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EXECUTIVE SUMMARY
Butte Creek Implementations
Riparian Education and Geomorphology Analysis

Name of Applicant and Principal Investigators
Research Foundation, California State University, Chico
Donald Holtgrieve, Allen Harthorn, Department of Geography and Planning, CSU Chico
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Project Description and Primary Biological/Ecological Objectives
The Research Foundation of California State University, Chico (CSUC), and the Butte Creek Watershed Conservancy (BCWC) are engaged in a long-range watershed management planning effort (Butte Creek Watershed Project, BCWP) for Butte Creek in cooperation with landowners, water users, agricultural interests, conservation groups and state and federal agencies under the supervision of the Department of Geography and Planning at CSUC. Protection of critical habitat for the endangered spring run Chinook salmon and steelhead trout populations of Butte Creek is a high-priority for all the agencies working on anadromous fisheries.

The riparian corridor of the lower canyon is an area of great concern as it plays crucial roles as habitat for priority species, yet has been greatly influenced by human land use activities over the last 130+ years. Historic hydraulic mining, followed by dredging operations, and finally gravel and sand extraction have pushed the creek into a disequilibrium condition that is affecting primary habitat as well as current residential land uses.

Justification for Project Funding by CALFED
This project meet a number of CALFED objectives including protection of riparian corridors and development of riparian and floodplain management practices that protect, restore and enhance priority habitats for priority species, specifically shaded riverine and aquatic habitats for spring run Chinook salmon and steelhead trout.

Budget Costs and Third Party Impacts

	Total costs
Task 1	\$80,905
Task 2	\$35,704
Task 3	\$35,701

There will be very limited third party impacts from this project. The main concern would be the potential loss of local tax revenue by Butte County. This would amount to approximately \$4000 per year. Other effects that would need mitigation are the impacts of the recreational users. These concerns will be addressed and mitigated as part of the management plan for the Butte Creek Ecological Preserve and in the WMS development.

Applicant Qualifications
The protection and enhancement of local creeks and watersheds by local community groups is a high priority at California State University, Chico. Toward this end, faculty and resources, conservation groups, public agencies, and others as needed are utilized. As a part of its

community service mission, it is the policy of the CSUC Research Foundation to organize teams for special projects and to provide the kinds of services required for this project.

Monitoring and Data Evaluation

The monitoring and evaluation of the project will be conducted by the BCWP staff, Butte Creek Education Project and the Recreation Department at CSUC. Development of the management plan, integration with education programs and initiation of restoration projects will be closely monitored to ensure timely completion of activities and maximum outreach to target audiences; ie., students and recreational users.

Local Support/Coordination with other Programs/Compatibility with CALFED Objectives
NFWF, CDFG, USFWS the BCWC, recognizing the value and compatibility of this project with CALFED and other anadromous fish objectives have agreed to contribute and support the RPRP.

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Type of organization and tax status
Auxiliary organization of CSU, Chico as provided for in the Calif. Education Code, Title 5.
Tax status: Non-profit educational 501(c)3

Tax identification number
68-0386518

Technical and Financial Contact person
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Participants/Collaborators in Implementation
NFWF, USFWS, CDF&G, Butte Creek Education Project, Butte Creek Watershed Conservancy

RFP project group type
Other services(education)

Project Description and Approach

Butte Creek has been the focus of much attention lately for a number of reasons. The most significant is the listing of the spring run Chinook salmon as an endangered species by the California Fish and Game Commission. The looming National Marine Fisheries Service steelhead listing, the floods, emergency flood repairs to diversion structures and creek banks, and local land use planning issues, have all contributed to a tremendous amount of interest and publicity. The Butte Creek Watershed Conservancy (BCWC) and the Research Foundation at California State University, Chico (CSUC), propose to conduct a research study of the fluvial geomorphology of lower Butte Creek (Task 1) and to develop a Riparian Ecosystem Management Education Program (Task 2 & 3) through the Department of Geography and Planning, that will address many of these issues in addition to restoring and protecting valuable riparian refugia. The project will be conducted in conjunction with the existing K-12 education program and the development of a Watershed Management Strategy (WMS) funded by CALFED, USFWS and EPA to contribute specific information useful to students and provide easily understandable and basic information to private landowners and local officials. The project will focus on the more urbanized regions of the watershed which are the prime migrational corridor, holding, spawning and rearing habitat for salmon and steelhead.

