growth potential, thereby reducing production potential. • Reduction of high flows and gravel bar mobilization frequency, combined with increased land disturbance in sandy loam soils downstream of Goodwin Dam, has increased fine sediment storage in spawning gravel deposits, decreasing salmonid egg-to-emergence success.
Conceptual model of the restoration will provide anticipated benefits to key ecosystem constituents:
• Greatly increase gravel storage and supply by introducing 27,080 yd^3 at five reaches a short distance downstream of Goodwin Dam. This will potentially increase the amount of spawning habitat by about 50 percent; in addition, adding this clean gravel will greatly improve spawning gravel quality, thereby increasing salmonid egg-to-emergence success. • Recreating floodplains by removing confining dredger tailings as part of the gravel introduction efforts. Some pilot efforts to breach riparian berms to improve floodplain inundation will also increase floodplain habitat, riparian regeneration, and potential salmonid production. • Repairing gullies that deliver large volumes of sandy loam to the river will increase the longevity of high quality spawning gravels and increase long-term salmonid production.

3. Previously Funded Monitoring

Juvenile production estimates exist from outmigration monitoring conducted at Oakdale and Caswell since 1996, exclusive of 1997. Monitoring at Caswell has been funded by CVPIA. CVPIA funding for the Caswell rotary screw trap has become increasingly unreliable in recent years, resulting in an annual scramble to secure funding prior to the sampling season. Often this has resulted in a reduction in sampling effort and in the deletion of tasks such as statistical review and analysis. Monitoring at Oakdale has been funded by Tri-Dam, which is comprised of the South San Joaquin Irrigation and Oakdale Irrigation Districts. Tri-Dam has made a financial commitment for this monitoring to continue through at least 2008.

4. Approach and Scope of Work

The study goals for this monitoring project are to (1) identify and quantify improvements in juvenile production per spawner as a result of the Lovers' Leap Restoration Project and (2) monitor the cumulative effect of gravel augmentation projects, and of other measures intended to protect and restore fall-run Chinook salmon, on juvenile production in the Stanislaus River. The following objectives will be performed:

Objective 1. Manage project to ensure that all objectives and reporting requirements are met on time and within budget.

Task 1.1 Project management.

Tri-dam will be responsible for overall project management and administrative activities. Project management will consist of managing the contract, submitting progress reports, budget tracking and invoicing. The work products will consist of semi-annual fiscal and programmatic reports.

Activity 1.1.1 Execute contract with funding agency and sub-contractors.

Tri-dam will sign and execute the contract with the funding agency and submit additional information, if required. Tri-dam will also execute a contract with the sub-contractor, S.P. Cramer & Associates (SPC), and submit a copy to the funding agency within ninety (90) days of execution.

Activity 1.1.2 Provide technical oversight to ensure that all project objectives are met, tasks are carried out in the manner described, and deliverables are completed on schedule.

SPC will oversee the coordination of all field activities to ensure that the project objectives are met and that all deliverables are completed on schedule. This includes adaptively managing the project to respond to unforeseen challenges in the field and to modify sampling elements if needed.

Activity 1.1.3 Manage project funds.

Tri-dam will prepare and submit invoices inclusive of subcontractor services to the funding agency on a monthly basis. Three copies of the invoice will be provided to the funding agency, including one signed invoice and two duplicate copies. Activity reports will accompany each monthly invoice and will describe the work conducted during the month.

Activity 1.1.4 Prepare and submit semi-annual fiscal and programmatic reports to

funding agency.

Fiscal and programmatic reports will be submitted to the funding agency on a semi-annual basis. The semi-annual reports will describe the fiscal and programmatic status during each six month period. These reports will include (1) the total amount of money awarded to the project, (2) the amount invoiced to the granting agency and cost-sharing partners, (3) description of activities performed during the six month period and the percentage of each task completed, (4) deliverables produced during the six month period, (5) problems encountered that may delay the progress of the project, and (6) description of amendments or modifications to the grant agreement.

Task 1.2 Prepare and distribute bi-weekly sampling summaries.

SPC will distribute bi-weekly summaries of all field activities during the sampling season to the agencies, managers, and other interested parties. Bi-weekly summaries will include a written description of activities, as well as relevant tables and graphs. As in the past, SPC will also post these summaries on our Internet site so that the project is accessible to a wide audience [www.stanislausriver.com].

Task 1.3 Submit electronic and hardcopy of data collected annually

Data will be collected by field personnel, entered into a Microsoft Access database, and error checked before being submitting to the funding agency at the end of each of the three project years. SPC will provide to the funding agency an electronic and hard copy of the data collected along with a written description of field procedures, summary tables and graphs, and an account of database management procedures.

Task 1.4 Prepare and distribute annual data reports.

SPC have found that many are interested in the raw outmigration data generated by the monitoring efforts at Oakdale and Caswell for comparison to similar or related projects. Annual study reports typically do not provide all of the detailed monitoring data collected during the study. To improve the efficiency of sharing frequently requested information with interested parties SPC began distributing annual data reports in 2000. These reports include data tables and graphs only with no interpretation of the results. SPC will continue to provide these reports annually.

Task 1.5 Compile research findings into comprehensive annual reports of study findings.

Each year, SPC will prepare a comprehensive written report describing events and study findings to date. All reports will be distributed to managers involved with work in the Stanislaus River and San Joaquin Basin for review and comment. The final report will include comparisons to past years data from the Stanislaus River at Oakdale and Caswell, as well as outmigration data collected elsewhere along the west coast. SPC will compare data collected before restoration to data collected after the Lovers' Leap Restoration Project is complete to identify and quantify the influence of the restoration effort, if any, on the production of juvenile Chinook salmon.

Task 1.6 Participate at workshops, seminars, and conferences.

SPC will prepare and deliver at least one PowerPoint presentation of study findings and project status to a scientific or resource group (e.g., CALFED, American Fisheries Society, etc.). SPC has regularly attended the CALFED Science Conference and AFS annual meetings and delivered several

presentations at each forum. Presentations will likely include comparisons to past years data from the Stanislaus River, as well as data collected elsewhere along the west coast.

Objective 2: Estimate the production of juvenile Chinook salmon in the Stanislaus River during 2006, 2007, and 2008.

In order to estimate the production of juvenile Chinook, SPC will estimate the daily number of juvenile Chinook migrating past two established sampling locations during the outmigration season. This objective is composed of the following tasks:

Task 2.1 Sample outmigrating salmonids during January through June 2006-08.

SPC will capture juvenile Chinook salmon in rotary screw traps as they migrate downstream through the Stanislaus River from January through June. As in previous years, one trap will operate at Oakdale (RM 40.1) and two traps will operate at Caswell State Park (RM 8.6). The traps will sample 24 hours per day, 3 to 7 days per week. The traps will be monitored a minimum of one time per day and the live box cleared to insure that (1) fish are not experiencing mortality or stress as a result of debris accumulating in the livebox and (2) that the traps are free of debris and fishing properly.

