Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

Project Information

1. **Proposal Title:**

   Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

2. **Proposal applicants:**

   Vieva Swearingen, Cottonwood Creek Watershed Group

3. **Corresponding Contact Person:**

   Vieva Swearingen
   Cottonwood Creek Watershed Group
   P.O. Box 1198 3233 Brush Street Cottonwood, California 96022
   530 347-6637
   ccwg@shasta.com

4. **Project Keywords:**

   Channel Dynamics
   Environmental Engineering
   Fluvial Geomorphology

5. **Type of project:**

   Implementation_Pilot

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

   No

7. **Topic Area**:

   Channel Dynamics and Sediment Transport

8. **Type of applicant:**

   Private non-profit

9. **Location - GIS coordinates:**

   Latitude: 40.371

   Longitude: -121.340

   Datum:

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

Two demonstration project sites on the main stem of Cottonwood Creek just upstream of the confluence with the south fork of Cottonwood Creek in Tehama and Shasta counties approximately 10 miles upstream of the confluence with the Sacramento River.

10. **Location - Ecozone:**

    5.2 Lower Cottonwood Creek

11. **Location - County:**

    Shasta, Tehama

12. **Location - City:**

    Does your project fall within a city jurisdiction?

    No

13. **Location - Tribal Lands:**

    Does your project fall on or adjacent to tribal lands?

    No

14. **Location - Congressional District:**

    4

15. **Location:**

    California State Senate District Number: 2

    California Assembly District Number: 3

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

    1

17. **Requested Funds:**
    a) Are your overhead rates different depending on whether funds are state or federal?

       No

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

       Single Overhead Rate: 10%

       Total Requested Funds: $384,614

b) Do you have cost share partners already identified?

No

c) Do you have potential cost share partners?

No

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

No

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

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

No

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

Yes

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

98-EO5 Cottonwood Creek Watershed Group Formation ERP

2000-EO3 Cottonwood Creek Watershed Monitoring and Assessment ERP

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

No

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

No

20. **Is this proposal for next-phase funding of an ongoing project funded by an entity other than CALFED or CVPIA?**

No

Please list suggested reviewers for your proposal. (optional)

21. **Comments:**

Environmental Compliance Checklist

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

1. **CEQA or NEPA Compliance**
   a) Will this project require compliance with CEQA?

      Yes
   b) Will this project require compliance with NEPA?

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

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

   CEQA Lead Agency: California Department of Fish and Game
   NEPA Lead Agency (or co-lead:) U.S. Fish and Wildlife Service
   NEPA Co-Lead Agency (if applicable):

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

   CEQA
   -Categorical Exemption
   XNegative Declaration or Mitigated Negative Declaration
   -EIR
   -none

   NEPA
   -Categorical Exclusion
   XEnvironmental Assessment/FONSI
   -EIS
   -none

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

4. **CEQA/NEPA Process**
   a) Is the CEQA/NEPA process complete?

      No

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

      Draft in May 2003; final in July 2003

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

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

LOCAL PERMITS AND APPROVALS

Conditional use permit	Required
Variance	
Subdivision Map Act	
Grading Permit	Required
General Plan Amendment	
Specific Plan Approval	
Rezone	
Williamson Act Contract Cancellation	
Other	

STATE PERMITS AND APPROVALS

Scientific Collecting Permit	
CESA Compliance: 2081	Required
CESA Compliance: NCCP	
1601/03	Required
CWA 401 certification	Required
Coastal Development Permit	
Reclamation Board Approval	Required
Notification of DPC or BCDC	
Other	

FEDERAL PERMITS AND APPROVALS

ESA Compliance Section 7 Consultation	Required
ESA Compliance Section 10 Permit	
Rivers and Harbors Act	
CWA 404	Required
Other	

PERMISSION TO ACCESS PROPERTY

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: Sartori and Baker	Required, Obtained

6. **Comments.**

Letters of permission for access to private properties owned by Sartori and Baker are attached to the proposal text.

Land Use Checklist

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

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

   No

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

   Yes

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

   No

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

   Channel restoration demonstration projects.

4. **Comments.**

Conflict of Interest Checklist

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

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

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

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

Applicant(s):

Vieva Swearingen, Cottonwood Creek Watershed Group

Subcontractor(s):

Are specific subcontractors identified in this proposal? Yes

If yes, please list the name(s) and organization(s):

Mike Urkov CH2M HILL, Inc.

Helped with proposal development:

Are there persons who helped with proposal development?

No

Comments:

Budget Summary

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

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

Independent of Fund Source

Year 1												
Task No.	**Task Description**	**Direct Labor Hours**	**Salary *(per year)***	**Benefits *(per year)***	**Travel**	**Supplies & Expendables**	**Services or Consultants**	**Equipment**	**Other Direct Costs**	**Total Direct Costs**	**Indirect Costs**	**Total Cost**
1	Landowner and agency coordination	320	6,400	2,048			42,000			50448.0	5,045	55493.00
2	Conceptual design						56,000			56000.0	5,600	61600.00
3	Preliminary design						48,000			48000.0	4,800	52800.00
4	Final design						80,000			80000.0	8,000	88000.00
5	Project implementation Plan	40	800	256			53,000			54056.0	5,406	59462.00
6	Monitoring plan	40	800	256			23,000			24056.0	2,406	26462.00
7	Project management	420	8,400	2,688			26,000			37088.0	3,709	40797.00
		820	16400.00	5248.00	0.00	0.00	328000.00	0.00	0.00	349648.00	34966.00	384614.00

Year 2												
Task No.	**Task Description**	**Direct Labor Hours**	**Salary *(per year)***	**Benefits *(per year)***	**Travel**	**Supplies & Expendables**	**Services or Consultants**	**Equipment**	**Other Direct Costs**	**Total Direct Costs**	**Indirect Costs**	**Total Cost**
		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Year 3												
Task No.	**Task Description**	**Direct Labor Hours**	**Salary *(per year)***	**Benefits *(per year)***	**Travel**	**Supplies & Expendables**	**Services or Consultants**	**Equipment**	**Other Direct Costs**	**Total Direct Costs**	**Indirect Costs**	**Total Cost**
		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grand Total=384614.00

Comments.

