

Summary Information

California State University, Chico

Butte Creek spring–run chinook salmon life history investigation

Amount sought: \$513,281

Duration: 36 months

Lead investigator: Mr. Paul Ward, California Department of Fish and Game

Short Description

This project, a partnership between California State University, Chico Research Foundation and the California Department of Fish and Game, will continue the Butte Creek spring–run Chinook salmon (SRCS) life history investigation for an additional three years. This project is located on Butte Creek, in Butte County, California near Chico. The objective is to continue development of an SRCS adult escapement estimate that will serve as a reliable and more precise "recovery–metric" providing a measure of overall restoration effectiveness and as a measure of recovery for the listed SRCS.

Executive Summary

This proposal, a partnership between California State University, Chico Research Foundation and the California Department of Fish and Game, will continue the Butte Creek spring–run Chinook salmon (SRCS) life history investigation for an additional three years. Project is located on Butte Creek, in Butte County, California near Chico. Proposal objective is to continue development of an SRCS adult escapement estimate that will serve as a reliable and more precise "recovery–metric" providing a measure of overall restoration effectiveness and as a measure of recovery for the listed SRCS. Butte Creek presently harbors the largest of several Central Valley tributary wild SRCS populations. Significant restoration actions have been completed and are in progress in the Butte Creek watershed. Included are 5 juvenile fish screens, 11 fish ladders, removal of 4 diversion dams, acquisition of 40 cfs dedicated for instream flow, installation/operation of 10 flow monitoring stations, acquisition of riparian areas, initiation of a Watershed Conservancy, and completion of a Butte Creek Existing Conditions and Management Strategy Report. Total expenditures on Butte Creek restoration efforts since 1993, exceed \$33 million.

Proposal is seeking \$513,281 over three years to refine adult SRCS escapement estimates. Included is evaluation of efficacy/precision of current SRCS snorkel surveys, development of an estimate and assessment of SRCS pre-spawn mortalities and an estimate and assessment of SRCS spawning, using a standard population assessment method and model as developed by Schaefer (1951). Necessary components include continued juvenile SRCS monitoring and coded-wire tagging of up to 400,000 juvenile SRCS each year for 2006 and 2007. Additionally, a similar estimate will be completed for fall-run Chinook salmon (FRCS), primarily to assess impacts of straying.

This proposal directly addresses ERP Draft Stage 1 Implementation Plan and Ecosystem Restoration Plan, Goal 1, Recovery of At-risk Species. SRCS are among species designated “R” in the Multi-Species Conservation Strategy (MSCS) that establishes a goal to recover that species within the CALFED ERP ecological management zones. Project has and is implementing the CVPIA AFRP Evaluation #14 for Butte Creek to evaluate juvenile life history of Butte Creek SRCS. The Butte Creek research project is the only project within the Central Valley that is developing large-scale life history metrics derived directly from evaluation of wild SRCS. This research project, while located within the Butte Creek watershed and specifically targeting Butte Creek SRCS, is also providing baseline data for recovery/restoration and management of existing and other potential Central Valley SRCS populations. The current research project is providing key input to several recovery and management efforts including: 1) NOAA Fisheries led Central Valley Technical Recovery Team effort developing status and recovery plans for Central Valley spring-run Chinook Salmon, 2) Interagency Ecological Program Delta Operations Group Sacramento River Spring-run Chinook Salmon Protection Plan, and 3) NOAA Fisheries led workgroup developing management goals and recommendations to the Pacific Fishery Management Council for potential amendments to the Pacific Coast Salmon Plan.

A. Project Description: Project Goals and Scope of Work

1. Problems, Goals and Objectives –

Central Valley salmon and steelhead populations began a precipitous decline in the late 1960's resulting in the listing of winter (WRCS) and spring-run Chinook salmon (SRCS) (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*) under the respective state and federal endangered species acts. Butte Creek is one of several Central Valley creeks that continue to harbor a sustaining and genetically distinct population of wild SRCS. Several state and federal restoration plans were developed to address the problem including the California Department of Fish and Game (CDFG), Restoring Central Valley Streams: A Plan for Action (1993), and the U.S. Fish and Wildlife Service, Draft Anadromous Fish Restoration Plan (AFRP) (1995). Each plan specifically identified multiple restoration actions within the Butte Creek watershed believed necessary to achieve the goal of recovering and maintaining viable populations of anadromous fish with primary emphasis directed at recovery of SRCS. Most of the actions were incorporated into the CALFED Ecosystem Restoration Program Plan (ERPP) (1998). As stated in the subsequent CALFED Strategic Plan for Ecosystem Restoration Program (2000), one of the basic goals as articulated in and distilled from the earlier restoration programs, is to ***“Achieve recovery of at-risk native species ...”***

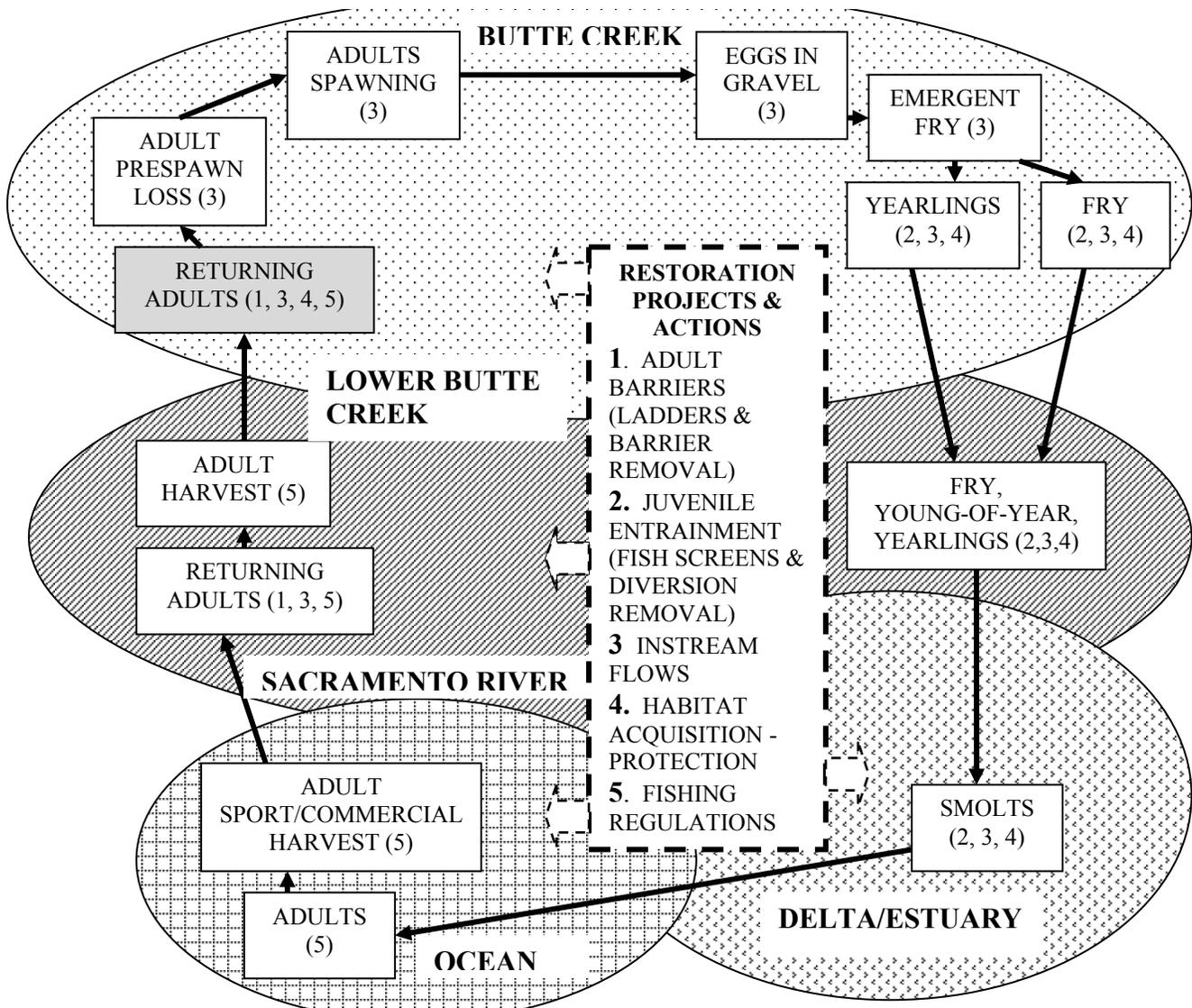
Restoration actions implemented under the various plans mentioned above began in about 1993 largely under the auspices of the Central Valley Project Improvement Act (CVPIA) and the Bay-Delta Accord Category III Program. The CALFED table of previously-funded ERP Restoration Actions as currently included with this grant process (CALFED PSP Tools) lists 14 projects in the Butte Creek watershed. Among the 14 are 3 that have provided for land acquisition and riparian protection (ERP-97-N06, ERP-98-F03, ERP-98-F24), and two which have provided for acquisition and monitoring of instream flows (ERP-95-M05, ERP-01-C02). Additionally, there are 7 projects which collectively have completed 10 fish ladders and weir modifications for adult passage, 3 fish screens, and removal of 4 dams which were barriers to passage (ERP-01-N16, ERP-01-N54, ERP-02-P07, ERP-95-M02, ERP-95-M03, ERP-96-M01, ERP-97-M04). Finally, there is one project completed that provided for development of a local watershed education curriculum (EPP-01-N35). Additionally, one project is in progress that will complete two fish ladders and weir modifications for adult passage and one juvenile fish screen (ERP-01-N53), and one project which will potentially result in a barrier removal and additional acquisition of instream flows (ERP-01-N54). A more comprehensive list of restoration actions, inclusive of the CALFED listed projects, is attached and includes a list of implementing/funding partners and a location map (Attachment A). In the aggregate, to date over \$33 million has been expended within the Butte Creek watershed since about 1993 for the purpose of watershed restoration and recovery of anadromous fish populations, with specific emphasis on SRCS.