All data, including fish length, weight, and smolt appearance, will be collected in compliance with standards established in the CVPIA Comprehensive Assessment and Monitoring Program protocol. SPC contributed to the development of the protocol, and are therefore well aware of the requirements. All data will be collected on data sheets in the format used by the USFWS throughout the Central Valley.

Task 2.2 Estimate trapping efficiency for Chinook salmon and the factors affecting it.

Because trap efficiency is influenced by factors that continually change, we will conduct trap efficiency tests as often as possible, ideally weekly or twice weekly starting in January, or as soon as fish are abundant and large enough to mark. Factors affecting the frequency of efficiency tests include the availability of hatchery and natural fish and the permission of CDFG. The frequency of these tests and the marks used will be coordinated with CDFG. Regular efficiency tests should ensure that trap efficiency is tested several times at base and peak flows, as well as in-between flows. Repeated efficiency tests will enable quantification of the relationship between river flow, turbidity, fish size, and trap efficiency.

Each morning, SPC will measure the water velocity at the mouth of each trap with a flow meter and record the average time per revolution of each cone. A mechanical counter will be placed on each cone to count the revolutions the traps make each 24-hour period. Each morning, the number of revolutions will be recorded and the counters will be cleared. If either trap becomes jammed and stops during sampling, the time that it fished will be estimated by the number of revolutions it made since it was last checked. Estimated debris level inside each livebox will also be recorded.

Other physical factors that will be recorded include turbidity and temperature. Stream channel configuration will be evaluated by measuring cross-sections immediately upstream from the traps whenever flows change substantially or a minimum of once per month, and a digital photograph at an established photo point(s) will be taken.

Task 2.3 Estimate the number of Chinook migrating out of the river each day such that a reliable index of juvenile Chinook production in the Stanislaus River during 2006-08 can be estimated.

SPC will estimate the number of Chinook migrating out of the river each day from the daily catch of juvenile Chinook and the predicted trap efficiency. To estimate the number of outmigrants, we will use an appropriate form of the expression:

Daily number of outmigrants = Daily catch / Daily trap efficiency

Daily trap efficiency will be predicted independently for each trapping location by a statistical model developed from observed trap efficiency test results. In order to predict the efficiency for each passage day, the efficiency estimates must be related as a response or "dependent" variable to predictor or "independent" variables that are measured every day that the screw trap was operating. Substituting a given day's values of the predictor variables into the predictive relation then provides an estimate of that day's efficiency.

The predictor variables explored will be river flow, fish size, and turbidity. Efficiency (e), the proportion of fish recovered per release, will be related to the predictor variables using the following logistic function:

$$e_i = \frac{1}{1+\exp\left[-b(0)-b(f)*f-b(s)*s-b(t')*t'\right]}$$

or, in the form of the "logit" linear transform,

$$\log it(e_i) = \ln\left[\frac{e_i}{1-e_i}\right] = b(0)+b(f)*f+b(s)*s+b(t')*t'$$

In the above equations, b(0) is a coefficient associated with the intercept, and the other b(i)'s are partial logistic regression coefficients relating the logit transform of efficiency predictor to the associated x(i)'s which are the selected variables from the flow, size, and turbidity. A major reason for choosing the logistic model is that the predicted efficiency can never be less than 0 and can never exceed 1 (100%).

More detailed description of the method used to estimate juvenile production can be found in Demko and others 2000.

Objective 3: Determine juvenile production per spawner and identify confounding factors in the Stanislaus River that may influence the contribution of juvenile Chinook production to adult escapement.

Task 3.1 Estimate juvenile production per spawner.

Juvenile production per spawner will be calculated by the same method used previously to interpret past monitoring results (SRFG 2004). Escapement estimates will be adjusted for differences in fecundity associated with age. Specifically, escapement will be standardized to the equivalent number of Age 3

spawners. Juvenile production estimates will be divided by the number of Age 3 equivalent spawners to obtain annual juvenile production per spawner ratios.

Task 3.2 Estimate juvenile survival between Oakdale and Caswell.

SPC has found that the numbers of juveniles produced, as indexed by the estimated juvenile production at Oakdale located near the downstream end of the spawning reach, may differ substantially from the number of juveniles actually leaving the river in some years. Therefore, increased juvenile production associated with improvements in the quality and quantity of spawning habitat may not result in the expected benefit of increased adult escapement due to survival through the lower river. For example, similar numbers of Chinook may be produced in the spawning reach in different years, but survival to Caswell may range from 7% to 95% depending on environmental conditions. It is important to understand the conditions under which improved juvenile production may not result in improved adult production and ultimately adult escapement.

Survival through the lower Stanislaus River will be estimated by dividing the total estimated production at Caswell by the total estimated production at Oakdale.

Task 3.3 Monitor environmental variables that may influence juvenile survival.

SPC will monitor environmental and biological variables over the course of the study and use correlation analysis to determine their influence on juvenile Chinook migration and survival between Oakdale and Caswell. As described previously, biological sampling will be conducted in accordance with CAMP protocols.

SPC will maintain hourly recording thermographs in the lower Stanislaus River, approximately every 10 miles between Goodwin Dam and Caswell State Park. Data will be downloaded every two months. SPC will also measure the water temperature daily at Caswell and Oakdale with a hand-held thermometer. SPC will assemble pertinent data on river flow and water quality collected by the USGS in the Stanislaus River at stations below Goodwin Dam. A staff gauge will also be installed near the Caswell trap site to monitor daily water surface levels. SPC will measure instantaneous turbidity and record weather conditions each day at Caswell and Oakdale.

5. Feasibility

Multiple years of juvenile monitoring in the Stanislaus River indicate that the proposed approach is appropriate and feasible for identifying and quantifying improvements, if any, in juvenile production relative to the Lovers' Leap Restoration Project. SPC has operated the Caswell rotary screw traps for 10 years (1995-2004) and has considerable experience operating other screw traps as well. Our staff is very familiar with the technical aspects of operating screw traps and has the expertise necessary to complete the objectives. All SPC staff hold current scientific collecting permits issued by the CDFG and as stipulated in the requirements of the permit, a letter of authorization will be obtained from the CDFG Region 4 Senior Fishery Biologist before sampling activities begin. We have fulfilled this requirement and the additional requirements imposed by Region 4 for numerous projects conducted in recent years and thus have become familiar with the procedures.

Take of Central Valley steelhead during Stanislaus River rotary screw trap monitoring is currently authorized under the Central Valley OCAP Biological Opinion. It is the understanding of SPC that this

authorization may not be granted in the future and a Section 10 permit from NOAA may be needed to continue juvenile monitoring. We will apply for this permit during 2005.