Budget Justification

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

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

A total of 820 hours are estimated for CCWG staff over the course of the project. CCWG Executive Director, Vieva Swearingen would provide this labor. The CCWG is considering adding another staff person, in which case the hours would be allocated between two people.

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

$20/hour

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

32%

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

None

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

None

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

CH2M HILL, Inc. will perform all tasks. Estimates assume 3,300 hours of labor during the course of the project. Billing rates for proposed consultant staff vary from about $50/hour to $180/hour. We anticipate an average billing rate of $85/hour. Expenses are at 15 percent.

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

None

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

Project management functions to administer the contract, prepare and submit required reports, and coordinate with the consultant team and funding agencies are estimated to require 20 percent of the CCWG Executive Director’s time over the life of the project.

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

None

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

Indirect costs are estimated at 10 percent for general office requirements such as phone, rent, printing, furniture, etc.

Executive Summary

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

This is a channel restoration demonstration project at two sites on the main stem of Cottonwood Creek, Tehama County, approximately 10 miles upstream of the Sacramento River confluence. The objective is to restore the channel to a more natural configuration to contribute to restoration of natural stream meander, sediment transport and deposition, floodplain interactions, and other natural dynamic fluvial processes. Restoration of these processes would contribute to re-establishment of natural streamflow conditions and riparian and fisheries habitat. The hypothesis is that it is possible to engineer restoration projects that encourage natural processes and yield substantial benefits for both environmental and human uses in the basin. The approach includes developing, screening, and evaluating conceptual design alternatives in consultation with stakeholders and agency staff; preliminary design of the preferred alternative selected through a NEPA/CEQA process; final design and permitting; and moni-toring plan development. Modern restoration techniques will be guided by the CDFG California Salmonid Stream Habitat Restoration Manual. Uncertainties regarding specific design features will be resolved in consultation with stakeholders and agency staff. Expected outcome will be a Conceptual Design Report, Preliminary Design Report, NEPA/CEQA document, Final Design and Construction Bid Package, and a Monitoring Plan. The project addresses the ERP Draft Stage 1 Implementation Plan Goal 1, At Risk Species, Goal 2, Ecosys-tem Processes and Biotic Communities, and Goal 3, Harvestable Species. It also addresses Draft Stage 1 Implementation Plan Restoration Priorities 3 and 7 for the Sacramento Region. It is linked to the Draft Winter-run Salmon Recovery Plan, CVPIA Anadromous Fish Restoration Program, and California Salmon, Steelhead Trout and Anadromous Fisheries Program Act.

Proposal

Cottonwood Creek Watershed Group

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

Vieva Swearingen, Cottonwood Creek Watershed Group

Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

A. Project Description: Project Goals and Scope of Work

1. Problem

The proposed project by the Cottonwood Creek Watershed Group (CCWG or Watershed Group) would enact two channel restoration demonstration projects on the main stem of Cottonwood Creek, located in Tehama County approximately 10 miles upstream of the confluence with the Sacramento River. The problem that the project is designed to address relates to geomorphic conditions and fluvial dynamic processes in the creek, including channel configuration, stream meander, natural floodplains and flood processes, and sediment and gravel transport and deposition. Restoring the main stream channel to a more natural configuration would contribute to restoration of natural stream meander, sediment transport and deposition, floodplain interactions, and other natural processes. Restoration of these processes, in turn, would contribute to re-establishment of natural streamflow conditions and riparian and fisheries habitat.

During preparation of a draft *Cottonwood Creek Watershed Assessment* (currently undergoing technical review) (CH2M HILL, 2001), it was determined that there is a general lack of information available regarding the geomorphologic interactions in the basin. The goal of this project is to develop two demonstration projects founded on a holistic approach to bank protection and channel restoration. The holistic approach, developed through a stakeholder and technical team collaboration, would likely include relatively new, innovative structural improvements, such as those outlined in the California Department of Fish and Game's (CDFG) *California Salmonid Stream Habitat Restoration Manual* (Flosi et al., 1998). In the past, common approaches to bank erosion in the lower reaches of the basin focused on construction of levees, placement of riprap along the banks of the creek, and other similar "hard engineering" fixes. This project would demonstrate the use of techniques capable of achieving multiple benefits, including improvements to water quality (reduction of fine sediments), expanded riparian and instream habitat, and protection of existing land uses.

The specific objective of the project is to develop two demonstration projects that will showcase techniques for reducing excessive sediment discharge and establish a single channel in dynamic equilibrium, thereby improving riparian and fisheries habitat while protecting landowners from severe erosion. Two landowners in the lower basin have indicated a willingness to use their property as test cases for these demonstration projects. This proposal seeks to develop the plans and environmental compliance documentation and permits necessary to implement the demonstration projects. Information from these demonstration projects will help inform resource agencies, landowners, and land managers in the basin. Additionally, lessons learned from these projects would contribute information for future restoration projects that could help restore populations of anadromous fish, improve water quality, and reduce damage from flooding in the basin. The project would operate under the

hypothesis that it is possible to engineer restoration projects that encourage natural processes, and these natural processes can yield substantial benefits for both environmental and human uses in the basin.