While each of the completed and in-progress restoration actions has a specific individual measure of effectiveness, the fundamental overall “recovery-metric” is the annual SRCS escapement estimate. The specific objective of this proposal is to continue key elements of the existing SRCS life history evaluation, primarily to refine and validate this metric and its components as a measure of the collective effectiveness of the entire Butte Creek restoration effort. The AFRP baseline period (1967-1991) average escapement estimate for Butte Creek SRCS was 360 adults, ranging from approximately 10 in 1979 to 1371 in 1986, as calculated from CDFG estimates based upon various survey methods. The average escapement estimate since initiation of restoration, for the period 1993-2003 has been 5,588 adults with a low of 474 in 1994 and a high of 20,212 in 1998 as developed by CDFG based upon a consistent snorkel survey method.

2. Justification –

Multiple restoration projects/actions have been completed that directly affect Butte Creek SRCS. Restoration projects/actions, although largely concentrated within the Butte Creek watershed, also encompass the entire migratory route, including the Sacramento River, Delta and Ocean. Each project/action has a potential discrete measure of success. The following diagrammatic conceptual model (Figure 1) details key life-history stages.

Figure 1. Butte Creek Research Project Conceptual Model



Hatched ovals represent the four key geographical areas.
Restoration projects/actions are categorized by type of activity.
Boxes connected by arrows represent discrete spring-run Chinook salmon life stage by location, with potential affect of restoration action(s).

Each stage has a theoretical potential to be measured and quantified, and to represent with varying degrees of precision, the objective of SRCS restoration/recovery. However, demonstration of overall

restoration/recovery of Butte Creek SRCS requires a metric that encompasses all restoration projects/actions. The basic metric most easily measured and most representative of restoration/recovery is one that measures adult escapement. This project will continue refinement of adult escapement estimates related to overall inland return, pre-spawn mortality and total number of adults spawning.

3. Previously Funded Monitoring --

The ongoing Butte Creek life history evaluation was initiated in 1995, funded by various grant programs including the CVPIA AFRP, and the CALFED ERP. General project objectives include: 1) documentation of spawning onset, duration, and location, 2) time and duration of emergence, 3) age at onset, and duration of juvenile emigration, 4) growth and residence time in the Butte Creek watershed, 5) emigration duration and route through the lower river and Delta, 6) ocean distribution and harvest, 7) inland escapement, age structure, and straying, 8) evaluation of pre-spawn mortalities.

The project is currently funded through December 31, 2005 (CALFED ERP Project 01-N49 as amended) and AFRP (#11332-4-J001). Project results are summarized in annual reports since 1999 (Hill and Webber, 1999; Ward and McReynolds, 2004; Ward et al., 2004a, 2004b, 2004c, 2004d). Key findings to date include:

Spawning and Emergence

- Spawning documented from first week of September to last week of October.
- Majority of spawning occurs in upper 5.5 miles of 11.25 mile spawning and holding reach.
- At current population levels spawning gravel is over-utilized in upper 5.5 miles and under-utilized in lower 5.75 miles.
- Emergence occurs from mid-November to late April, although April emergents may be late fall-run Chinook.

Emigration and Growth

- Emigration is primarily as young-of-the-year (YOY) at an average fork length of 30-45 mm.
- A very small proportion of juveniles emigrate as yearlings from October through June at an average fork length of 85 – 160 mm.
- YOY emigrants spend from less than a week to over four months in lower Butte Creek including the Sutter Bypass.
- YOY emigrant growth rates vary from approximately 0.35 mm/day to over 0.8 mm/day.
- YOY emigrants are seen exiting the Delta during April through June, approximately two to six months from time of release near Chico.
- YOY emigrants captured exiting the Delta vary in length from approximately 63 to over 95 mm fork length.

Ocean distribution, harvest and Inland Escapement

- Ocean sport/commercial harvest rate estimates ((catch)/(catch + escapement)) were 47% and 43% for Brood Year 98 and Brood Year 99, respectively.
- Returns from ocean sport/commercial harvest have been confirmed from south of Monterey off the California coast to marine area-two off the Washington coast.
- Annual snorkel escapement survey estimates since 1995 have varied from 635 adults in 1997 to 20,212 adults in 1998.
- Annual snorkel surveys during 2001-03 were 9,605, 8785, and 4,398 adults respectively, while Schaefer model carcass surveys for the same period were 18,312, 12,597 and 6,063 adults.

- Official annual escapement estimates are based upon snorkel surveys which seem to significantly underestimate actual escapement.
- Age at spawning varies from age-2 to age-4, with an estimated 69% of the population at age-4 in 2003.
- Fish that emigrate as yearlings contribute to the ocean/sport harvest/inland escapement at a significantly higher rate than those that emigrate as YOY, although overall harvest/escapement is primarily supported by YOY emigrants due to the significantly larger numbers.
- Inland straying into other watersheds is small, with only two recoveries, one at the Feather River Hatchery and one in Clear Creek.

Pre-spawn Mortalities –

- Butte Creek generally exhibits water temperatures during the summer holding period that exceed ideal temperatures for holding salmon (17° C).
- Pre-spawn mortalities were observed during 2002 (3,431 adults) and systematically evaluated using a Schaefer model carcass survey during 2003 (11,231 adults).
- Pre-spawn mortalities are the result of large numbers of fish, higher than normal water temperatures and disease (columnaris and Ich).
- Butte Creek has, and continues to support the largest of the three natural sustaining populations of SRCS, in spite of adverse water temperatures.

4. Approach and Scope of Work –

Location of Project: This project is located in Butte County, California near Chico. Project area includes Butte Creek downstream of the Centerville Head Dam (39.867282° N/ 121.632897° W) to the Western Canal Water District siphon (39.55586° N/121.83549° W) attached map (Figure 2).

Approach: There are three main focus areas, Task 1 a-d - Adult escapement surveys, Task 2 - Juvenile monitoring, and Task 3 - Coded-wire tagging.

Task 1-a. Adult spring-run snorkel escapement survey -

Since inception of the project in 1995, each year during mid to late-July an adult SRCS escapement estimate has been developed by conducting a snorkel survey of the entire holding reach of Butte Creek. This proposal will continue that survey for three additional years. On Butte Creek, the survey extends from the PG&E Centerville Head Dam to the Parrott-Phelan Diversion Dam (PPDD) (Figure 2). The survey is conducted over four days, each covering a discrete reach. Survey is conducted by three to four experienced individuals. Each pool is observed only once, with each individual independent estimate recorded. Individual estimates are averaged with the total escapement estimate calculated by summing the averages for observations of each of the pools. Currently, the escapement estimate generated by the snorkel survey serves as the officially reported estimate for all regulatory purposes under state and federal law and as a measure of population trends.