6. Expected Outcomes and Products

The proposed project is expected to increase understanding of the population level benefits of gravel augmentation projects and various measures implemented to protect at-risk species for restoring salmonid populations in the Central Valley, specifically the Stanislaus River. This information will guide the prioritization of future restoration efforts within the Stanislaus River and other Central Valley streams.

Products of the proposed effort will include bi-weekly summaries (Task 1.2), an Access database and hardcopies of sampling results (Task 1.3), semi-annual fiscal and programmatic reports (Activity 1.1.4), annual data reports (Task 1.4), comprehensive annual reports (Task 1.5), and presentations at workshops, seminars, and conferences (Task 1.6).

7. Data Handling, Storage, and Dissemination

Data will be entered into the computer in Microsoft Access format. SPC has been working in cooperation with Department of Water Resources (DWR) to develop a database for the rotary screw trap at Caswell State Park. The database was developed as part of the Interagency Ecological Program, which is responsible for disseminating data in a real time manner for rotary screw traps fishing at the mouths of each tributary in the Sacramento-San Joaquin Basin, as required by CVPIA Comprehensive Assessment and Monitoring Program. The data will be exported to the DWR database center as will other rotary screw trap data collected from other tributaries. All outmigration data collected in the Stanislaus River will be summarized and made available on a web site (www.stanislausriver.com) for access on a real time basis.

8. Public Involvement and Outreach

SPC will continue to attend and participate in meetings of the Stanislaus River Fish Group and the IEP Juvenile Monitoring Project Work Team. Members of these groups include representatives from the California Department of Fish and Game, the US Fish and Wildlife Service, California Department of Water Resources, the US Bureau of Reclamation, National Marine Fisheries Service, US Army Corps of Engineers, and several consulting firms and non-profit organizations. SPC will also continue to participate at workshops, seminars and conferences such as the CALFED conference.

SPC will also continue to involve the public during continued monitoring. Informational handouts developed for the public several years ago to describe fisheries research activities and study findings on the Stanislaus River were recently updated. SPC will continue to update these fliers as needed and make them available to the public at the Stanislaus River Parks office in Knights Ferry, on park message boards, and when approached during the course of our work in the field.

SPC will also continue our involvement in field site tours for school and environmental groups and will participate as guest speakers for local events such as the Brush Rabbit Festival and Earth Day improvements at Caswell State Park. All of this work to engage the public has been conducted on a volunteer basis.

A website containing current information regarding daily operations and data collection will be maintained on a regular basis. Interested parties will receive e-mail updates summarizing the results of the data collected and how they compare to previous years of sampling.

9. Work Schedule

SPC will operate the Oakdale and Caswell traps 24 hours per day, 3 to 7 days per week from January through June. The traps will be monitored a minimum of one time per day and the live box cleared to insure that (1) fish are not experiencing mortality or stress as a result of debris accumulating in the livebox and (2) that the traps are free of debris and fishing properly. It is our experience that screw traps can require substantially more attention during high debris periods or during freshet events to remain operational. Some freshets last longer than two or three days, which can require a substantial amount of labor because SPC may be forced to monitor the traps at 4 to 8 hour intervals. Although sampling like this can quickly deplete a budget, it is obviously crucial to obtaining accurate outmigrant estimates. The annual budgets anticipate that SPC will be forced to sample the traps more frequently during extended freshets.

Bi-weekly summaries will be written and distributed throughout the field sampling period extending from January through June (see Task 1.2). At the end of each sampling period (i.e., July) electronic and hardcopies of data will be provided to the funding agency and a data report will be distributed (see Task 1.4). Comprehensive annual reports will be completed in December 2006, 2007, and 2008 (see Task 1.5).

Monthly activity summaries will also accompany each invoice (see Activity 1.1.3) and semi-annual status reports will also be provided to the funding agency every six months for the course of the three-year project (Activity 1.1.4).

B. Applicability to CALFED Bay-Delta Program ERP Goals, the ERP Draft Stage I Implementation Plan, and CVPIA Priorities

1. ERP and CVPIA Priorities

ERP Goals

At the heart of the ERP are six Strategic Goals. Each of the goals address a different aspect of the restoration of the Bay-Delta Watershed and this project will assist in meeting five of the six goals.

Strategic Goal 1 refers specifically to the recovery of at-risk species that rely on the Delta as a critical component of their life-histories. The proposed project seeks to provide information directly applicable to this goal. Quantifying the improvements, if any, in juvenile production resulting from the Lovers' Leap Restoration Project will assist in prioritizing future restoration efforts.

Strategic Goal 2 recognizes that an ecosystem restoration plan must include restoration and maintenance of ecosystem processes, such as seasonal fluctuations in streamflow to support natural aquatic communities. Scientific uncertainties that may influence the ability to achieve this goal include questions about the ability to simulate natural flow regimes and threshold flows for critical ecosystem processes, and a better understanding about how channel dynamics affect habitat restoration and at-risk species. The information obtained by this project will improve our understanding of how flows affect

migration patterns and survival of juvenile Chinook salmon.

Strategic Goal 3 provides for the maintenance and/or enhancement of populations of certain harvestable species, including Chinook salmon. The applicability of the goal to the proposed project is similar to that described for Strategic Goal 1 in that the information gathered will be used to prioritize future restoration actions.

Strategic Goal 4 notes that although the importance of restoring additional habitats is not debated, there are difficult choices regarding the relative importance of restoring different habitat types, and there is a pressing need to develop better tools to make these decisions. This project will provide information that will be useful in evaluating the relative importance of gravel augmentation efforts.

Strategic Goal 5 refers to the need to prevent the establishment and reduce the negative impacts of non-native species. Although the proposed project does not seek to prevent the establishment of non-native species, it does provide a means of detecting their presence and monitoring their abundance. For example the red shiner (*Cyprinella lutrennsis*), an introduced minnow, was first detected in the Stanislaus River by the trapping effort at Caswell State Park in the late 1990's. Within a few years they were also detected at Oakdale and are now captured regularly at both sites indicating a tremendous increase in their abundance in the Stanislaus River. Similarly, rotary screw trap monitoring on the nearby Calaveras River resulted in the detection of New Zealand mudsnails during 2004.

CVPIA Goals

The Central Valley Project Improvement Act (CVPIA) states as one of its goals that it is meant to "protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley...of California". Part of this goal is achieved through authorization of the Anadromous Fish Restoration Program (AFRP). The goal of the AFRP is to develop and implement a program that attempts to ensure that the natural production of anadromous fish in the Central Valley will be double that of average levels reached between 1967 and 1991 and that the new production levels will be sustainable over the long term. One objective set forth by the AFRP is the collection of fish population, health, and habitat data. Without this reference data, specific target levels of production and general population condition would not be able to be developed in a manner that would accurately reflect the levels historically attained in a specific watershed.