2. Justification

The conceptual model that guides this project is derived from the model of natural fluvial conditions and dynamic processes in streams tributary to the Sacramento and San Joaquin rivers as described in Appendix A of CALFED's February 1999 Revised Draft *Strategic Plan for Ecosystem Restoration* (CALFED, 1999a, pages A-1 through A-7). As described in the *Strategic Plan*, when these natural fluvial conditions and dynamic processes are in equilibrium, healthy ecological processes and conditions are established and maintained. These fluvial conditions and processes include channel and bank configuration (i.e., braided channels, meandering channels, riffles, natural levees, bank inclination, bank overhang), channel migration, seasonal flow variability and channel scouring, flooding and floodplain formation, periodic inundation, floodplain and channel interaction, gravel and sediment transport and deposition, and flow volume and velocity. When these conditions and processes are in "natural" equilibrium, they greatly influence water quality and temperature, habitat area and diversity (i.e., aquatic and riparian vegetation and species abundance and diversity); and fish passage, spawning, and rearing conditions.

This conceptual model suggests that by restoring the channel configuration in two locations along Cottonwood Creek, the proposed demonstration projects will test the hypothesis whether, and to what extent, properly implemented channel restoration will influence restoration of natural dynamic fluvial processes. These include stream meander, floodplain, habitat, flow and temperature, and gravel and sediment transport and deposition processes. Assuming that these conditions and processes are restored to a more "natural" state, they will presumably improve ecological processes and conditions in the vicinity of the demonstration projects. These would include restoration and maintenance of riparian and instream habitat and fisheries. Flood damage and excessive erosion and sedimentation also would be reduced.

CALFED states the need for this proposal in its Ecosystem Restoration Program *Draft Stage 1 Implementation Plan* (CALFED, August 2001. Goal 2, Ecosystem Processes and Biotic Communities, recognizes the importance of ecosystem processes in maintaining self-sustaining biotic communities. As stated in the *Draft Stage 1 Implementation Plan*, "Scientific uncertainties that may influence the ability to achieve this goal include questions about … channel dynamics, particularly how they affect habitat restoration." Goal 3 recognizes the importance of maintaining certain species, including chinook salmon, as harvestable species. Goal 4 aims to restore functional habitat types in the Bay-Delta estuary and its watershed. Goal 6 notes the need to improve water and sediment quality.

Draft Stage 1 Implementation Plan Restoration Priority 3 for the Sacramento Region states that "Projects are needed to design and implement ecologically based streamflow and temperature management plans including geomorphic and biological criteria for water acquisitions for Sacramento River Basin tributaries," including Cottonwood Creek. The proposed project is intended to establish physical tools needed for such rehabilitation. The proposed project also responds to *Draft Stage 1 Implementation Plan* Restoration Priority 7, which calls for development of conceptual models for Sacramento River tributaries.

The CALFED Science Program Goals note that the "long-term goal of the CALFED Science Program is to progressively build a body of knowledge that will continually improve the effectiveness of restoration actions, allow the CALFED Program to track restoration progress and allow ever-increasing understanding of the implications of interrelated CALFED Program actions." This project represents implementation of this adaptive management goal. As monitoring data on the demonstration project are developed, compared to pre-project conditions, and distributed, information on project effectiveness will help to guide development of the Cottonwood Creek Watershed Management Plan and associated actions to be taken under the plan. By sharing and exchanging monitoring information with other watershed groups, including the Battle Creek, Mill Creek, and Deer Creek Watershed Conservancies, lessons learned from this project will also help to refine and add to knowledge of the entire Sacramento-San Joaquin system and guide future restoration actions.

Additional scientific justification for this project derives from the CDFG's *California Salmonid Stream Habitat Restoration Manual* (Flosi et al., 1998), which describes "the newest accepted techniques, tools, and concepts in the dynamic field of fish habitat restoration." This manual will guide the design, construction, and monitoring of the project. The manual is in its third edition, indicating that it is evolving through an adaptive management process as feedback from implemented restoration projects continues to inform the fisheries agencies. Monitoring information from the proposed project will contribute to this adaptive management process. Relating this proposed project to the Adaptive Management Process diagram in the *Draft Stage 1 Implementation Plan* (CALFED, 2001), this proposal has identified the problem, established ecosystem goals and objectives, specified a conceptual model, and proposes to undertake a monitored demonstration project to test the stated hypothesis.

Uncertainties regarding specific design features and permitting requirements will be resolved in consultation with key stakeholders and resource agency staff.

3. Approach

Our approach to realizing project goals and objectives includes developing, screening, and evaluating conceptual project alternatives in close coordination with affected landowners, key stakeholders, and participating agencies to maximize the benefits to residents of the watershed and to take advantage of the experience and expertise of agency staff. In addition to involving key stakeholders and agency experts, our approach incorporates professional planning, scientific, and engineering consultants with extensive experience in stream restoration and watershed management to design and implement the project using the most advanced, industry-recognized tools and processes, including photogrammetry and hydraulic modeling software. Those alternatives that survive initial screening will be further developed in a preliminary design process that considers such criteria as cost, land easements and ownership, constructibility, permitting requirements, and potential beneficial and negative environmental effects. An environmental impact documentation process that satisfies NEPA and CEQA requirements will be completed to help select the preferred alternative and to ensure public notification and participation. The preferred alternative then will be designed to a level suitable for construction and final permitting. A monitoring plan will be developed to measure the success of the project in meeting its goals and objectives. The monitoring program and associated reporting and documentation will maximize the development and dissemination of information on the effectiveness of the project and, thereby, contribute to adaptive management

of the Bay-Delta system and associated watershed. Monitoring, which will provide data to compare existing, pre-project conditions to post-project conditions, will indicate whether, and to what extent, the proposed channel restoration methods and techniques contribute to restoration or enhancement of natural fluvial dynamic processes. Assuming that natural fluvial processes are restored to some extent, monitoring will indicate whether, and to what extent, natural ecological processes and conditions also are restored.