Task 1-b. Adult spring-run pre-spawning mortality survey -

With the increased populations of Butte Creek SRCS since 1995, there were reports and observations of significant mortalities during summer holding periods prior to spawning. The current project first documented SRCS pre-spawning mortalities during 2002. Because this was

an unforeseen task under the previous CALFED grant, insufficient funds existed to adequately develop an estimate of the total mortalities. The Pacific Gas and Electric (PG&E) DeSabra–Centerville hydropower project is located in the SRCS holding/spawning reach of Butte Creek. Based upon concerns for project impacts to SRCS, PG&E agreed to provide funds to assess the magnitude of the pre-spawn mortalities during 2003 and 2004, and has tentatively agreed to fund surveys through project year 2007. For project year 2008, additional funds will be necessary and are reflected in this proposals budget. Pre-spawn mortality surveys are started as early as June when water temperatures begin to increase and continue through onset of spawning, generally mid-September. The survey area extends from the Quartz Bowl Pool, the uppermost reach of adult salmon migration, to the PPDD (Figure 2). The approximately 11 mile-long stream section is divided into sub-reaches, with each surveyed weekly. Under conditions where the number of pre-spawn mortalities is large, an estimate of total mortalities will be generated using a standard population model employed in the Central Valley. Previous estimates were developed using a method and model developed by Schaefer (1951) and will be employed for this proposal as follows:

$$E=N_{ij} = R_{ij} (T_i C_j / R_i R_j) - T_i$$

Where:

E = Total run size

N_{ij} = Population size in tagging period i recovery period j,

R_{ij} = number of carcasses tagged in the ith tagging period and
Recaptured in the jth recovery period,

T_i = number of carcasses tagged in the ith tagging period

C_j = number of carcasses recovered and examined in the jth recovery
Period,

R_i = total recaptures of carcasses tagged in the ith tagging period, and

R_j = total recaptures of tagged carcasses in the jth recovery period.

Mortalities are counted, sexed, measured, observed for adipose fin-clip, and then chopped in half to avoid counting on subsequent surveys. Heads are excised from mortalities with an adipose fin-clip and returned to the Chico Office where tags are removed.

Task 1-c. Adult spring-run spawning escapement survey -

The primary objective of the spawning survey is to develop an adult escapement estimate using a standard mark-recapture method and model, and to recover coded-wire tags (CWT's) from adults tagged and released in Butte Creek during previous years. Spawning surveys using a standard mark-recapture method and model were first implemented in 2001. Escapement estimates generated by the mark-recapture method have been significantly higher than estimates generated by the annual snorkel surveys; in some years by as much as 50%. This proposal will continue both surveys to provide a baseline comparison of the two methods, and to provide a more precise estimate for SRCS recovery. The SRCS spawning survey encompasses the 11 mile-long stream section and methodology employed in the pre-spawn mortality survey (Task 1-b), including developing a total spawning estimate using the model developed by Schaefer (1951).

Additionally, tissue samples will be taken from the first ten fresh carcasses encountered. All collected tissue samples will be archived for future analysis. Adipose-fin clipped carcasses will be measured to the nearest mm fork-length, heads removed, a head tag number assigned and each

head placed into a zip-lock bag. Heads will be frozen for later recovery of the CWT's. While removing CWT's from the heads, otoliths will be extracted and archived with the previously taken tissue samples. Data recorded from the fresh carcasses will include gender, fork length, and the reach of the stream in which each carcass was observed.

Task 1-d. Adult fall-run spawning escapement survey -

FRCS carcass surveys using the standard methodology and model of Schaefer (1951) have been conducted since 2003. FRCS enter Butte Creek as early as late September and spawn during mid-October through mid-December. FRCS generally spawn in the 10-mile reach of Butte Creek from the PPDD to the Western Canal Siphon (Attached map). A FRCS carcass survey will be continued annually using the method and model of Schaefer (1951) as described under Task 1-b. During previous surveys FRCS CWT's were collected and indicate that the majority of Butte Creek's FRCS population is composed of out-of-watershed strays. This project will continue FRCS surveys to continue an annual estimate of FRCS spawning escapement and to develop a better understanding and estimate of straying and potential impacts to the listed SRCS.

Task 2. Juvenile Monitoring -

Juvenile monitoring has been performed since project inception. Initial objectives were to: 1) identify and monitor time of emergence, 2) monitor and document juvenile size at emigration, and 3) develop a measure of relative abundance. This proposal will continue juvenile monitoring for two additional years specifically to: 1) continue documentation of onset and duration of yearling and YOY emigration, and 2) capture up to 400,000 YOY for CWT project, Task 3. Juvenile SRCS will continue to be trapped at PPDD, using one or two 8-foot diameter rotary screw traps manufactured by EG Solutions (Eugene, Oregon), and a 4 ft x 3 ft x 7 ft fyke trap located at the apex of a fish screen located in the diversion canal. All traps will be adjusted daily, or more often as needed, to allow for safe operation and access as well as to maximize trapping efficiency. The PPDD site is directly downstream of the SRCS spawning reach and upstream of the FRCS spawning reach, although periodically some FRCS spawn above the site (Figure 2). Traps will continue to be fished 24 hours per day, 7 days per week and will be checked daily, or more frequently as conditions warrant. All fish will be netted from trap live-wells and immediately placed in buckets of fresh river water. Salmonids will be immediately sorted from other species, segregated into separate buckets, and processed. A random sub-sample of 50 salmon juveniles will be measured to the nearest mm FL, transferred to a wetted container on an electronic scale and weighed to the nearest gram. Beginning in January, juvenile SRCS captured at the site will be held in pens for subsequent tagging with a CWT. All fish will be saved for tagging, unless daily trap numbers are exceptionally high making processing time extremely long (> 5 days). Fish not saved for tagging will be released back into Butte Creek immediately below the site. Butte Creek SRCS juvenile emigration monitoring is a component of the IEP Delta Operations Group Sacramento River Spring-run Chinook Salmon Protection Plan. All data will continue to be entered into the IEP database and exported weekly for use by the appropriate agencies.

Task 3. Coded-Wire Tagging -

Coded-wire-tagging, was initiated in 1995 and has to date tagged over 740,000 juvenile Butte Creek wild SRCS. Tagged juveniles have been monitored through their residence in lower Butte Creek, Sacramento River and Delta, ocean sport/commercial harvest, and adult inland escapement (2001-

2004). Various metrics based upon tag recoveries have advanced the general knowledge of Central Valley SRCS life history and are integral to the SRCS recovery and ocean fishery management plan amendment process led by NOAA Fisheries. Of particular importance has been identification of the very large contribution of YOY, protracted inland residency extending into June, ocean sport/commercial harvest (catch/(catch+escapement)) of approximately 50%, and inland escapement and age (age-3 and age-4).

For the period 1998-2003, the annual goal was to tag up to 100,000 juveniles, which was increased to 200,000 for 2004. For 2005, and the first two years of this proposal, the annual goal will be to release up to 400,000 marked juvenile SRCS. To date, there have been a relatively small number of recoveries which is likely a result of tagging fry (<40mm). The objective is to increase the number of marked SRCS to increase the precision of ocean/inland harvest and escapement estimates. The third year of the proposal will focus only on the escapement surveys for recovery of the previously released tags. Subsequently, for the period 2009-2011, the project will seek an additional three years of funding for recovery of previously released tags, at which time the project will terminate. Accurate escapement and harvest estimates are imperative for the recovery and eventual delisting of SRCS under the respective endangered species acts. Additionally, Butte Creek data are a critical component of the ongoing evaluation of a potential amendment to the Pacific Fishery Management Council Pacific Coast Salmon Plan to specify long-term conservation objectives.

A qualified sub-contractor selected by competitive bid and under the direct supervision of CDFG project personnel will complete the tagging of up to 400,000 fish. All fish will be transported from the PPDD sampling site to a tagging trailer located at the Baldwin Construction Yard, approximately one mile downstream of PPDD. Juvenile salmon will be marked using a Northwest Marine Technology Tag Injector Model MKIV and Model MKIV Quality Control Device (QCD). All but a sub-sample of 100 tagged fish will be recovered in fresh water and released into Butte Creek adjacent to the Construction Yard. The remaining sub-sample will be held for 24 hours, re-run through the QCD to determine tag retention rate, and then released.

5. Feasibility --

This project as proposed continues the existing Butte Creek component of the Spring-run Chinook Salmon Life History Evaluation, currently in its ninth year. The approaches previously described have proven to be effective methods for the documentation of SRCS life history strategies. Meeting the project objectives as stated in this proposal should be attainable within the three-year time frame which will significantly contribute to the goal of developing a reliable "recovery metric" for SRCS. Task 1(a-d), adult escapement activities should be able to be completed under all circumstances. Task 2, juvenile monitoring will be dependent upon weather conditions, and as in the past will be adjusted dependent upon high water, excessive debris, and the potential for injury to personnel or damage to sampling gear. Task 3, coded-wire tagging will be dependent upon the availability of juvenile SRCS and will tag as many as captured up to the 400,000 goal. Various factors have and will affect the number of juvenile SRCS captured, including the adult spawning population, egg to fry survival, and the number and duration of high flows where traps are removed or trapping efficiency is reduced.