The riparian corridor in the area of greatest concern is also one of the areas of highest population density. This area was one of the most northerly sections of California that was mined for gold extensively in the 1800's. Several hydraulic mining operations channeled creek flows through many miles of flumes to create the hydraulic head necessary to blast away the hillsides. The tailings cover hundreds of acres and erode into the creek in dozens of locations. In the lower sections of the canyon, near the valley floor, dredgers cruised the riparian areas, sifting through the deposits of thousands of years of creek sediments for their precious bounty. The creek is still in the recovery stages from the effects of hydraulic and dredger mining. The remains of these areas have been, more recently, extensively mined for sand and gravel and most recently, leveled and developed for rural home sites. Land use zoning was established in cooperation with landowners in the '70's and has been effective in limiting development to the carrying capacity of the area. In recent years, proposals to develop some smaller parcels in the lower canyon have stirred a lot of controversy. BCWC and CSUC are working on projects to purchase some of the critical parcels and establish conservation easements on others. These measures should be effective in protecting the remaining open riparian areas connected to the Fish and Game Preserve. Concerns have been expressed with a County planning proposal to protect other riparian areas in Butte county. The proposal has met with opposition in part because of the "command and control" method of providing this protection. This project would approach the problem as an educational project that would include information on protection and conservation incentives for landowners which is a much more palatable approach.

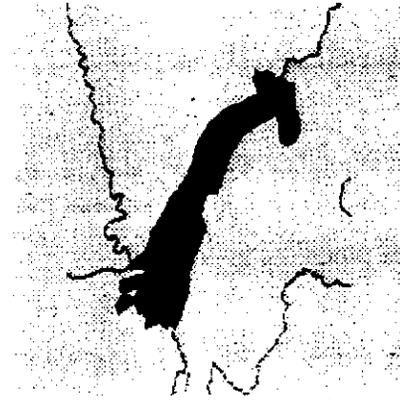
This project will look specifically at the fluvial geomorphological dynamics of the reach from State highway 99 to the Centerville head dam (Task 1) and the riparian corridor in the urbanized reaches. It will create a template for appropriate restoration sites and establish a clear definition of the private property areas that need further protection so as to target the education program.

The education project will focus on developing educational materials (Task 2) on riparian ecosystem management. This material will be made available through a series of workshops and seminars (Task 3) targeting teachers and private landowners living in the riparian corridor. This proposal is to also address some immediate restoration needs in this area.

The project will produce, using base maps developed through the USFWS and BOR/NFWF/CALFED projects at CSU, Chico, a detailed **GIS analysis of the critical holding, spawning and rearing sites** as well as the **migrational corridors** that support Spring Run Chinook Salmon and Steelhead Trout. The **fluvial geomorphological conditions report and land use analysis** will be used to create a **restoration planning guide** to address these areas. Materials on managing riparian vegetation will be produced for schools and private landowners.

Location and or geographic boundaries of project

The project will focus on the lower reaches of the Butte Creek Canyon at the lower end of the spring run Chinook salmon and steelhead habitat and the upper end of fall run Chinook salmon habitat. The area extends from Highway 99 and Butte Creek to the upper limits of anadromous fish at the Centerville Head Dam. The primary focus area will extend up to the Helltown Bridge, which is the upper limit of residential development.