Accurate and complete reference data takes much of the guesswork out of management decisions based on evaluations of restoration actions. The success of restoration activities can only be judged through the monitoring of population trends that are based on the most complete data available. This is especially crucial in the management of at-risk species because these populations are more sensitive to change than are more stable groups. Monitoring of at-risk salmonids emigrating past Oakdale and Caswell State Park will provide solid information to evaluate the benefits associated with the Lovers' Leap Restoration Project and thereby guide future restoration actions.

2. Relationship to Other ERP Actions, Monitoring Programs, or System-wide Ecosystem Benefits

In order for the CALFED Program to be successful in its attempts to set the Bay-Delta Region on a path to ecological recovery, it is necessary that a research and monitoring program be complimentary to some of the other restoration efforts that have been funded or may be funded in the future. This project has in the past and will provide in the future information on the number and timing of juvenile Chinook

migrating from the Stanislaus River and into the San Joaquin River and Delta. Such information is of importance to programs such as the Vernalis Adaptive Management Plan and the Interagency Ecological Program, and in combination with the information collected by these programs, the Stanislaus River juvenile production information will be used in refining management strategies and prioritizing restoration actions.

3. Additional Information for Proposals Containing Land Acquisition

Not applicable.

C. Qualifications

Tri-Dam Project

The Tri-Dam Project (Tri-Dam) is a partnership between two public agencies: the Oakdale Irrigation District and the South San Joaquin Irrigation District. Both irrigation districts were formed in 1909 to provide reliable irrigation. Since the early 1990's, Tri-Dam has taken an active role in fisheries monitoring, protection, and enhancement on the lower Stanislaus River through the funding of several fisheries monitoring programs. Tri-Dam has retained S.P. Cramer & Associates (SPC) since 1993 to provide fisheries consulting services related to the above activities. Tri-Dam has funded annual rotary screw trap monitoring since 1993, radio tracking in 1998-99, studies involving outmigrant responses to pulse-flows, and annual advisory funding for SPC to attend meetings in order to keep them up-to-date on all fisheries issues. Tri-Dam will extend its existing contract with SPC to conduct the proposed project activities.

Steve Felte, **General Manager of Tri-Dam.** Steve will serve as contract manager and will be responsible for quality assurance and control throughout the project. As general manager of Tri-Dam, Steve oversees all of Tri-Dam's daily operational activities and has experience in administering large projects.

S.P. Cramer & Associates

S.P. Cramer & Associates, Inc. (SPC) was established in 1987 to provide innovative solutions for issues relating to salmon and trout on the Pacific Coast. SPC is reputed for investigative work in determining why fish populations have or may change in response to specific actions. SPC has been conducting salmonid research on the Stanislaus River for Tri-Dam, the Comprehensive Assessment and Monitoring Program, and the USFWS's Anadromous Fish Restoration Program since 1993; therefore, SPC is very familiar with basin issues, key watershed participants, and the actions necessary to conduct the proposed project. SPC has also conducted numerous fisheries investigations and assessments in other tributaries within the Sacramento-San Joaquin basin. Previous and ongoing fisheries research includes, but is not limited to, annual juvenile salmonid outmigration monitoring, adult migrant trapping, radio-tracking, and electrofishing studies.

Doug Demko, Senior Consultant. Doug manages and coordinates project activities both within SPC and between cooperating agencies. He also supervises data analyses, interpretation, and report preparation activities. Doug received a Bachelor's degree in Biology in 1992, a Juris Doctor degree in 2002, and has worked in the San Joaquin Basin since 1993. 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 San Joaquin Basin is more extensive than many researchers, and includes project

management of studies such as juvenile salmonid outmigration, smolt survival, radio-tracking, predator surveys, resident trout population estimates, habitat surveys, and limiting factors analyses.

Andrea Fuller, Fish Biologist. Andrea joined SPC as a fisheries technician in 1995 and was promoted to Fish Biologist in 2000 while attending California State University, Stanislaus. She coordinates and oversees field personnel and data collection activities and assists in data analyses and report preparation. Since joining SPC, she has assisted Doug Demko in the coordination of field research activities on major tributaries to the San Joaquin River. As a field research coordinator, she conducts considerable networking and coordination with state, federal, and local government agency representatives; private consultants; landowners; and recreational groups.

Michele Simpson, Fish Biologist. Michele joined SPC in 2002 after working as a fisheries biologist for both the U.S. Bureau of Reclamation and NOAA Fisheries. She received her Master's degree in Biology in 1997. She specializes in Endangered Species Act issues regarding salmonid populations in California including effects analyses of projects potentially effecting listed salmonids including reservoir management, unscreened diversions, fish passage barriers/impediments, and habitat restoration. She also conducts data analyses and report preparation and review of SPC monitoring projects within the Central Valley. In addition, she collaborates extensively with state, federal, and local government agency representatives; landowners, and other interested groups regarding fisheries management issues.

D. Cost

1. Budget

The total cost of the program is $930,685, of which we are requesting $478,508 from the ERP.

2. Cost Sharing

The total cost of the Juvenile Production Monitoring Program is $930,685, of which we are requesting $478,508 from the ERP to operate the Caswell outmigration trapping station. Outmigration trapping at Oakdale will continue to be funded by Tri-Dam during the 3 year project at an estimated total cost of $422,177. In-kind services will also be provided by Tri-Dam at a total estimated cost of $30,000 for project management. In total, Tri-Dam's cost share is 49% of the project cost.

3. Long-term Funding Strategy

The Caswell outmigration trapping station has been funded for the past 10 years by the USFWS, and specifically by the AFRP. Program budgets for the USFWS have declined in recent years such that limited funding has been provided for monitoring at Caswell. Due to funding reductions, bare-bones monitoring and reporting for the Caswell station has been conducted during the last several years with the hope that additional funding would become available in the future for analysis of the long-term dataset. It has been a challenge to piece together enough funding for the monitoring alone. More funding has not become available and is not expected to materialize in the foreseeable future.

E. 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 3 of the September 2004 PSP. The applicant has reviewed and will comply with the State of California standard contracting terms and conditions. We also agree the prevailing law shall be the State of California and the venue for settling any disputes, if any, shall be Sacramento, California. 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.

F. Literature Cited

Carl Mesick Consultants (CMC). 2001. Continued Studies for the Knights Ferry Gravel Replenishment Project, Phase 2. Proposal submitted to the Ecosystem Restoration Program in response to the 2001 PSP.

Mesick, C. 2001. Studies of spawning habitat for fall-run Chinook salmon in the Stanislaus River between Goodwin Dam and Riverbank from 1994 to 1997. Pages 217-252 in R.L. Brown, editor. Contributions to the Biology of Central Valley Salmonids: Fish Bulletin 179, Vol. 2. State of California, The Resources Agency, Department of Fish and Game, Sacramento, CA.