Project activities are currently authorized under a NOAA Fisheries 4(d) rule for two affected ESU's; Central Valley Spring-run Chinook and Central Valley Steelhead. Additionally, the project is covered under a NOAA Fisheries Section 10(a)(1)(A) Research Permit (No. 1407) through June 30, 2009.

6. Expected Outcomes and Products --

CDFG's project manager will prepare and submit quarterly progress reports. Progress reports will be submitted to CALFED by the 10th day of the month following the end of the quarter. Quarterly reports will include project fiscal information, progress toward achieving the Tasks stated in this proposal, and any problems and/or delays encountered. If needed, a description of any modifications to the project contract will be outlined. Annual reports will be prepared and submitted by the end of the first quarter of the subsequent year. A project final report will be prepared and submitted. This final report will be a comprehensive report summarizing findings and conclusions since project inception in 1995.

CDFG project staff regularly make presentations at meetings, science conferences, workshops, and educational programs. CDFG project staff are also participants in local watershed groups, and agency workgroups such as the Delta sub-team of the Interagency Ecological Program, the Central Valley Spring and Winter-run Chinook Harvest Management Team, and the Salmon Escapement Project Work Team.

7. Data Handling, Storage and Dissemination –

Field sampling data collected under Task 1 are entered into a Microsoft database located in the Chico field office. Field sampling data collected under Task 2 are entered into a relational database at least once per week and are exported to the Interagency Ecological Program server in Sacramento. Once per week, a backup is made of all databases on a removable media. The backup is stored at a site remote from the CDFG Chico office. Original data sheets are kept at the CDFG's Chico office and photocopies are kept in a remote location away from that office. All data are summarized in annual CDFG administrative reports (Hill and Webber, 1999; Ward and McReynolds, 2004; Ward et al., 2004a, 2004b, 2004c, 2004d).

8. Public Involvement and Outreach –

Public involvement and outreach has been, and will be achieved through local stakeholder meetings and educational workshops. Presentations are regularly made at the Butte Creek Watershed Conservancy and other local public meetings. Educational workshops are conducted at California State University, Chico and by PG&E as part of the current Federal Energy Regulatory Commission (FERC) re-licensing process for the DeSabra Centerville Project. Information is also distributed at local salmon festivals, including the annual Butte Creek and Feather River Hatchery salmon festivals.

9. Work Schedule

The purposed work schedule by task and key milestones is presented in Table 1. Task 1 has been broken into four sub-tasks. Sub-task 1b and 1c are inseparable. Both sub-tasks provide a measurable component of a single returning adult population and need to be completed in order to provide a more precise population estimate. All other tasks and sub-tasks are separable, although Task 3 in conjunction with Task 1b and 1c, provides the critical component necessary for evaluation of catch to escapement, straying, and age. Funding is proposed for the full 36 months. Additional funds will be requested in a subsequent PSP to complete the final three years of adult escapement estimates (Tasks 1a,b,c,d) and recovery of CWT's released under Task 3 of this proposal.

Table 1. – Activity description, starting and ending date of SRCS monitoring on Butte Creek.

Task #	Task	Start	End	Frequency	Deliverable
1-a	Adult SRCS Snorkel Escapement Survey	July	July	Annually 06-08	Quarterly Report Annual Report Final Report
1-b	Adult SRCS Pre-spawn Mortality Survey	June	Sept.	Annually 06-07 (PG&E funded) 08 CALFED	Quarterly Report Annual Report Final Report
1-c	Adult SRCS Spawn Escapement Survey	Sept.	Oct.	Annually 06-08	Quarterly Report Annual Report Final Report
1-d	Adult FRCS Spawn Escapement Survey	Oct.	Dec.	Annually 06-08	Quarterly Report Annual Report Final Report
2	Juvenile Monitoring	Sept.	June	Annually 06-07	Quarterly Report Annual Report Final Report
3	Coded-wire Tagging	Jan.	Apr.	Annually 06-07	Quarterly Report Annual Report Final Report

B. Applicability to CALFED Bay-Delta Program ERP Goals, the ERP Draft Stage 1 Implementation Plan, and CVPIA Priorities.

1. ERP and CVPIA Priorities --

This research project and proposal directly addresses ERP Draft Stage 1 Implementation Plan and Ecosystem Restoration Plan, Goal 1, Recovery of At-risk Species. Additionally, specific applications of the CALFED Science Program Goals included in the Draft Stage 1 Implementation Plan are addressed to include: adaptive management, monitoring, interdisciplinary knowledge of critical unknowns, improving scientific basis of water management, and broad communication of scientific knowledge and scientific activities. SRCS are among species designated “R” in the Multi-Species Conservation Strategy (MSCS) that establishes a goal to recover that species within the CALFED ERP ecological management zones. This project provides baseline population metrics addressing MSCS conservation measures for SRCS relative to abundance, productivity, spatial distribution and diversity, as well as implementing the CVPIA AFRP Evaluation #14 for Butte Creek to evaluate juvenile life history of Butte Creek SRCS. The Butte Creek research project is the only project within the Central Valley that is developing large-scale life history metrics derived directly from evaluation of wild SRCS. Restoration actions and Research Project results to date are cited in the ERP Draft Stage 1 Implementation Plan as an example of one of three watersheds where significant progress is being made.

The fundamental metric used to assess restoration/recovery of SRCS will be the annual adult escapement estimate which is the specific focus of this research project (Figure 1, Conceptual Model).

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

SRCS life history is complex and geographically dispersed. This research project, while located within the Butte Creek watershed and specifically targeting Butte Creek SRCS, is also providing baseline data for recovery/restoration and management of existing and other potential Central Valley SRCS populations. The current research project is providing key input as stated (section A-3 of this proposal) to several recovery and management efforts including: 1) NOAA Fisheries led Central Valley Technical Recovery Team effort developing status and recovery plans for Central Valley SRCS, 2) Interagency Ecological Program Delta Operations Group Sacramento River Spring-run Chinook Salmon Protection Plan, and 3) NOAA Fisheries led workgroup developing management goals and recommendations to the Pacific Fishery Management Council for potential amendments to the Pacific Coast Salmon Plan.

C. Qualifications --

CDFG, Sacramento Valley Central Sierra Region Chico office, will implement and oversee this project. CDFG Regional Manager and Senior Fisheries Staff will provide guidance and support to insure that the project is completed in a timely and professional manner.

Project Management and Oversight

Mr. Paul Ward, CDFG Associate Fishery Biologist and Principal Investigator will provide overall project management and oversight. Mr. Ward has been involved in anadromous fishery management, research, and restoration in the Upper Sacramento River and adjacent watersheds for over 25 years. Mr. Ward's position is funded by the Federal Sportfish Restoration Act (SFRA) and CDFG. His position is not supported by CALFED funds. Ms. Tracy McReynolds, CDFG Associate Fishery Biologist and Project Field Lead, will conduct and oversee all field work and data management. Ms. McReynolds has led anadromous fisheries research and monitoring activities for nine years with CDFG, including the current Butte Creek SRCS investigation. Ms. McReynolds is funded by CDFG. Her position is not supported by CALFED funds. Mr. Ward and Ms. McReynolds have co-authored five previous project reports since 1998 (Ward and McReynolds, 2004; Ward et al., 2004a, 2004b, 2004c, 2004d). Additionally, Mr. Clint Garman CDFG Fishery Biologist will participate in all field activities, and is funded by CDFG. Other CDFG staff will participate as needed. One additional biologist and several field technicians will be hired and funded by CALFED as shown in attached budget. Education and/or experience in a related field are requirements for these positions. Task 3, coded-wire tagging will be completed by a qualified subcontractor under the direction of CDFG, with the contractor selected through competitive bid. Contractor will demonstrate relevant experience, and an ability to mark salmon fry (35-70mm FL) with a tag retention rate of no less than 95% up to 400,000 fish. Additionally contractor will have the demonstrated ability and experience to set-up and calibrate all tagging equipment.

D. Cost –

1. Budget - Attached

2. Cost Sharing –

Cost share, although not tracked by this project, will include CDFG personnel providing project management and oversight, and associated support facilities and equipment. Mr. Paul Ward is dedicated for project management, Ms. Tracy McReynolds for field lead, and Mr. Clint Garman for project field activities.

3. Long-term Funding Strategy –

Overall research objectives of the Butte Creek project will be completed in 2011. It is anticipated that future CALFED funding will be sought for the remaining three years 2009-2011 to complete the adult escapement surveys.