Monitoring will enable a test of the hypothesis that it is possible to engineer restoration projects that encourage natural processes, and these natural processes can yield substantial benefits for both environmental and human uses in the basin. To do this, the monitoring program will measure changes from pre-project conditions in such variables as channel geometry, water quality, and available habitat.

Task 1 Landowner and Agency Coordination

The CCWG has developed an extensive network of landowner and agency contacts in the watershed. This project would use that network to convene a demonstration project task force dedicated to developing the proposed projects. The task force would meet approximately once per month over the course of the project to discuss design aspects, environmental issues, and landowner/agency concerns. The task force would access technical support provided by the consulting engineering firm of CH2M HILL.

Task 2 Conceptual Design

Tom Benson of the Natural Resource Conservation Service (NRCS) in Red Bluff previously developed a conceptual approach for the targeted properties involving rock deflectors, root wad placement, and willow plantings. Using this approach as a starting point and coordinating with the landowner/agency task force, this task would develop mapping, surveyed cross sections, conceptual-level drawings, and assess hydraulics using the U.S. Army Corps of Engineers (COE) HEC-RAS 3.0 computer program. Results of the conceptual design would be presented to the task force for comment and refinement.

Task 3 Preliminary Design

Based on the comments and refinements received on the conceptual design task, more detailed drawings will be developed and presented to the landowner/agency task force along with a preliminary design report that documents the rationale and approach reflected in the design drawings.

Task 4 Final Design

Comments and refinements on the preliminary design will be incorporated into a final design package that includes engineering drawings and specifications developed to a level of detail sufficient to allow for construction of the demonstration projects. A final design report would also be prepared documenting the rationale and approach behind the design drawings and specifications.

Task 5 Project Implementation Plan

This task would include efforts involved with completing the environmental documentation required for the project, preparing permit applications required for construction, and recom

mendations for sources of funding for construction. This plan would be submitted in draft form to the landowner/agency task force, then resubmitted as a final draft after considering comments and refinements suggested by the task force.

Task 6 Monitoring Plan

A monitoring plan would be developed to measure the success of the project in terms of improved water quality, terrestrial habitat, instream habitat, and reduced erosion. The plan would be developed in conjunction with the landowner/agency task force, with an emphasis on collecting data that would be valuable to future restoration projects in the watershed.

Task 7 Project Management

The project management task includes developing project instructions, work plan, schedule, staff resource plan, and budgets; monitoring the schedule, expenditures, and work progress; invoicing for work completed; preparing project status reports; and ongoing communications with participating funding agencies.

4. Feasibility

The tasks outlined above require a series of meetings with landowners and agencies, during which decisions will be made regarding the most appropriate features to include in the demonstration projects. Because these features will be developed in a collaborative process with both landowners and regulators, it is anticipated that implementation of the demonstration projects will be very straightforward. Tasks outlined above do not require physically changing the environment, instead deferring construction to a subsequent phase after many details of the project have been agreed on. These efforts will employ standard techniques developed, standardized, and currently used by resource agencies throughout the western United States, including the techniques described in the CDFG's *California Salmonid Stream Habitat Restoration Manual* (Flosi et al., 1998). By employing these standard techniques, the project will provide the Watershed Group, agencies, and other interested parties with a growing body of standard data to develop and adaptively manage projects and strategies to meet the goals and objectives of ERP.

The project involves physical improvements, consisting of restoring the streambed to a single, "natural" channel in equilibrium, at two discrete properties on the main stem of Cottonwood Creek. Feasibility is assumed from the fact that the project will be guided by standard methods developed by a fisheries agency (i.e., CDFG's *California Salmonid Stream Habitat Restoration Manual*), as well as the success of other, similar projects that the consultant team has participated in. The consultant team includes a highly experienced fisheries biologist who is a Certified Fisheries Scientist specializing in anadromous salmonids and a licensed professional engineer who is an expert in watershed hydrology and riparian hydrology and hydraulics and has abundant experience in channel restoration in conjunction with watershed and fisheries restoration projects. Also on the consultant team is a water resources planner with experience in multiple watershed and fisheries restoration projects. All of these individuals have significant experience in working cooperatively with staff of resource agencies, including California Department of Water Resources (DWR), CDFG, California Department of Forestry and Fire Protection (CDF&FP), COE, U.S. Department of Reclamation (Reclamation), U.S. Fish and Wildlife Services (USFWS), and National Marine Fisheries Service

(NMFS). Staff of these and other agencies and organizations serve on the CCWG Technical Advisory Committee (TAC). The TAC participates in and advises the CCWG on all CCWG activities, including development of the ongoing *Cottonwood Creek Watershed Assessment.* Participation by these agency representatives also enhances the feasibility of the proposed project by ensuring, along with the consultant team, that project design and the associated monitoring program are technically sound.

The consultant team project planner, who is an expert in the regulatory requirements of water resources projects, will identify all project environmental documentation and permitting requirements during the conceptual design task (Task 1). It is anticipated that the project will require an EA/Negative Declaration to satisfy NEPA and CEQA requirements. All necessary permits and approvals will be obtained during the project implementation task (Task 5). Permits and approvals presently anticipated to apply are listed in the Environmental Checklist Form.