Demko, D.B., C. Gemperle, A. Phillips, and S.P. Cramer. 2000. Outmigrant trapping of juvenile salmonids in the lower Stanislaus River Caswell State Park Site, 1999. Report prepared for the U.S. Fish and Wildlife Service's Anadromous Fish Restoration Program by S.P. Cramer & Associates under contract with CH2M Hill, Sacramento, California.

Stanislaus River Fish Group (SRFG). 2004. A Summary of Fisheries Research in the Lower Stanislaus River. Working draft. Available on the SRFG website at http://www.delta.dfg.ca.gov/srfg/

G. Nonprofit Verification

Not applicable.

Table 1. Estimated labor and expenses for S.P. Cramer & Associates.

Estimated Labor and Expenses for CALFED Proposal

Title: Assessment of Improvements in Stanislaus River Juvenile Chinook Production Resulting from the Lover's Leap Gravel Augmentation Projects.

Year 1	Total Tech hrs	$44.69/hr Tech	Total Hrs Bio I	$56.65/hr Bio I	Total Hrs Bio II	$89.11/hr Bio II	Total Hrs Bio III	$100.63/hr Bio III	Total Hrs Sr Conslt	$115.39/hr Sr Conslt
Objective 1: Manage project to ensure that all objectives and reporting requirements are met on time and within budget.										
Task 1.1 Project Management	0	$0.00	0	$0.00	40	$3,564.40	0	$0	$40	$4,616
Task 1.2 Prepare and distribute bi-weekly sampling summaries.	0	$0.00	40	$2,266.00	0	$0.00	12	$1,208	$6	$692
Task 1.3 Submit electronic and hard copy of data collected annually.	8	$357.52	1	$56.65	0	$0.00	0	$0	$0	$0
Task 1.4 Prepare and distribute annual data reports.	40	$1,787.60	20	$1,133.00	2	$178.22	0	$0	$0	$0
Task 1.5 Compile research findings into comprehensive annual reports of study findings	0	$0.00	20	$1,133.00	50	$4,455.50	40	$4,025	$48	$5,539
Task 1.6 Participate in workshops, seminars and conferences.	0	$0.00	10	$566.50	20	$1,782.20	0	$0	$40	$4,616
Objective 2: Estimate juvenile Chinook salmon production in the Stanislaus River.										
Task 2.1 Sample outmigrant salmonids	1100	$49,159.00	60	$3,399.00	60	$5,346.60	0	$0	$60	$6,923
Task 2.2 Estimate trapping efficiency	200	$8,938.00	40	$2,266.00	40	$3,564.40	10	$1,006	$10	$1,154
Task 2.3 Develop outmigration index	0	$0.00	10	$566.50	20	$1,782.20	20	$2,013	$24	$2,769
Objective 3: Identify factors in the Stanislaus River that influence the contribution of juvenile Chinook production to adult escapement.										
Task 3.1 Estimate juvenile production per spawner.			7	$396.55	7	$623.77	8	$805	$10	$1,154
Task 3.2 Estimate juvenile survival between Oakdale and Caswell.	0	$0.00	1	$56.65	1	$89.11	0	$0	$0	$0
Task 3.3 Monitor environmental variables	88	$3,932.72	8	$453.20	8	$712.88	0	$0	$0	$0

Estimated Labor and Expenses for CALFED Proposal

Title: Assessment of Improvements in Stanislaus River Juvenile Chinook Production Resulting from the Lover's Leap Gravel Augmentation Projects.

Year 1	Total Labor	Travel Cost	Supplies & Expendables	Equipment (>$1000)	Other Direct Costs	2006 Total Cost	2007 Total Cost	2008 Total Cost
Objective 1: Manage project to ensure that all objectives and reporting requirements are met on time and within budget.								
Task 1.1 Project Management	$8,180	$0	$200	$0	$0	$8,380	$8,799	$9,239
Task 1.2 Prepare and distribute bi-weekly sampling summaries.	$4,166	$0	$250	$0	$0	$4,416	$4,637	$4,869
Task 1.3 Submit electronic and hard copy of data collected annually.	$414	$0	$50	$0	$0	$464	$487	$512
Task 1.4 Prepare and distribute annual data reports.	$3,099	$0	$250	$0	$0	$3,349	$3,516	$3,692
Task 1.5 Compile research findings into comprehensive annual reports of study findings	$15,152	$0	$250	$0	$0	$15,402	$16,173	$16,981
Task 1.6 Participate in workshops, seminars and conferences.	$6,964	$500	$200	$0	$0	$7,664	$8,048	$8,450
Subtotal	**$37,976**	**$500**	**$1,200**	**$0**	**$0**	**$39,676**	**$41,659**	**$43,742**
Objective 2: Estimate juvenile Chinook salmon production in the Stanislaus River.								
Task 2.1 Sample outmigrant salmonids	$64,828	$6,500	$5,000	$0	$0	$76,328	$80,144	$84,152
Task 2.2 Estimate trapping efficiency	$16,929	$2,500	$200	$0	$0	$19,629	$20,610	$21,641
Task 2.3 Develop outmigration index	$7,131	$0	$200	$0	$0	$7,331	$7,697	$8,082
Subtotal	**$88,887**	**$9,000**	**$5,400**	**$0**	**$0**	**$103,287**	**$108,452**	**$113,874**
Objective 3: Identify factors in the Stanislaus River that influence the contribution of juvenile Chinook production to adult escapement.								
Task 3.1 Estimate juvenile production per spawner.	$2,979	$0	$200	$0	$0	$3,179	$3,338	$3,505
Task 3.2 Estimate juvenile survival between Oakdale and Caswell.	$146	$0	$0	$0	$0	$146	$153	$161
Task 3.3 Monitor environmental variables	$5,099	$200	$200	$0	$0	$5,499	$5,774	$6,062
Subtotal	**$5,245**	**$200**	**$400**	**$0**	**$0**	**$8,824**	**$9,265**	**$9,728**
Total	**$132,107**	**$9,700**	**$7,000**	**$0**	**$0**	**$151,787**	**$159,376**	**$167,345**

Tasks And Deliverables

Assessment of project specific and cumulative effects of restoration on Stanislaus River juvenile chinook production

Task ID	Task Name	Start Month	End Month	Deliverables
1.1	Project Management	1	36	Monthly invoices, activity reports, semi-annual fiscal and programmatic reports
1.2	Bi-weekly sampling summaries	1	36	Bi-weekly sampling summaries (to be distributed January through July of each year); web updates
1.3	Submit data to funding agency	1	36	electronic and hard copy of data collected annually; Access database of sampling results
1.4	Prepare data reports	1	36	Annual data reports
1.5	Compile research findings	1	36	Draft and final annual comprehensive reports
1.6	Participate in workshops, seminars, and conferences	1	36	Power point presentations, attendance and participation at workshops, seminars and conferences
2.1	Sample outmigrating salmonids	1	36	Access database, annual data reports
2.2	Estimate trap efficiency	1	36	Access database, annual data reports
2.3	Estimate number of migrating Chinook	1	36	Draft and final comprehensive annual report
3.1	Estimate juvenile production per spawner	1	36	Draft and final comprehensive annual report

3.2	Estimate juvenile survival	1	36	Draft and final comprehensive annual report
3.3	Monitor environemntal variables	1	36	Access database, annual data reports

Comments

If you have comments about budget justification that do not fit elsewhere, enter them here.