E. Compliance with Standard Terms and Conditions –

Applicants agree to comply with the terms of standard ERP grant agreements, as describe in current PSP attachment with one exception. In Exhibit A, Scope of Work, III Project Officials, it states that the Project Director shall have full authority to act on behalf of the Grantee. Note that Project Directors at CSU, Chico do not have the authority to bind CSU, Chico Research Foundation (the applicant/grantee), contractually only the Vice Provost for Research has that authority.

F. Literature Cited –

Hill, K.A., and J. D. Webber. 1999. Butte Creek Spring-Run Chinook Salmon, *Oncorhynchus tshawytscha*, Juvenile Outmigration and Life History, 1995-1998. Calif. Dept. of Fish and Game, Inland Fisheries Admin. Report No. 99-5, 1999. 46 pp.

Schaefer, M.B. 1951. Estimation of the size of animal populations by marking experiments. U.S. Fish and Wildlife Service Bulletin, 52:189-203.

Ward, P.D. and T. R. McReynolds. 2004. Butte Creek and Big Chico Creeks Spring-Run Chinook Salmon, *Oncorhynchus tshawytscha*, Life History Investigation, 1998-2000. Calif. Dept. of Fish and Game, Inland Fisheries Admin. Report No. 2004-2, 2004. 61 pp.

Ward, P.D., T. R. McReynolds and C. E. Garman. 2004. Butte Creek and Big Chico Creeks Spring-Run Chinook Salmon, *Oncorhynchus tshawytscha*, Life History Investigation, 2000-2001. Calif. Dept. of Fish and Game, Inland Fisheries Admin. Report No. 2004-3, 2004. 47 pp.

Ward, P.D., T. R. McReynolds and C. E. Garman. 2004a. Butte Creek and Big Chico Creeks Spring-Run Chinook Salmon, *Oncorhynchus tshawytscha*, Life History Investigation,

2001-2002. Calif. Dept. of Fish and Game, Inland Fisheries Admin. Report No. 2004-4, 2004. 53 pp.

Ward, P.D., T. R. McReynolds and C. E. Garman. 2004b. Butte Creek Spring-Run Chinook Salmon, *Oncorhynchus tshawytscha*, Pre-spawn Mortality Evaluation 2003. Calif. Dept. of Fish and Game, Inland Fisheries Admin. Report No. 2004-5. 91 pp

Ward, P.D., T. R. McReynolds and C. E. Garman. 2004d. Butte Creek Spring-Run Chinook Salmon, *Oncorhynchus tshawytscha*, Life History Investigation, 2002-2003. Calif. Dept. of Fish and Game, Inland Fisheries Admin. Report No. 2004-6. 43 pp.

G. Nonprofit Verification --

The applicant for this proposal is the CSU, Chico Research Foundation, which along with California State University, Chico is a nonprofit educational entity exempt under Section 501(c)(3) of the Internal Revenue Service code. The Research Foundation's IRS Employer Identification Number is 68-0386518, and State Tax Identification Number is 178-4872 (Attached IRS letter).

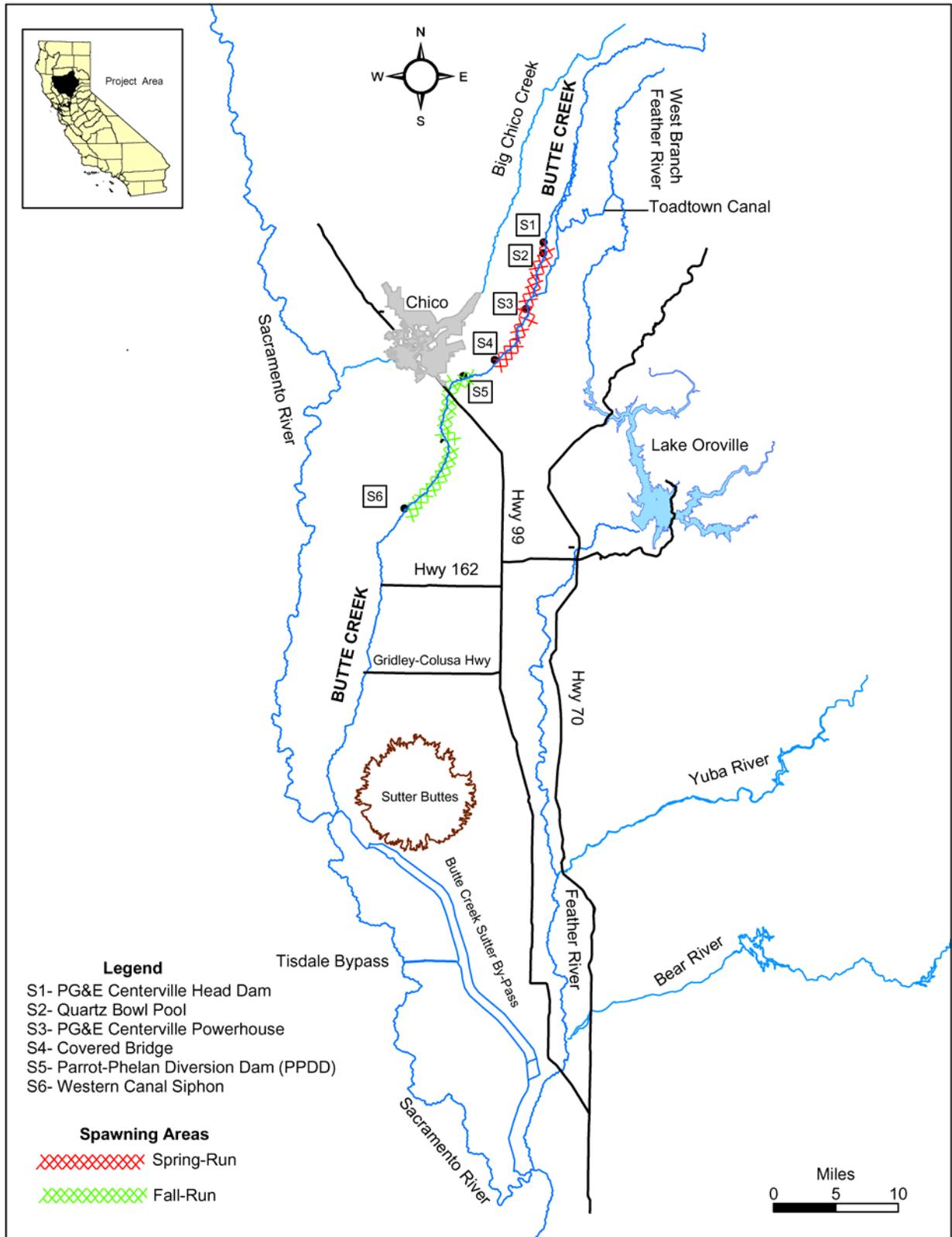


Figure 2 - Map of Butte Creek Watershed showing proposal project area.

Appendix A, Table 1 – Major Fishery Restoration Actions in Butte Creek for period 1993-2003