Expected benefits

This project will produce land use planning information that clearly delineates areas that need protection and encourages restoration and enhancement of the riparian corridor in the holding and spawning range of anadromous fish. The deliverables would include a **GIS analysis, fluvial geomorphological conditions report, current land use analysis and a guide to restoration for the critical areas**. This would allow for the reestablishment of suitable Shaded Riverine and Instream Aquatic habitats and protection thereof in perpetuity. The project will develop an educational program on Riparian Ecosystem Management for Butte Creek:

- Create a nexus between K-12 education and public education for landowners and agencies
- Improve the management of the riparian corridor to enhance benefits of anadromous fish
- Develop coordinated project planning between private and public landowners

The project will also distribute educational pamphlets and flyers on the values of riparian ecosystems:

- Setup educational workshops with private landowners and local resource managers
- Utilize developing watershed education programs in the local school districts
- Reestablish riparian plant communities devastated by the floods
- Distribute information on California Fish and Game Restoration techniques to landowners
- Involve local, state and federal agency personnel to coordinate efforts

The effects of urbanization compounded by the record flood event of January 1997 have left the riparian corridor in marginal condition for cooling and supplying nutrients and food to the stream. The long-term benefit of the project will be to educate, with appropriate scientific information, students and the general public on the value of protecting, restoring and enhancing the shaded riverine and instream aquatic habitats that are so important to the priority species indigenous to Butte Creek. Short-term benefits will be to develop a guide to restoration for Butte Creek that will ensure that efforts are as applied in an appropriate and efficient manner.

Background and biological/technical justification

Management of the riparian corridor to maintain suitable fish passage, holding, spawning and rearing habitat is critical to the survival and recovery of Spring Run Chinook Salmon and Steelhead. The USFWS and the California Department of Fish and Game (CDFG) have identified Butte Creek's need for management of land use, riparian protection and coordinated watershed planning. Butte Creek has been the focus of several large scale fish passage improvement projects but has yet to have any riparian management projects effected. The Butte Creek Watershed Conservancy and the Research Foundation are coordinating a watershed planning effort to identify issues and concerns, develop an existing conditions report, identify and resolve data gaps and prepare a management strategy. As issues of concern are identified, specific implementation measures will be proposed. In conjunction with the management project, an educational effort is being coordinated with the project for K-12 classroom teachers. Curricula is being gathered and developed specifically for the Butte Creek watershed. Teachers are training in watershed curricula and bioassessment and will begin utilizing the materials in classroom projects in the Fall of 1997. There are significant concerns over the aftermath of the January floods and the loss of many areas of riparian vegetation(Appendix C). The open creek channel is wide and without shade which will serve to increase water temperature beyond the safe limits for salmonoids. This lower reach of the habitat was extensively used by Spring Run Salmon in the 1995 spawning season which had over 7500 salmon fighting for available spawning gravels.

Restoration projects are being proposed in the lower reaches of the holding, spawning and rearing areas of Spring Run Salmon and Steelhead Trout, that will greatly improve the habitat for these species. Restoration projects need to have the best available information on the fluvial geomorphological dynamics of these areas to be effective. To preserve these important habitats, land use planning must address the needs of the priority anadromous fish species and the aquatic and terrestrial biota that utilize these areas. Much of the land in the proposed project area is owned by the California Department of Fish and Game, but due to lack of funding it has no management plan to protect, restore or enhance the land.

Land use planning in the riparian corridor which support Spring Run Chinook Salmon and Steelhead Trout has not effectively protected critical areas and further development would have a negative impact on these areas. County planning efforts currently underway have not addressed the fluvial geomorphology or the habitat requirements of anadromous fish. Restoration projects are proposed to address select areas, however there is little background information on the

potential success of these projects. The flood conditions of January 1997 have clearly demonstrated that restoration without a clear understanding of the dynamics of the creek would likely be a waste of time and money. This project would develop deliverable documents to guide these efforts.

Proposed Scope of Work

Task 1 Research and analyze geomorphology and produce restoration guide

Task 2 Develop materials and curriculum

Task 3 Distribute information and present workshops

The project tasks would be:

Task 1 The project will be coordinated within the Butte Creek Watershed Project (USFWS/BOR/NFWF/CALFED) at California State University, Chico, addressing the specific land and water management practices that affect the critical holding and spawning habitat for Spring Run Chinook Salmon, Steelhead Trout and other associated riparian species. The analysis and planning effort will be coordinated with the Butte County Planning Commission who are currently working on rezoning and stream corridor proposals to reduce potential development and the associated impacts on the riparian corridor. Base maps for the watershed project are being developed and will be utilized for analysis and initiation of the planning effort and detailed mapping of critical areas. The project will be under the direction and supervision of the project directors, Dr. Donald Holtgrieve and Allen Harthorn. Other faculty from California State University, Chico will coordinate with the directors to address the geologic status, riparian corridor conditions, the fluvial geomorphology, and urban and recreational development in the critical areas. The project will be completed by June of 1998 and submitted for implementation to the Butte County Planning Commission and the Board of Supervisors.