Budget Summary

Project Totals

Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of Way	Other Direct Costs	Direct Total	Indirect Costs	Total
$0	$0	$0	$0	$478,509	$0	$0	$0	$478,509	$0	$478,509

Do you have cost share partners already identified?
Yes.

If yes, list partners and amount contributed by each:

Tri−dam Project will contribute in−kind services by providing administrative services for the project management task (1.1) and by assisting with trap removal and installation each trap. They will also fund the monitoring efforts at the upstream trapping site (Oakdale)each year. The total estimated cost−share from Tri−dam is $452,177, which includes $422,177 for monitoring for 3 years and $30,000 for administrative and trap installation/removal assistance.

Do you have potential cost share partners?
No.

If yes, list partners and amount contributed by each:

Are you specifically seeking non−federal cost share funds through this solicitation?
No.

Assessment of project specific and cumulative effects of restoration on Stanislaus River juvenile chinook production

Assessment of project specific and cumulative effects of restoration on Stanislaus River juvenile chinook production

Year 1 (Months 1 To 12)

Task	Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of Way	Other Direct Costs	Direct Total	Indirect Costs	Total
1.1: project management (12 months)	0	0	0	0	8380	0	0	0	$8,380	0	$8,380
1.2: Bi−weekly sampling summaries (12 months)	0	0	0	0	4416	0	0	0	$4,416	0	$4,416
1.3: Submit data to funding agency (12 months)	0	0	0	0	464	0	0	0	$464	0	$464
1.4: Prepare data reports (12 months)	0	0	0	0	3349	0	0	0	$3,349	0	$3,349
1.5: Compile research findings (12 months)	0	0	0	0	15402	0	0	0	$15,402	0	$15,402
1.6: Participate in workshops, seminars, and conferences (12 months)	0	0	0	0	7664	0	0	0	$7,664	0	$7,664
2.1: Sample outmigrating salmonids (12 months)	0	0	0	0	76328	0	0	0	$76,328	0	$76,328
	0	0	0	0	19629	0	0	0	$19,629	0	$19,629

2.2: Estimate trap efficiency (12 months)											
2.3: Estimate number of migrating Chinook (12 months)	0	0	0	0	7331	0	0	0	$7,331	0	$7,331
3.1: Estimate juvenile production per spawner (12 months)	0	0	0	0	3179	0	0	0	$3,179	0	$3,179
3.2: Estimate juvenile survival (12 months)	0	0	0	0	146	0	0	0	$146	0	$146
3.3: Monitor environemntal variables (12 months)	0	0	0	0	5499	0	0	0	$5,499	0	$5,499
Totals	**$0**	**$0**	**$0**	**$0**	**$151,787**	**$0**	**$0**	**$0**	**$151,787**	**$0**	**$151,787**

Year 2 (Months 13 To 24)

Task	Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of Way	Other Direct Costs	Direct Total	Indirect Costs	Total
1.1: project management (12 months)	0	0	0	0	8799	0	0	0	$8,799	0	$8,799
1.2: Bi−weekly sampling summaries (12 months)	0	0	0	0	4637	0	0	0	$4,637	0	$4,637

1.3: Submit data to funding agency (12 months)	0	0	0	0	487	0	0	0	$487	0	$487
1.4: Prepare data reports (12 months)	0	0	0	0	3516	0	0	0	$3,516	0	$3,516
1.5: Compile research findings (12 months)	0	0	0	0	16173	0	0	0	$16,173	0	$16,173
1.6: Participate in workshops, seminars, and conferences (12 months)	0	0	0	0	8048	0	0	0	$8,048	0	$8,048
2.1: Sample outmigrating salmonids (12 months)	0	0	0	0	80144	0	0	0	$80,144	0	$80,144
2.2: Estimate trap efficiency (12 months)	0	0	0	0	20610	0	0	0	$20,610	0	$20,610
2.3: Estimate number of migrating Chinook (12 months)	0	0	0	0	7697	0	0	0	$7,697	0	$7,697
3.1: Estimate juvenile production per spawner (12 months)	0	0	0	0	3338	0	0	0	$3,338	0	$3,338
3.2: Estimate juvenile survival (12 months)	0	0	0	0	153	0	0	0	$153	0	$153

3.3: Monitor environemntal variables (12 months)	0	0	0	0	5774	0	0	0	$5,774	0	$5,774
Totals	**$0**	**$0**	**$0**	**$0**	**$159,376**	**$0**	**$0**	**$0**	**$159,376**	**$0**	**$159,376**

Year 3 (Months 25 To 36)

Task	Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of Way	Other Direct Costs	Direct Total	Indirect Costs	Total
1.1: project management (12 months)	0	0	0	0	9239	0	0	0	$9,239	0	$9,239
1.2: Bi−weekly sampling summaries (12 months)	0	0	0	0	4869	0	0	0	$4,869	0	$4,869
1.3: Submit data to funding agency (12 months)	0	0	0	0	512	0	0	0	$512	0	$512
1.4: Prepare data reports (12 months)	0	0	0	0	3692	0	0	0	$3,692	0	$3,692
1.5: Compile research findings (12 months)	0	0	0	0	16981	0	0	0	$16,981	0	$16,981
1.6: Participate in workshops, seminars, and conferences (12 months)	0	0	0	0	8450	0	0	0	$8,450	0	$8,450

2.1: Sample outmigrating salmonids (12 months)	**0**	**0**	**0**	**0**	**84152**	**0**	**0**	**0**	$84,152	**0**	$84,152
2.2: Estimate trap efficiency (12 months)	**0**	**0**	**0**	**0**	**21641**	**0**	**0**	**0**	$21,641	**0**	$21,641
2.3: Estimate number of migrating Chinook (12 months)	**0**	**0**	**0**	**0**	**8082**	**0**	**0**	**0**	$8,082	**0**	$8,082
3.1: Estimate juvenile production per spawner (12 months)	**0**	**0**	**0**	**0**	**3505**	**0**	**0**	**0**	$3,505	**0**	$3,505
3.2: Estimate juvenile survival (12 months)	**0**	**0**	**0**	**0**	**161**	**0**	**0**	**0**	$161	**0**	$161
3.3: Monitor environemntal variables (12 months)	**0**	**0**	**0**	**0**	**6062**	**0**	**0**	**0**	$6,062	**0**	$6,062
Totals	**$0**	**$0**	**$0**	**$0**	**$167,346**	**$0**	**$0**	**$0**	**$167,346**	**$0**	**$167,346**

Budget Justification

Assessment of project specific and cumulative effects of restoration on Stanislaus River juvenile chinook production

Labor

Tri−dam will provide labor as in−kind service to the project. See Services and Consultants for description of labor for project.