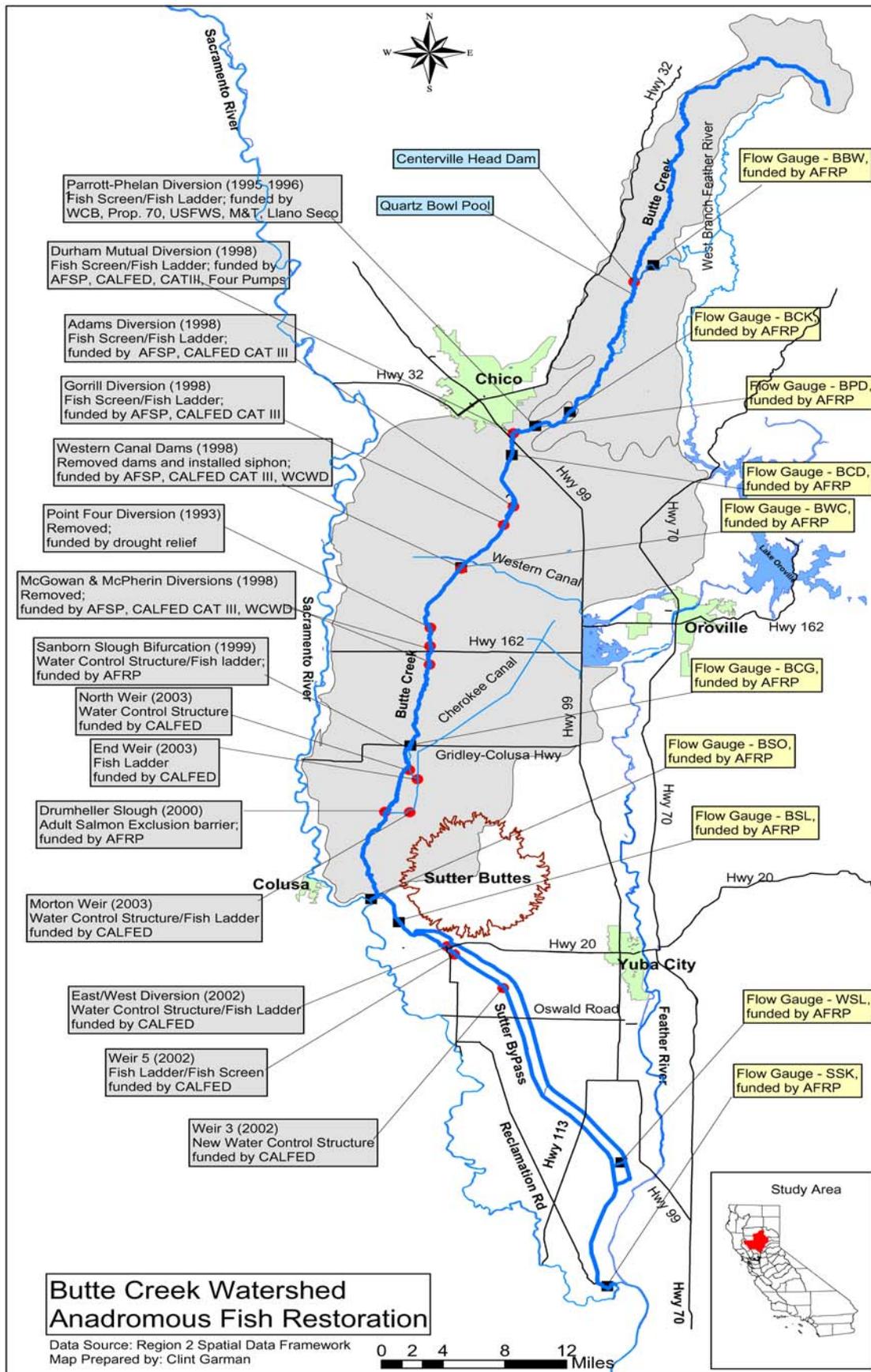
Year	Restoration Action	Partners*	Funding	
			Source	Approximate Cost
1993	Point-four Dam removed and users provided with alternate supply of water conveyed through upgraded WCWD delivery canals, eliminating need for replacement of ineffective fish ladder and construction of fish screen.	FSR, WCWD, CDFG, CDWR.	WCWD	\$235,000
			Prop. 70	\$130,000
			Total	\$360,000
1994	Fishing regulations changed to prevent take of salmon and steelhead	CDFG	-	-
1995	Parrott-Phelan diversion fish screen installed with capacity of 150 cfs, meeting state and federal fish screen requirements.	CDFG, USFWS, M&T, PIC.	Prop. 70	\$65,000
			M&T/PIC	\$65,000
			Total	\$130,000
1995-ongoing	Butte Creek spring-run Chinook life history study initiated to guide implementation and ongoing management of restoration actions.	AFRP, CDFG, PG&E, CSUC, NFWF, CALFED.	AFRP, CALFED	\$898,000
			CDFG	\$1,700,000
			PG&E	\$24,000
			Total	\$2,622,000
1996-ongoing	Ten gaging stations installed or modified and operated by DWR to provide real-time flow and temperature monitoring capability through California Data Exchange Center (CDEC).	USFWS AFRP, CDFG, DWR.	AFRP	\$489,000
			Total	\$489,000
1996	Parrott-Phelan diversion fish ladder installed with a capacity of 300 cfs.	CDFG, DWR, WCB, AFRP	WCB	\$318,000
			AFRP	\$140,000
			Four Pumps	\$299,000
			Total	\$757,000
1996	Fish Habitat team formed to monitor and manage restoration actions including instream flows.	CDFG.	CDFG	\$750,000
			Total	\$750,000
1996	Instream flows of 40 cfs acquired October through June in Butte Creek from Parrott-Phelan diversion to confluence with Sacramento River, for spring-run Chinook and steelhead migration and rearing. Water exchange agreement was part of Big Chico Creek M&T pumps relocation project funded by CVPIA \$2,200,000, Bay-Delta Accord Category III (Metropolitan Water District) \$1,550,000, WCB \$500,000; Ducks Unlimited \$150,000, USFWS \$150,000.	M&T, PIC, USFWS, CDFG, USBR, MET, WCB, DU.	-	-

Year	Restoration Action	Partners*	Funding	
			Source	Approximate Cost
1997	Acquired Keeney property consisting of 56 acres of stream front land to protect riparian habitat adjacent to Butte Creek to benefit anadromous fisheries and associated aquatic environments .	KR, CNLM, BCFG, USFWS.	AFRP	\$735,000
			Total	\$735,000
1997-98	Completed Western Canal siphon and dam(s) removal project. Project implemented as alternative to building fish ladders and fish screens at two WCWD dams, McGowan Dam, McPherrin Dam, and providing fish screens at twelve associated diversions. Alternate sources and/or water conveyance systems were built, allowing removal of the four structures. Project involved installation of an 850 foot siphon under Butte Creek, 2,500 feet of pipelines, 4 pumping stations, 7 check structures, 24,000 feet of new/improved canals, and removal of 4 dams.	WCWD, GR, MR, MPR, USBR, CDFG, USFWS, CDWR, MET.	Tracy Mit.	\$150,000
			WCWD	\$3,283,000
			CALFED	\$3,133,000
			Cat. III, MET	\$3,133,000
			Total	\$9,699,000
1998	Acquired McAmis property consisting of 93 acres of stream front land above and contiguous with 285 acre CDFG Ecological Reserve to protect spring-run Chinook and steelhead habitat.	CDFG, USFWS, WCB, NFWF, CSUC.	AFRP	\$125,000
			NFWF	\$132,000
			WCB	\$425,000
			CALFED	\$186,000
			Total	868,000
1998	Installed Durham Mutual Diversion fish ladder with a maximum flow capacity of 80 cfs, and fish screen with a maximum diversion capacity of 56 cfs.	DMWC, CDWR, CDFG, USFWS, TNC, DU.	Tracy Mit.	\$66,000
			Cat. III, MET	\$316,000
			CVPIA	\$465,000
			Four Pumps	\$88,000
			Total	\$935,000
1998	Water acquisition at Durham Mutual Diversion to provide up to 5 cfs dedicated flows for instream use through Butte Creek to confluence with Sacramento River to benefit spring-run Chinook and steelhead migration and rearing.	RRI, DMWC, USBR, CDFG.	RRI	-
			Total	-
1998	Installed Adams Diversion fish screen with a maximum diversion capacity of 135 cfs and fish ladders with a maximum flow capacity of 80 cfs under dam-in condition, and modified vertical-slot/roughened chute under dam-out condition.	REP, CDWR, CDFG, DU, MET, USBR, USFWS.	Tracy Mit.	\$66,000
			CALFED	\$521,000
			Cat. III, MET	\$521,000
			Total	\$1,108,000

Year	Restoration Action	Partners*	Funding	
			Source	Approximate Cost
1998	Installed Gorrill Diversion fish screen with a maximum diversion capacity of 121 cfs and fish ladders with a maximum flow capacity of 80 cfs under dam-in condition, and vertical-slot under dam-out condition.	GR, CDFG, CDWR, DU, WCWD, MET, USBR.	Tracy Mit.	\$66,000
			CALFED	\$756,000
			Cat. III, MET	\$756,000
			Total	\$1,578,000
1999-01	Replaced Sanborn Slough earthen weir and culvert structure with engineered water control structure and fish ladder.	CWA, DU, CDWR, USFWS, AFRP, CDFG, RD 1004, FT.	AFRP	\$67,000
			USFWS	\$1,000,000
			CALFED	\$950,000
			Total	\$2,017,000
1999	Installed Drumheller Slough adult exclusion barrier to prevent spring-run Chinook salmon from straying out of Butte Creek into RD 1004 diversions.	CDFG, USBR, CDWR, RD 1004, CWA, DU, USFWS.	Tracy Mit.	\$30,000
			AFRP	\$77,000
			Total	\$107,000
2000	Completed Butte Creek Conservancy Watershed Existing Conditions Report and Management Strategy. Project initiated to build cooperative partnerships to compile and develop information related to the management of watershed resources, provide a forum for the continuation of existing efforts to improve anadromous fish populations, and to develop and implement a program to restore and maintain all aspects of watershed health and function.	BCWC, CSUC, USFWS, CDFG, Cat. III.	AFRP	\$452,000
			CAT III	\$83,000
			NFWF	\$83,000
			Total	\$618,000
2002	Installed upgraded water control structure and fish ladder at Sutter Bypass East West diversion, fish ladder and fish screen at Sutter Bypass Weir #5, and upgraded water control structure at Sutter Bypass Weir #3.	BSID, USFWS, CDWR, CDFG, DU.	CALFED	\$4,783,000
			Total	\$4,783,000
2003	Installed upgraded water control structure at Butte Sink North Weir, water control structure and fish ladder at Butte Sink End Weir, and water control structure and fish ladder at Butte Sink Morton Weir complex.	WMDC, FTDC, CDFG, USFWS, NMFS, DU, CWA.	CALFED	\$5,748,000
			Total	\$5,748,000
Total All Projects				\$33,309,000