The owners of the two affected properties are willing participants in the development of the project. Letters of permission for access to their properties are included as <Attachment 1>. Depending on the final design of the rehabilitation sites, it is possible that access will be required on private lands in addition to those specifically identified above. Private landowners will be consulted to determine their willingness to participate in the program. The Cottonwood Creek Watershed Group, established as a stakeholder group, is the appropriate entity to facilitate this effort as it maintains a mailing list of over 2,400 households and businesses within the Cottonwood Creek basin and has successfully mobilized hundreds of people in the watershed to participate in CCWG meetings and other activities and to help develop the *Cottonwood Creek Watershed Assessment.*

5. Performance Measures

The proposed project is a demonstration project. It will provide valuable lessons in the applicability and effectiveness of modern techniques on habitat improvement and resource management. However, the project itself is experimental in nature. It is possible that the project itself could fail, while still providing a knowledge base for use on other, future projects. Thus, data developed in conjunction with this project will be used in conjunction with the ongoing *Cottonwood Creek Watershed Assessment* to develop a Cottonwood Creek Watershed Management Plan and specific management and restoration actions that will be implemented under the Plan. Ultimately, the data to be collected and analyzed as a result of this project will be used to evaluate the performance of future management and restoration actions and refine those actions to optimize performance in an adaptive management framework.

Development of the project monitoring plan is a specific task of this proposal (Task 6). It is presently anticipated that the types and categories of data to be collected to help monitor the effectiveness of the demonstration projects in restoring natural dynamic fluvial processes may include surveys of stream cross sections, photo interpretation of pre- and post-project conditions, and physical surveys to measure changes.

6. Data Handling and Storage

For this project, we will use a broad range of information management tools and systems. The following are general examples of the types of tools available to manage and provide access to project data:

- E-mail with file attachments (Microsoft Exchange server with Microsoft Outlook client)
- Microsoft Office suite of desktop applications (Word, Excel, Access, PowerPoint)
- Additional desktop applications (e.g., Visio, Acrobat Reader, Internet Explorer, Microsoft Project)
- Intranet-deployed reference material and project/client-specific websites

All project reports described above will be circulated to CALFED agencies per the standard terms and conditions. They also will be circulated to CCWG TAC members, among whom are representatives of 10 local, state, and federal agencies, including the relevant fisheries and resource agencies, to facilitate information accessibility. The CCWG also maintains communications with other watershed groups, including the Battle Creek, Mill Creek, and Deer Creek Watershed Conservancies, and these groups all share accessibility to detailed watershed information that they develop.

7. Expected Products/Outcomes

This project will be designed and constructed by professional engineering consultants. The approach includes formulating, screening, and evaluating design alternatives through an iterative conceptual design process that will involve agency staff and stakeholder input. Viable alternatives will be further developed and refined through a preliminary design process and evaluated through a CEQA/NEPA environmental impact documentation process. The preferred alternative selected through these processes will be developed through final design, culminating in construction and long-term monitoring. The products of these processes will include a Conceptual Design Report, Preliminary Design Report, NEPA/CEQA document, Final Design and Construction Bid Package, and a Monitoring Plan.

As with all CCWG activities, this work will be undertaken with the full participation of the CCWG membership, Board of Directors, and TAC. Presentations, information transfers, and opportunities for input by the general membership and interested public will occur throughout the 3-year project duration at regular, publicly announced monthly CCWG meetings, twice-monthly Board of Directors meetings, and periodic TAC meetings. Additional opportunities for disseminating information and for meaningful public involvement will occur through the CEQA/NEPA process and associated public participation procedures. As noted above, project monitoring data will be shared with other watershed groups, including the Battle Creek, Mill Creek, and Deer Creek Watershed Conservancies.

8. Work Schedule

The proposed project schedule is shown on Figure 1.