Benefits

Tri−dam will provide labor as in−kind service to the project. See Services and Consultants for description of benefits for project.

Travel

No travel expenses will be incurred by the applicant. See Services and Consultants for travel expenses related to the project.

Supplies And Expendables

No supplies or expendable will be purchased by the applicant. See Services and Consultants for supplies and expendables related to the project.

Services And Consultants

A detailed table of costs provided by the sub−contractor are attached to the proposal. Please refer to this table for a breakdown of each task. Details are also listed below. Years 2 and 3 are the same as year one, except that a 5% increase is applied to each year.

Labor:

S.P. Cramer &Associates (SPC) will be used to perform all field activities and synthesis of the data collected. They will be used on all tasks listed in the proposal with the exception of portions of Task 1.1. For task 1.1 SPC will provide technical insight and oversee that objectives and tasks are being met and deliverables produced. This task will require 40 hours of senior consultant and 40 hours of Biologist II time for each year of the project. Task 1.2 will require 40 hours of Biologist I time, 12 hours of Biologist III time and 6 hours of senior consultant time for each year of the project. This task includes summarizing and reporting on preliminary data to keep resource managers updated on a real−time basis. Task 1.3 will require 8 hours technician time and 1 hour Biologist I time for each year of the project to organize final summarized data and provide a electronic and hard copy of raw data to the funding agency. Task 1.4 will require 40 hours technician time, 20 hours Biologist I time, and 2 hours Biologist II time for each year of the project to prepare an annual data report consisting of summarized data, graphs and tables. Task 1.5 will require 20 hours Biologist I time, 50 hours Biologist II time, 40 hours Biologist III time and 48 hours senior consultant time for each year of the project to prepare draft and final comprehensive annual reports. Task 1.6 will require 10 hours Biologist I time, 20 hours Biologist II time, and 40 hours of Senior Consultant time to participate in workshops, seminars and conferences each year of the project. A large portion of this task includes preparing Power Point presentations of the study findings, which will be delivered by the Senior Consultant to interested forums.

Task 2.1 will require 1,100 hours technician time for two technicians to monitor the rotary screw traps 7 days per week a minimum of one time per day for 5 months each year. It also includes monitoring the trap at night a significant amount of the time to ensure the trap is functioning properly and to remove fish from the trap during high abundance periods. Task 2.1 will also require 60 hours Biologist I time, 60 hours Biologist II and 60 hours Senior Consultant time to coordinate and supervise activities with field staff for each year of the project. Task 2.2 will require 200 hours technician time to

perform trap efficiency releases twice per week for a 5 month period each year. Task 2.2 also includes 40 hours Biologist I time, 40 hours Biologist II time, 10 hours Biologist III time and 10 hours Senior Consultant time to coordinate activities, analyze results and supervise field staff each year of the project. Task 2.3 will require 10 hours Biologist I time, 20 hours Biologist II time, 20 hours Biologist III time and 24 hours Senior Consultant time to develop an outmigration index for each year of the project based on catch, trap efficiency relults and environmental data.

Task 3.1 will require 7 hours of Biologist I time, 7 hours Biologist II time, 8 hours Biologist III time and 10 hours Senior Consultant time to estimate juvenile production per spawner based on escapement estimates and outmigration estimates. Task 3.2 will require 1 hour Biologist I time and 1 hour Biologist II time to estimate in−river survival between the two trapping sites for each year of the project. Task 3.3 will require 88 hours technician time, 8 hours Biologist I time, and 8 hours Biologist II time for each year of the project. This task includes downloading of thermographs at 7 location in the Stanislaus River every 2 months, summarizing the data and importing into Access database.

The compensation rate with burden for each of the categories mentioned above are $54.67/hr for Senior Consultant, $48.60 for Biologist III, $42.73 for Biologist II, $30.51 for Biologist I and $23.26 for technicians for the first year. Year 2 and 3 will be a 5% increase over these rates to reflect cost of living increase and inflation. Compensation with burden includes taxes, workman's compensation and estimated bonuses.

Benefits: The calculated benefit rate per hour worked includes vacation and holiday pay, medical/dental/life insurance and pension.

The benefit rate per hour for the first year for a senior consultant is $14.54, for Bio III $11.78, for Bio II $10.63, for Bio I $6.98, and for technicians $6.14. Year 2 and 3 will have a 5% increase for cost of living and inflation.

Indirect Costs/Overhead: The indirect cost consists of overhead plus 10% profit of the billing rate for each of the employee categories listed above under labor and benefits. Overhead varies depending on employee position, but is approximately 17%. Overhead for Senior Consultant is $46.15/hr, for Biologist III is $40.50/hr, for Biologist II is $35.71/hr, for Biologist I is $19.15/hr and for technicians is $15.38/hr. The overhead includes items such as administrative personnel (invoicing, payroll, etc.), depreciation on equipment, liability insurance, building maintenance, rent, utilities, furniture, legal expenses, accounting, phones, etc.

The billing rates are $115.39 for senior consultant, $100.63 for Bio III, $89.11 for Bio II, $56.65 for Bio I and $44.69 for technicians for the first year of the project. Years 2 and 3 will have a 5% increase for cost of living and inflation for the billing rates.

The amount in each task of the project will be increased by 5% for years 2 and 3 to account for inflation, cost of living and merit increases. This should also be applied to the compensation and benefit rates above.

Travel: A total of $9,700 per year is included to cover cost of traveling to and from project sites, to download thermographs at 7 locations in the Stanislaus River and to attend workshops, seminars and conferences. Travel includes mileage to travel to and from the site twice per day for 5 months. The project site is approximately 30 miles from the SPC field office, which would equal 60 miles round trip. The project site may be visited more than one time per day on most occasions, and may even include 3–4 visits during heavy debris loads and high fish abundance. A small amount has also been included for travel and lodging needed by the Senior Consultant for site visits during annual monitoring. For years 2 and 3 travel expenses are budgeted for a 5% increase per year to account for increase costs (i.e. gas).