*** Partial List of Partners:**

1. Anadromous Fish Restoration Program (AFRP)
2. Bay Delta Accord Category III (Cat. III)
3. Butte County Fish and Game Commission (BCFGC)
4. Butte Creek Watershed Conservancy (BCWC)
5. Butte Slough Irrigation District (BSID)
6. California Bay Delta Program (CALFED)
7. California Department of Fish and Game (CDFG)
8. California Department of Water Resources (CDWR)
9. Center for Natural Lands Management (CNLM)
10. California State University, Chico (CSUC)
11. California Waterfowl Association (CWA)
12. Ducks Unlimited (DU)
13. Durham Mutual Water Company (DMWC)
14. Field and Tule Duck Club (FTDC)
15. Five Star Ranches (FSR)
16. Foraker Trust (FT)
17. Four Pumps Fund CDWR (Four Pumps)
18. Gorrill Ranch (GR)
19. Keeney Ranch (KR)
20. McGowan Ranch (MR)
21. McPherrin Ranch (MPR)
22. Metropolitan Water District of Southern Calif. (MET)
23. M&T Chico Ranch (M&T)
24. National Fish and Wildlife Foundation (NFWF)
25. National Marine Fisheries Service (NMFS)
26. Pacific Gas and Electric (PG&E)
27. Parrott Investment Co. (PIC)
28. Rancho Esquon Partners (REP)
29. Reclamation District 1004 (RD 1004)
30. Resources Renewal Institute (RRI)
31. The Nature Conservancy (TNC)
32. United States Bureau of Reclamation (USBR)
33. United States Fish and Wildlife Service (USFWS)
34. Western Canal Water District (WCWD)
35. White Mallard Duck Club (WMDC)
36. Wildlife Conservation Board (WCB)



Appendix A, Figure 1 - Map of Butte Creek showing restoration projects/actions 1993-2003.

INTERNAL REVENUE SERV.
DISTRICT DIRECTOR
P. O. BOX 2508
CINCINNATI, OH 45201

DEPARTMENT OF THE TREASURY

Date: **AUG 5 1997**

Employer Identification Number:
68-0386518

DLN:
17053105054007

THE CSU CHICO RESEARCH FOUNDATION
C/O RICHARD JACKSON
FIRST & NORMAL STS
CHICO, CA 95929-0246

Contact Person:
D. A. DOWNING
Contact Telephone Number:
(513) 241-5199

Accounting Period Ending:
June 30

Form 990 Required:
Yes

Addendum Applies:
Yes

Dear Applicant:

Based on information supplied, and assuming your operations will be as stated in your application for recognition of exemption, we have determined you are exempt from federal income tax under section 501(a) of the Internal Revenue Code as an organization described in section 501(c)(3).

We have further determined that you are not a private foundation within the meaning of section 509(a) of the Code, because you are an organization described in section 509(a)(3).

If your sources of support, or your purposes, character, or method of operation change, please let us know so we can consider the effect of the change on your exempt status and foundation status. In the case of an amendment to your organizational document or bylaws, please send us a copy of the amended document or bylaws. Also, you should inform us of all changes in your name or address.

As of January 1, 1984, you are liable for taxes under the Federal Insurance Contributions Act (social security taxes) on remuneration of \$100 or more you pay to each of your employees during a calendar year. You are not liable for the tax imposed under the Federal Unemployment Tax Act (FUTA).

Since you are not a private foundation, you are not subject to the excise taxes under Chapter 42 of the Code. However, you are not automatically exempt from other federal excise taxes. If you have any questions about excise, employment, or other federal taxes, please let us know.

Grantors and contributors may rely on this determination unless the Internal Revenue Service publishes notice to the contrary. However, if you lose your section 509(a)(1) status, a grantor or contributor may not rely on this determination if he or she was in part responsible for, or was aware of, the act or failure to act, or the substantial or material change on the part of the organization that resulted in your loss of such status, or if he or she acquired knowledge that the Internal Revenue Service had given notice that you would no longer be classified as a section 509(a)(1) organization.

Donors may deduct contributions to you as provided in section 170 of the

Letter 947 (DO/CG)

THE CSU CHICO RESEARCH FOUNDATION

Code. Bequests, legacies, devises, transfers, or gifts to you or for your use are deductible for federal estate and gift tax purposes if they meet the applicable provisions of Code sections 2055, 2106, and 2522.

Contribution deductions are allowable to donors only to the extent that their contributions are gifts, with no consideration received. Ticket purchases and similar payments in conjunction with fundraising events may not necessarily qualify as deductible contributions, depending on the circumstances. See Revenue Ruling 67-246, published in Cumulative Bulletin 1967-2, on page 104, which sets forth guidelines regarding the deductibility, as charitable contributions, of payments made by taxpayers for admission to or other participation in fundraising activities for charity.

In the heading of this letter we have indicated whether you must file Form 990, Return of Organization Exempt From Income Tax. If Yes is indicated, you are required to file Form 990 only if your gross receipts each year are normally more than \$25,000. However, if you receive a Form 990 package in the mail, please file the return even if you do not exceed the gross receipts test. If you are not required to file, simply attach the label provided, check the box in the heading to indicate that your annual gross receipts are normally \$25,000 or less, and sign the return.

If a return is required, it must be filed by the 15th day of the fifth month after the end of your annual accounting period. A penalty of \$10 a day is charged when a return is filed late, unless there is reasonable cause for the delay. However, the maximum penalty charged cannot exceed \$5,000 or 5 percent of your gross receipts for the year, whichever is less. This penalty may also be charged if a return is not complete, so please be sure your return is complete before you file it.

You are not required to file federal income tax returns unless you are subject to the tax on unrelated business income under section 511 of the Code. If you are subject to this tax, you must file an income tax return on Form 990-T, Exempt Organization Business Income Tax Return. In this letter we are not determining whether any of your present or proposed activities are unrelated trade or business as defined in section 513 of the Code.

You need an employer identification number even if you have no employees. If an employer identification number was not entered on your application, a number will be assigned to you and you will be advised of it. Please use that number on all returns you file and in all correspondence with the Internal Revenue Service.

This determination is based on evidence that your funds are dedicated to the purposes listed in section 501(c)(3) of the Code. To assure your continued exemption, you should keep records to show that funds are expended only for those purposes. If you distribute funds to other organizations, your records should show whether they are exempt under section 501(c)(3). In cases where the recipient organization is not exempt under section 501(c)(3), there should be evidence that the funds will remain dedicated to the required

THE CSU CHICO RESEARCH FOUNDATION

purposes and that they will be used for those purposes by the recipient.

Since you have not indicated that you intend to finance your activities with the proceeds of tax exempt bond financing, in this letter, we have not determined the effect of such financing on your tax exempt status.

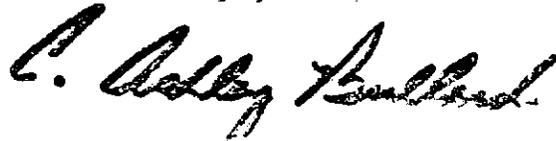
If we have indicated in the heading of this letter that an addendum applies, the enclosed addendum is an integral part of this letter.

Because this letter could help resolve any questions about your exempt status and foundation status, you should keep it in your permanent records.

We have sent a copy of this letter to your representative as indicated in your power of attorney.

If you have any questions, please contact the person whose name and telephone number are shown in the heading of this letter.

Sincerely yours,

A handwritten signature in black ink, appearing to read "C. Ashley Paulson". The signature is written in a cursive style with a large initial "C".

District Director

THE CSU CHICO RESEARCH FOUNDATION

Letter has been revised to reflect the correct Employee Identification Number. We have updated our records by deleting Employee Identification Number 63-0386518.