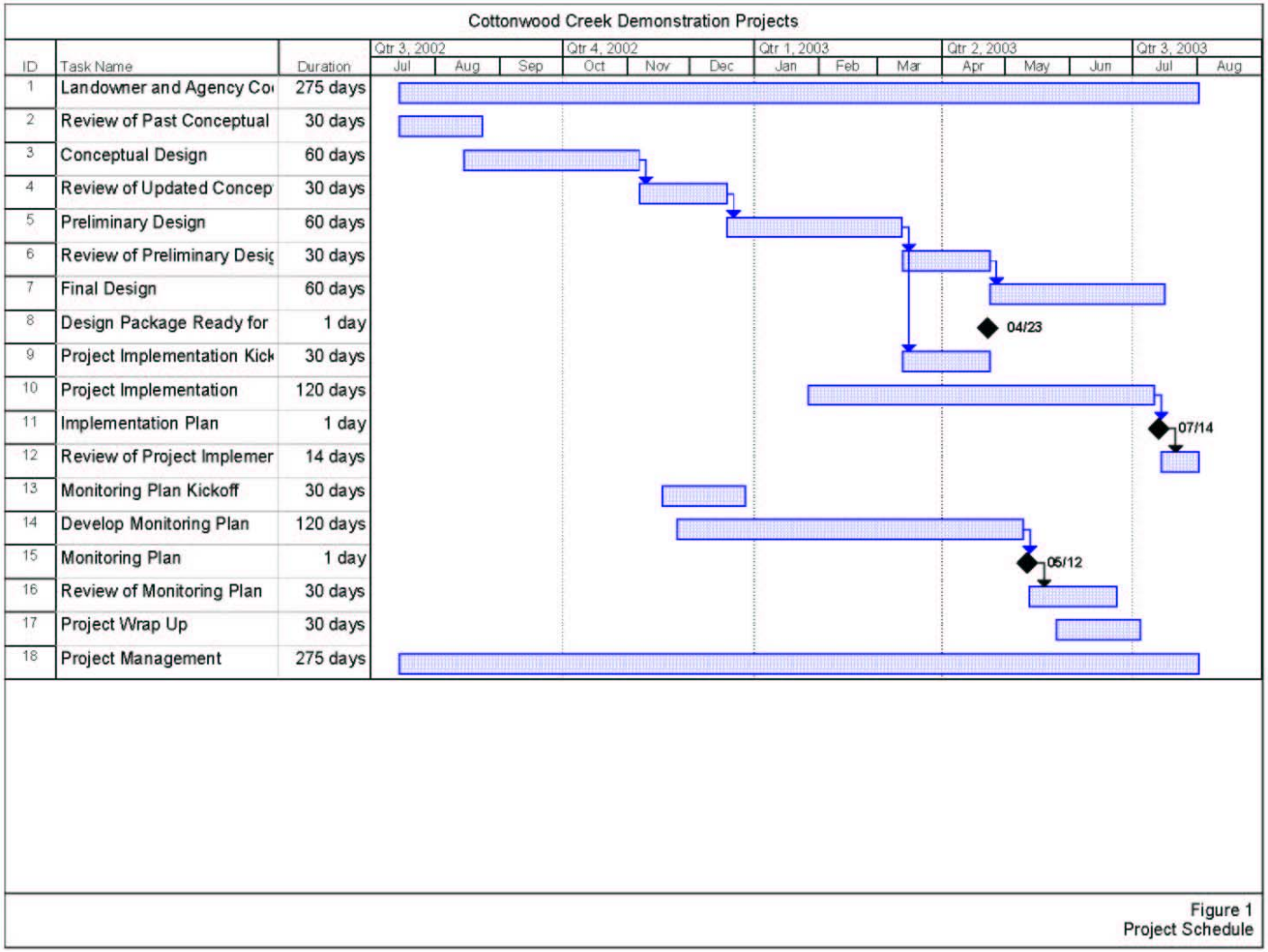

Figure 1
Project Schedule

B. Applicability to CALFED ERP and Science Program Goals and Implementation Plan and CVPIA Priorities

1. ERP, Science Program, and CVPIA Priorities

CALFED states the need for this proposal in its August 2001 Ecosystem Restoration Program *Draft Stage 1 Implementation Plan* (CALFED, 2001). Goal 1, At Risk Species, notes the current state of uncertainty regarding why at-risk species are in decline and how best to facilitate the recovery of these species. As stated in the *Draft Stage 1 Implementation Plan*, "Goal 1 places highest priority on restoring populations of at-risk species such as … chinook salmon and steelhead trout." Goal 2, Ecosystem Processes and Biotic Communities, forwards the goal of rehabilitating natural systems in the Bay-Delta system. Goal 3 recognizes the importance of maintaining certain species, including chinook salmon, as harvestable species.

Draft Stage 1 Implementation Plan Restoration Priority 3 for the Sacramento Region states that "Projects are needed to design and implement ecologically based streamflow and temperature management plans including geomorphic ad biological criteria for water acquisitions for Sacramento River Basin tributaries," including Cottonwood Creek. The proposed project is intended to establish baseline data needed for such restoration. The proposed project also responds to *Draft Stage 1 Implementation Plan* Restoration Priority 7, which calls for development of conceptual models for Sacramento River tributaries.

The CALFED Science Program Goals note that the "long-term goal of the CALFED Science Program is to progressively build a body of knowledge that will continually improve the effectiveness of restoration actions, allow the CALFED Program to track restoration progress and allow ever-increasing understanding of the implications of interrelated CALFED Program actions." This project represents implementation of this goal.

The February 1999 Revised Draft CALFED *Ecosystem Restoration Program Plan* (ERPP),Volume II (CALFED, 1999b) notes that Cottonwood Creek has been identified as Essential Fish Habitat according to NMFS criteria. The proposed project will provide baseline information that will better enable CCWG and other parties to address the ERPP Restoration Targets and Programmatic Actions for the Cottonwood Creek Ecological Management Zone. Among these are restoration of stream meander, which consists of developing "a cooperative program to mechanically create a more defined stream channel in lower Cottonwood Creek." As suggested by the CALFED conceptual model described above, as well as by the ERPP, restoration of these dynamic fluvial processes should contribute to the ecological restoration goals and targets for the Cottonwood Creek watershed, such as restored riparian and riverine aquatic habitats and restored freshwater fish habitat and essential fish habitat.

2. Relationship to Other Ecosystem Restoration Projects

The resource agencies have been seeking better understanding of factors affecting fish populations in the Sacramento River and its tributaries for over 100 years. This proposal is submitted under the assumption that restoration of the Cottonwood Creek channel, natural geomorphic functions, flows, and aquatic and riparian habitats will significantly contribute to restoration of the native fisheries. Other ongoing projects and programs that these efforts, including the currently proposed project, are linked to include the CALFED Bay-Delta Program, Draft Winter-run Salmon Recovery Plan, Central Valley Project Improvement Act

(CVPIA) through the Anadromous Fish Restoration Program (AFRP), and the California Salmon, Steelhead Trout and Anadromous Fisheries Program Act of 1988. The CCWG Technical Advisory Committee, which includes representatives of USFWS, NMFS, CDFG, DWR, and the Central Valley Regional Water Quality Control Board (CVRWQCB), will provide project input as part of their ongoing efforts.

3. Requests for Next-phase funding

This proposal is not a request for next-phase funding.

4. Previous Recipients of CALFED program or CVPIA funding

In its vision for the Cottonwood Creek Ecological Management Zone in Volume II of CALFED's ERPP (CALFED, 1999b, page 225), it states that "The creation of a watershed management plan by a local watershed conservancy or planning agency is necessary." Acting on this vision, a group of local landowners and collaborating or participating agencies and industrial interests joined with the intent to form the CCWG to coordinate local stakeholder and agency efforts to manage the watershed. CALFED awarded **Grant No. 98-EO5** to organize the CCWG.