Task 2

- Collect and synthesize information on riparian ecosystems
- Establish a riparian educational component for K-12 schools

Task 3

- Provide at least two public workshops on riparian ecosystems
- Distribute information on riparian ecosystems
- Distribute information on landowner incentives

Projects would be conducted over a two year period. The project will be directed by Dr. Donald Holtgrieve and Allen Harthorn with faculty supporting the riparian ecosystem information gathering and development of specific materials for landowners and agencies. Coordination of activities will be handled by the Project Assistant, Laura Lukes. Educational coordination with K-12 teachers will be handled by Roberta Walker-Forest. Graduate students and assistants will do much of the field work. Volunteers from the Butte Creek Watershed Conservancy will assist in all of the efforts. They will provide a minimum of 400 hours at an in-kind rate of \$10.00/hr., distributing materials, assisting in workshop coordination and publicity.

Monitoring and Data evaluation

The fluvial geomorphology study will be overseen by Matt Kondolf, PhD., who has reviewed the situation and deems this area of critical concern. He will monitor and evaluate all information for accuracy and reliability. Teacher surveys will be completed to determine the relevance and value of the riparian education components. Landowner surveys will also be conducted to ensure the target audience is understanding and utilizing the information.

Implementability

Both projects have designated "ready to go" and the development of the existing conditions report for the WMS has indicated the need. These types of research and education are both need to fill data gaps and initiate the process of developing sustainable attitude that will protect, restore and enhance the primary habitats, shaded riverine and instream aquatic.

Costs and Schedule to implement proposed project

Budget Costs

Project Phase and task	Direct labor hours	Direct Salaries and benefits	Overhead labor (general, admin and fee	Service contracts	Materials and acquisition contracts	Miscellaneous and other direct costs	Total costs
Task 1	2,032	42,942	12,463	7,000	10,000	8,500	80905
Task 2	1,200	24,067	7,637			4,000	35704
Task 3	670	13,437	4,264	8,000		10,000	35701

Schedule (Task 1&2): November 1997 Collect existing educational information on riparian management

March 1998	Incorporate riparian ecosystem curricula in K-12 program
May 1998	Conduct first riparian workshop
	Distribute educational pamphlets on riparian ecosystems
	Distribute incentive program information to landowners
September 1998	Conduct workshop on incentive programs
November 1998	Distribute informational materials
	Conduct second riparian workshop
March 1999	Conduct second workshop on incentive programs
September 1999	Evaluate education integration with K-12 program
October 1999	Evaluate overall efforts

Scheduled Milestones

Completion of Fluvial Geomorphology Study	July 1998
Develop educational materials	March 1998
Conduct workshops	Spring 1998-Spring 1999

Third Party Impacts

There will be very limited third party impacts from this project. The main concern would be the potential loss of local tax revenue by Butte County. This would amount to approximately \$4000 per year. Other effects that would need mitigation are the impacts of the recreational users. These concerns will be addressed and mitigated as part of the management plan for the Butte Creek Ecological Preserve and in the WMS development.

Applicant Qualifications

CALIFORNIA STATE UNIVERSITY, CHICO

Statement of Capabilities for Watershed Research and Planning

The protection and enhancement of local creeks and watersheds by local community groups is a high priority at California State University, Chico. Toward this end, faculty and resources, conservation groups, public agencies, and others as needed are utilized. As a part of its community service mission, it is the policy of the University Research Foundation to organize teams for special projects and to provide the kinds of services described below.

Project Administration: The Research Foundation, as part of its regular operation, searches for government and foundation funding opportunities, makes contact with those organizations and provides assistance in grant proposal writing. Foundation personnel then administer the grant funds, provide auditing, and bookkeeping functions, and insure compliance with all government regulations and procedures.