Supplies and Expendables:

The total amount budgeted for supplies and expendables for the

first year is $7,000. Expenses for task 2.1 include maintenance and replacement of field equipment such as buckets, waterproof paper, nets, waders, thermometers, trap cleaning supplies, warning signs, locks, digital cameras, batteries, etc. Office supplies for the project are expected to cost approximately $500 for the first year and will include the materials for report creation and distribution, data sheet organization and storage, copies, toner, etc. Communication costs associated with long-distance calls (including conference calls) and cellular phone usage are expected to cost approximately $200 per month ($2,400 per year). Task 1.2 includes the cost of a website domain name and yearly charges. The cost of the website is split with other on-going projects on the Stanislaus River, therefore there will be a cost saving for this expense.

For years 2 and 3 the expenses are the same but are estimated to cost approximately 5% more per year to account for inflation.

Equipment

No equipment expenses will be incurred for the project.

Lands And Rights Of Way

Not applicable

Other Direct Costs

None

Indirect Costs/Overhead

Indirect and overhead costs for administration services will be provided by the applicant as a cost-share. See Services and Consultants for indirect costs and overhead for sub-contractor.

Comments

Tri−dam project will provide in−kind administration services at a cost of approximately $10,000 per year to administer the contract and funds. This will also include labor to assist with trap installation and removal, which is part of task 2.1. They will also provide a total of $422,177 over the three year period for monitoring at the upstream trapping site.

Environmental Compliance

Assessment of project specific and cumulative effects of restoration on Stanislaus River juvenile chinook production

CEQA Compliance

Which type of CEQA documentation do you anticipate?
X none
− negative declaration or mitigated negative declaration
− EIR
− categorical exemption

If you are using a categorical exemption, choose all of the applicable classes below.
− Class 1. Operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The types of "existing facilities" itemized above are not intended to be all−inclusive of the types of projects which might fall within Class 1. The key consideration is whether the project involves negligible or no expansion of an existing use.
− Class 2. Replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced.
− Class 3. Construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure. The numbers of structures described in this section are the maximum allowable on any legal parcel, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.
− Class 4. Minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.
− Class 6. Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies. These may be strictly for information

gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded.
– Class 11. Construction, or placement of minor structures accessory to (appurtenant to) existing commercial, industrial, or institutional facilities, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

Identify the lead agency.

Is the CEQA environmental impact assessment complete?

If the CEQA environmental impact assessment process is complete, provide the following information about the resulting document.

Document Name
State Clearinghouse Number

If the CEQA environmental impact assessment process is not complete, describe the plan for completing draft and/or final CEQA documents.

NEPA Compliance

Which type of NEPA documentation do you anticipate?
X none
– environmental assessment/FONSI
– EIS
– categorical exclusion

Identify the lead agency or agencies.

If the NEPA environmental impact assessment process is complete, provide the name of the resulting document.

If the NEPA environmental impact assessment process is not complete, describe the plan for completing draft and/or final NEPA documents.

Successful applicants must tier their project's permitting from the CALFED Record of Decision and attachments providing programmatic guidance on complying with the state and federal endangered species acts, the Coastal Zone Management Act, and sections 404 and 401 of the Clean Water Act.

Please indicate what permits or other approvals may be required for the activities contained in your proposal and also which have already been obtained. Please check all that apply. If a permit is *not* required, leave both Required? and Obtained? check boxes blank.

Local Permits And Approvals	Required?	Obtained?	Permit Number (If Applicable)
conditional Use Permit	–	–	
variance	–	–	
Subdivision Map Act	–	–	
grading Permit	–	–	
general Plan Amendment	–	–	
specific Plan Approval	–	–	
rezone	–	–	
Williamson Act Contract Cancellation	–	–	
other	–	–	

State Permits And Approvals	Required?	Obtained?	Permit Number (If Applicable)
scientific Collecting Permit	X	X	
CESA Compliance: 2081	–	–	
CESA Complance: NCCP	–	–	
1602	–	–	
CWA 401 Certification	–	–	
Bay Conservation And Development Commission Permit	–	–	
reclamation Board Approval	–	–	
Delta Protection Commission Notification	–	–	
state Lands Commission Lease Or Permit	–	–	

action Specific Implementation Plan	**–**	**–**	
other	**–**	**–**	

Federal Permits And Approvals	**Required?**	**Obtained?**	**Permit Number (If Applicable)**
ESA Compliance Section 7 Consultation	**–**	**–**	
ESA Compliance Section 10 Permit	**X**	**–**	
Rivers And Harbors Act	**–**	**–**	
CWA 404	**–**	**–**	
other	**–**	**–**	

Permission To Access Property	**Required?**	**Obtained?**	**Permit Number (If Applicable)**
permission To Access City, County Or Other Local Agency Land Agency Name	**–**	**–**	
permission To Access State Land Agency Name	**–**	**–**	
permission To Access Federal Land Agency Name	**–**	**–**	
permission To Access Private Land Landowner Name	**–**	**–**	

If you have comments about any of these questions, enter them here.

The proposed project is a research project only.

Below is a list of valid Scientific Collecting Permits for SPC. Permits of current employees will be renewed prior to expiration date.

Name Permit # Expiration Andrea Fuller 801131-05 11/09/06 Rob Fuller 801131-04 11/09/06 Mike Justice 801018-03 04/30/06 Ryan Cuthbert 801137-05 11/09/06 Chrissy Sonke 801137-01 11/09/06 Doug Demko 801131-03 11/09/06 Ryan Fuller 801137-02 11/09/06

Jesse Anderson 801222−01 10/02/05 Jim Inman 801043−04 04/30/06 Gabe Kopp 801043−05 04/30/06

Land Use

Assessment of project specific and cumulative effects of restoration on Stanislaus River juvenile chinook production

Does the project involve land acquisition, either in fee or through easements, to secure sites for monitoring?
X No.
– Yes.

How many acres will be acquired by fee?

How many acres will be acquired by easement?

Describe the entity or organization that will manage the property and provide operations and maintenance services.

Is there an existing plan describing how the land and water will be managed?
– No.
– Yes.

Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?
– No.
X Yes.

Describe briefly the provisions made to secure this access.

We have obtained access through a private landowners orchard to get to our site. We have had permission to access through his land since 1995.

Do the actions in the proposal involve physical changes in the current land use?
X No.
– Yes.

Describe the current zoning, including the zoning designation and the principal permitted uses permitted in the zone.

Describe the general plan land use element designation, including the purpose and uses allowed in the designation.

Describe relevant provisions in other general plan elements affecting the site, if any.

Is the land mapped as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance under the California Department of Conservation's Farmland Mapping and Monitoring Program?
X No.
– Yes.

Land Designation	Acres	Currently In Production?
Prime Farmland		–
Farmland Of Statewide Importance		–
Unique Farmland		–
Farmland Of Local Importance		–

Is the land affected by the project currently in an agricultural preserve established under the Williamson Act?
X No.
– Yes.

Is the land affected by the project currently under a Williamson Act contract?
– No.
– Yes.

Why is the land use proposed consistent with the contract's terms?

Describe any additional comments you have about the projects land use.