Tasks And Deliverables

Butte Creek spring–run chinook salmon life history investigation

Task ID	Task Name	Start Month	End Month	Deliverables
1	Project Management	1	36	Semiannual and final reports. Periodic invoices
1a	Adult SRCS Snorkel Escapement Survey	1	36	Quarterly, annual and final report.
1b	Adult SRCS Pre-spawn Mortality Survey	1	36	Quarterly, annual and final report
1c	Adult SRCS Spawn Escapement Survey	1	36	Quarterly, annual and final report
1d	Adult FRCS Spawn Escapement Survey	1	36	Quarterly, annual and final report
2	Juvenile Monitoring	1	24	Quarterly, annual and final report
3	Coded-wire Tagging	1	24	Quarterly, annual and final report

Comments

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

Project management is provided by permanent DFG staff and not a CALFED budget item.

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
\$184,872	\$58,565	\$0	\$74,000	\$110,000	\$0	\$0	\$300	\$427,737	\$85,544	\$513,281

Do you have cost share partners already identified?

No.

If yes, list partners and amount contributed by each:

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.

Butte Creek spring-run chinook salmon life history investigation

Butte Creek spring-run chinook salmon life history investigation

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
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1: project management (12 months)	0	0	0	0	0	0	0	0	0	\$0	0	\$0
1a: Adult SRCS Snorkel Escapement Survey (12 months)	991	351	0	0	2000	0	0	0	0	\$3,342	668	\$4,010
1b: Adult SRCS Pre-spawn Mortality Survey (12 months)	3848	1659	0	0	0	0	0	0	0	\$5,507	1101	\$6,608
1c: Adult SRCS Spawn Escapement Survey (12 months)	10445	2903	0	0	0	0	0	0	0	\$13,348	2670	\$16,018
1d: Adult FRCS Spawn Escapement Survey (12 months)	9841	2871	0	0	0	0	0	0	0	\$12,712	2542	\$15,254
2: Juvenile Monitoring (12 months)	35781	10526	0	0	0	0	0	0	0	\$46,307	9261	\$55,568
3: Coded-wire Tagging (12 months)	13784	5573	0	37000	52000	0	0	0	300	\$108,657	21731	\$130,388
Totals	\$74,690	\$23,883	\$0	\$37,000	\$54,000	\$0	\$0	\$0	\$300	\$189,873	\$37,973	\$227,846

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: project management (12 months)	0	0	0	0	0	0	0	0	\$0	0	\$0
1a: Adult SRCS Snorkel Escapement Survey (12 months)	991	359	0	0	2000	0	0	0	\$3,350	670	\$4,020
1b: Adult SRCS Pre-spawn Mortality Survey (12 months)	3848	1709	0	0	0	0	0	0	\$5,557	1111	\$6,668
1c: Adult SRCS Spawn Escapement Survey (12 months)	10445	2930	0	0	0	0	0	0	\$13,375	2675	\$16,050
1d: Adult FRCS Spawn Escapement Survey (12 months)	9841	2908	0	0	0	0	0	0	\$12,749	2549	\$15,298
2: Juvenile Monitoring	35781	10658	0	0	0	0	0	0	\$46,439	9288	\$55,727

(12 months)												
3: Coded-wire Tagging (12 months)	13784	5726	0	37000	52000	0	0	0	\$108,510	21702	\$130,212	
Totals	\$74,690	\$24,290	\$0	\$37,000	\$54,000	\$0	\$0	\$0	\$189,980	\$37,995	\$227,975	

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: project management (12 months)	0	0	0	0	0	0	0	0	\$0	0	\$0
1a: Adult SRCS Snorkel Escapement Survey (12 months)	991	359	0	0	2000	0	0	0	\$3,350	670	\$4,020
1b: Adult SRCS Pre-spawn Mortality Survey (12 months)	14215	4197	0	0	0	0	0	0	\$18,412	3682	\$22,094
1c: Adult SRCS Spawn Escapement Survey (12 months)	10445	2930	0	0	0	0	0	0	\$13,375	2675	\$16,050
1d: Adult FRCS Spawn Escapement Survey (12 months)	9841	2906	0	0	0	0	0	0	\$12,747	2549	\$15,296

Totals	\$35,492	\$10,392	\$0	\$0	\$2,000	\$0	\$0	\$0	\$47,884	\$9,576	\$57,460
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Budget Justification

Butte Creek spring–run chinook salmon life history investigation

Labor

Year 1 ---- Task 1a - Adult Escapement SRCS Snorkel Survey: Biologist 32 hours @ \$18.50/hr, Field Tech 32 hours @ \$12.46/hr; Task 1b - Adult Escapement SRCS Pre-spawn Survey: Biologist 208 hours @ \$18.50/hr; Task 1c - Adult Escapement SRCS Spawn Survey: Biologist 112 hours @ \$18.50/hr, Field Tech 672 hours @ \$12.46/hr; Task 1d - Adult Escapement FRCS Spawn Survey: Biologist 144 hours @ \$18.50/hr, Field Tech 576 hours @ \$12.46/hr; Task 2 - Juvenile Monitoring: Biologist 548 hours @ \$18.50/hr, Field Tech. 2058 hours @ \$12.46/hr; Task 3 - Coded-wire Tagging: Biologist 640 hours @ \$18.50/hr, Field Tech 156 hours @ \$12.46/hr. Year 2 ---- Task 1a - Adult Escapement SRCS Snorkel Survey: Biologist 32 hours @ \$18.50/hr, Field Tech 32 hours @ \$12.46/hr; Task 1b - Adult Escapement SRCS Pre-spawn Survey: Biologist 208 hours @ \$18.50/hr; Task 1c - Adult Escapement SRCS Spawn Survey: Biologist 112 hours @ \$18.50/hr, Field Tech 672 hours @ \$12.46/hr; Task 1d - Adult Escapement FRCS Spawn Survey: Biologist 144 hours @ \$18.50/hr, Field Tech 576 hours @ \$12.46/hr; Task 2 - Juvenile Monitoring: Biologist 548 hours @ \$18.50/hr, Field Tech. 2058 hours @ \$12.46/hr; Task 3 - Coded-wire Tagging: Biologist 640 hours @ \$18.50/hr, Field Tech 156 hours @ \$12.46/hr. Year 3 ----Task 1a - Adult Escapement SRCS Snorkel Survey: Biologist 32 hours @ \$18.50/hr, Field Tech 32 hours @ \$12.46/hr; Task 1b - Adult Escapement SRCS Pre-spawn Survey: Biologist 208 hours @ \$18.50/hr, Field Tech 832 hours @ \$12.46/hr; Task 1c - Adult Escapement SRCS Spawn Survey: Biologist 112 hours @ \$18.50/hr, Field Tech 672 hours @ \$12.46/hr; Task 1d - Adult Escapement FRCS Spawn Survey: Biologist 144 hours @ \$18.50/hr, Field Tech 576 hours @ \$12.46/hr

Benefits

Biologist - Year 1 - 25% of salary plus \$560/month, Year 2 - 25% of salary plus \$600/month, Year 3 - 25% of salary plus \$600/month (Month = 167 hours); Field Tech - 24% of salary.

Travel

There will be no travel with this proposal

Supplies And Expendables

Year 1 ---- Task 3 Coded Wire Tagging - Coded Wire Tags \$32,000 (400,000 @ \$80/1000 tags, Tagging supplies \$5,000 (head molds, cutters, needles); Year 2 ---- Task 3 Coded Wire Tagging - Coded Wire Tags \$32,000 (400,000 @ \$80/1000 tags, Tagging supplies \$5,000 (head molds, cutters, needles)

Services And Consultants

Task 1: 1a- Adult SRCS Snorkel Escapement Survey - \$2000 annually (Year 1-3) will be required for swiftwater safety training for all employees Task 3 Coded-Wire Tagging will be completed by a a qualified subcontractor selected by competitive bid under supervision of California Department of Fish and Game project personnel.

Equipment

There will be no equipment acquired under this proposal

Lands And Rights Of Way

There will be no lands, easements or rights of way needed for this proposal.

Other Direct Costs

Task 3 Coded-wire tagging Year 1 \$300 will be required for hiring cost associated with hiring of the biologist position

Indirect Costs/Overhead

Overhead rate is 20% of total direct costs.

Comments

Environmental Compliance

Butte Creek spring–run chinook salmon life history investigation

CEQA Compliance

Which type of CEQA documentation do you anticipate?

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?

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	-	-	
CESA Compliance: 2081	-	-	
CESA Compliance: 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	x	1407
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.

Land Use

Butte Creek spring–run chinook salmon life history investigation

Does the project involve land acquisition, either in fee or through easements, to secure sites for monitoring?

- 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.
- Yes.

Describe briefly the provisions made to secure this access.

Do the actions in the proposal involve physical changes in the current land use?

- 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?
 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?
 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.