Faculty: The primary mission of our faculty is teaching our own students. However, with funds generated from grants and contracts, our faculty often undertake research, planning, and other community based projects. Faculty who have particular expertise in watershed research and planning are listed on attached pages. Faculty can also be of service by supervising interns and conducting class projects that relate to the mission of the watershed protection groups (see below). Environmental education faculty are also available to assist local school teachers in creating and teaching curricula about our region's diverse natural environments.

Department, Institutes, Centers and Laboratories: Special units of the university are often organized and called upon to address specific community and regional needs. Those related to watershed protection are listed on the attached pages. In addition to the more obvious administrative units, such as the Department of Geography and Planning, there are others that could be called on to fill specific needs, such as the Department of Communication Design and Journalism, which can produce informational material such as newsletters, videos, and press releases. The Geographic Information Center (GIC) has the capability of collecting and compiling public domain maps through the internet as well as producing GIS maps on request.

Internships and Class Projects: Other possible resources are community based internships supervised by several of the departments and faculty listed on the attachments. In the past,

interns have gained personal knowledge and skills while providing community service in environmental monitoring, report writing, field mapping, GIS mapping, interviewing informants, documentary research, classroom teaching assistance, plan design, and questionnaire design and administration. Such win-win arrangements can also be established for small groups of students, and sometimes an entire class may be organized around a particular issue or need.

Project Personnel:

Director: Dr. Donald Holtgrieve, Professor of Geography and Planning, CSUC. He teaches courses in water resources and environmental planning. Dr. Holtgrieve has been the recipient of many grants and awards, with a particular focus on the environment, specifically water quality and watershed management. He has extensive experience in directing grants awarded by both State and Federal Agencies, as well as official certification in Land Use, Transportation, and Wetlands Planning. Dr. Holtgrieve has supervised over 200 projects over the last 25 years. As Project Director, Dr. Holtgrieve will provide assurance that adequate resources are provided to the project, and will be the first line of communication between CAL FED Category III and CSU Chico.

Manager: Allen Harthorn, MS, has many years of experience managing projects for CSU Chico, as well as being an avid fisherman. His personal involvement with and love for the Butte Creek Watershed led him to start the Butte Creek Watershed Conservancy. Mr. Harthorn was personally responsible for obtaining the initial USF&WS grant to develop a Management Strategy for the Butte Creek Watershed. As Project Manager, Mr. Harthorn will continue his public outreach efforts, as well as continuing to develop his extensive and exhaustive list of professional, agency and personal contacts for the Watershed.

Education Coordinator:

Roberta Walker-Forest, M.A., has over ten years experience working in the education community. She has worked for many years in a variety of educational settings ranging from teaching environmental education at outdoor schools to being an environmental interpretive ranger for federal natural resource agencies. Recently, she has been director and assistant director in helping to establish several education enrichment programs in Northern California, including the Butte Creek Watershed Education Progra. Roberta has a vibrant enthusiasm for teaching about the environment as well as a deep devotion to helping young people develop a positive relationship with themselves as well as the world around them.

Office Manager:

Laura Lukes has managed project offices for the Research Foundation since April of 1994. She has excellent organizational, managerial, and fiscal accounting skills, as well as knowledge of and experience with fiscal regulations for state and federal grant accounting. Ms. Lukes is responsible for all internal accounting for grants and contracts, document management, and the overall smooth running of the particulars and paperwork for the project.

NONDISCRIMINATION COMPLIANCE STATEMENT

REV. 3-88 P&C

COMPANY NAME

CSU, Chico Research Foundation

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

Jeff Wright

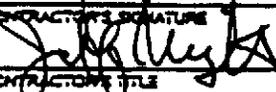
DATE EXECUTED

2/25/97

EXECUTED IN THE COUNTY OF

Butte

PROSPECTIVE CONTRACTOR'S SIGNATURE



PROSPECTIVE CONTRACTOR'S TITLE

Director, Office of Sponsored Programs

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

CSU, Chico Research Foundation