The ERPP (CALFED, 1999b, page 227) states that "Restoration of this Ecological Management Zone requires developing and implementing a comprehensive watershed management program for the upper and lower areas." Recognizing that the first step in developing a watershed management plan is to compile existing watershed baseline data and identify gaps in the data, CCWG applied for and received CALFED **Grant No. 2000-EO3** for the *Cottonwood Creek Watershed Assessment*, currently in progress. A draft *Cottonwood Creek Watershed Assessment* report has been produced and is currently undergoing technical review by resource agency representatives and other stakeholders.

5. System-Wide Ecosystem Benefits

From Shasta Dam to the Delta, tremendous efforts have been made in the past 10 years by the state and federal resource agencies, Reclamation, water diverters, and others to improve habitat, water temperature, and fish passage, with mixed results. Improving the knowledge base of fisheries information will allow for better understanding of the success or limitations of these projects. This information will allow for valuable comparisons with other tributaries in the Valley that have both similar and different characteristics.

The ERPP, Volume II, notes that Cottonwood Creek is important because it is "the largest undammed tributary (to the Sacramento River) on the westside of the Sacramento Valley," and it is "the primary source of coarse sediments and spawning gravel for the Sacramento River" (CALFED, 1999b, page 221). The ERPP, Volume II, also states that Cottonwood Creek constitutes "Essential Fish Habitat" under NMFS criteria (CALFED, 1999b, page 226). The proposed demonstration project seeks to show that properly designed channel restoration can provide the following ecological benefits:

- Reduction of excessive sedimentation
- Establishment of a single channel in dynamic equilibrium
- Improved riparian and aquatic fisheries habitat
- Improved water quality

These ecological benefits, in turn, would contribute to anadromous fisheries restoration in Cottonwood Creek. All of these benefits would contribute to overall improvement in the ecological health of the Sacramento River watershed downstream of the project and the Bay-Delta system. Additionally, the project is designed to demonstrate that proper channel restoration can provide non-ecological benefits, such as reduced erosion and improved flood control.

6. Additional Information for Proposals Containing Land Acquisition

This proposal does not include a provision for land acquisition.

C. Qualifications

The Cottonwood Creek Watershed Group is a group of landowners, with some families having lived in the watershed since the late 1800s. These landowners are integrating with more recently arrived residents, business owners, and other private parties to improve watershed conditions and habitat.

The CCWG formed under a CALFED grant and is successfully conducting a watershed assessment under another CALFED grant in cooperation with appropriate resource agencies, which are represented on the CCWG TAC. CCWG will review the work products and consult with other groups and agencies, such as Battle Creek, Mill Creek, and Deer Creek Watershed Conservancies; State and County Farm Bureaus; the Anderson-Cottonwood Irrigation District; Sierra Pacific Industries; and CDFG, USFWS, and other resource agencies to support the efforts of this project.

The CCWG includes the participants and collaborators shown in the following table:

CCWG Participants and Collaborators

Landowners	COE
Shasta County Farm Bureau	USFWS
Tehama County Farm Bureau	CDFG
Anderson-Cottonwood Irrigation District	Tehama County Resource Conservation District
Sierra Pacific Industries	Western Shasta Resource Conservation District
Homeowners associations	Natural Resource Conservation Service
Timber managers	DWR
Water companies	Gravel extractors
Fishing guides	Other interested parties

CH2M HILL, one of the largest U.S. firms providing comprehensive engineering, scientific, economic, and planning expertise for large-scale, complex fishery and water resources projects, has been involved in this project and other Cottonwood Creek projects, such as the Cottonwood Creek Watershed Assessment, since CCWG's inception. CCWG selected CH2M HILL as a subcontractor for its experience in water resources science and planning in California and CCWG's positive experience with the firm. CH2M HILL has served Reclamation, DWR, and numerous northern California water and irrigation districts for more than 50 years and has worked on many fisheries and stream restoration projects throughout the Sacramento Valley.

Vieva Swearingen, CCWG Executive Director and Project Administrator
Vieva Swearingen has been directly associated with the Cottonwood Creek Watershed Group since its inception in April 1998 and was one of the original members of the CCWG Steering Committee. In September 2000, CCWG officially became a 501-C-3 non-profit organization and has been the watershed's steward since that time. The group consists of landowners and business owners coordinating with other groups, the local community, and agencies. The CCWG mailing list includes 2,400 addresses. Hundreds of people have attended monthly stakeholder CCWG meetings, and 20 to 40 people regularly attend. The 7-member Board of Directors meets monthly. The TAC includes 17 individuals from 10 local, state, and federal agencies and private industry. Ms. Swearingen is the responsible fiscal agent who operates the CCWG and coordinates all CCWG activities. After formation, Ms. Swearingen developed and submitted the successful CALFED grant proposal for the Cottonwood Creek Watershed Assessment. She is the responsible fiscal agent who is administering the CALFED grant for this project, which is now well underway and proceeding within budget and on schedule.

Mike Urkov, Consultant Team Project Manager
M.A., Water Resources Administration; B.S., Political Economy of Natural Resources
Mike Urkov is a water resources specialist with expertise in NEPA/CEQA and experience in coordinating with federal and state agencies to acquire permits and approvals. He is currently managing CH2M HILL's efforts in helping the CCWG produce the *Cottonwood Creek Watershed Assessment*. He managed environmental and permitting tasks for the Anderson-Cottonwood Irrigation District's Sacramento River Fish Passage Improvement Project involving a new fish screen and ladders. He is managing environmental and permitting tasks, including NEPA/CEQA documentation, for the Tehama-Colusa Canal Authority's Fish Passage Improvement Project at the Red Bluff Diversion Dam.

Tim Hamaker, Fisheries Biologist
B.S., Fisheries Biology; Certified Fisheries Scientist: American Fisheries Society
Tim Hamaker has more than 24 years of experience managing fisheries habitat inventories, aquatic ecological investigations, and water quality assessments. He prepared a biological assessment for Reclamation to evaluate the effects of CVPIA implementation on Sacramento-San Joaquin river temperatures and flows and the effects on anadromous fish. He was the fisheries biologist for the recently constructed Anderson-Cottonwood Irrigation District's Sacramento River Fish Passage Improvement Project involving a new fish screen and ladders. He was fisheries biologist for the award-winning Butte Creek Siphon and Dam Removal Project and the Mainstem Trinity River Fisheries Restoration EIS/EIR for the USFWS and Reclamation. He evaluated results of water quality modeling to analyze effects of the proposed expansion of Spring Creek Debris Dam on long-term recovery of anadromous salmonids in the Sacramento River near Redding. He contributed to the Phase 1 Report for the Comprehensive Anadromous Monitoring Plan (CAMP) for USFWS.

Ken Iceman, P.E., Lead Project Engineer/Hydrology/Hydraulics
B.S., Mathematics; M.S., Civil Engineering; Registered Civil Engineer: California
Ken Iceman has more than 27 years of hydrology and hydraulics experience. He managed the hydraulic monitoring program for GCID interim fish screen performance, designed the training wall and bypass channel system, and managed the GCID permanent fish screen and Sacramento River gradient restoration feasibility study. He provided hydraulic modeling, op

timized screen hydraulics, and maximized anadromous fish protection for RD-108's Sacramento River Wilkins Slough positive barrier fish screen. He conducted hydraulic modeling in support of the award-winning Butte Creek Siphon and Dam Removal Project, which provided anadromous salmonids with access to 25 miles of Butte Creek spawning habitat for the first time in 80 years. He modeled river hydrology and hydraulics, developed fish screen design and sizing criteria, modeled fish ladder hydraulics, and provided fish ladder design criteria for the Anderson-Cottonwood Irrigation District's Fish Passage Improvement Project on the Sacramento River in Redding. He is providing similar expertise for the Tehama-Colusa Canal Authority's Fish Passage Improvement Project at the Red Bluff Diversion Dam.

Mark Tompkins, Hydrology, Geomorphology, and Stream Restoration
M.S., Environmental Engineering; B.S., Civil Engineering
Mark Tompkins is a project engineer and stream restoration specialist at CH2M HILL where he developed the firm's national Stream Restoration Initiative. He has extensive project experience in ecological engineering, water resources engineering, hydrology, fisheries biology, fluvial geomorphology, and stream restoration. He has performed geomorphic assessments for stream restoration projects on Best Slough and Lower Silver Creek in California, and on Sugarland Run in Washington, D.C. He has assessed the potential effects of changes in hydrology and sediment transport on the Sacramento River. He also has expertise in hydraulic and hydrologic models, and has completed detailed analyses of proposed channel modifications on major river systems in California.

D. Cost

1. Budget

The project budget summary and budget justification are presented in Forms VI and VII, respectively.

2. Cost-Sharing

Although no specific cost share partners have been identified, a number of individuals and agencies donate time and effort to public outreach and technical meetings. These in-kind cost share efforts are substantial, with hundreds of hours donated each year by active CCWG participants. These participants include the 17 TAC members who guide all CCWG technical undertakings. Among the TAC members are representatives of 10 local, state, and federal agencies, including the relevant fisheries and resource agencies, as well as representatives of local business and industrial concerns. Further, in the efforts outlined in this proposal, additional opportunities for in-kind contributions will be actively solicited. Potential contributors include CDFG, USFWS, DWR, RWQCB, local landowners, stakeholders, and schools throughout the watershed.

E. Local Involvement

The CCWG maintains an active outreach program to educate and inform the public and promote broad community participation. Monthly stakeholder meetings have been attended by hundreds of individuals, and 2,400 households and businesses receive notices of these meetings. The CCWG TAC includes 17 members who are associated with 10 local land use planning and local, state, and federal resource agencies. Please refer to Item C, Qualifications,

above for a list of public agencies and organizations that participate in the CCWG. Information from the project and its associated monitoring program will be distributed to a diverse set of stakeholder and agency representatives. CCWG will integrate its monitoring strategies with those of the U.S. Forest Service, NMFS, CDFG, USFWS, and other agencies to add to a body of standardized data.

The CCWG membership is aware of and supportive of the project. Members of the CCWG TAC, which includes representatives of the Tehama County government and state and federal resource agencies, also are aware of and supportive of the project. Third-party impacts of the project would be mitigated under requirements of CEQA and NEPA. However, it should be noted that many third-party impacts, such as improved water quality, reduced erosion and sedimentation, and enhanced flood protection, are beneficial. Indirect effects of the project, anticipated to include improved habitat values and fisheries, also are beneficial.

F. Compliance with Standard Terms and Conditions

The CCWG agrees to comply with the Standard Terms and Conditions.

G. Literature Cited

CALFED. 2001. *Ecosystem Restoration Program Draft Stage 1 Implementation Plan.* August.

CALFED. 1999a. Revised Draft *Strategic Plan for Ecosystem Restoration.* February.

CALFED. 1999b. Revised Draft *Ecosystem Restoration Program Plan, Volume II: Ecological Management Zone Visions.* February.

CH2M HILL. 2001. Draft *Cottonwood Creek Watershed Assessment.* Prepared for Cottonwood Creek Watershed Group, Cottonwood, California.

Flosi, Gary, Scott Downey, James Hopelain, Michael Bird, Robert Coey, and Barry Collins. 1998. *California Salmonid Stream Habitat Restoration Manual,* Third Edition. California Department of Fish and Game. January.

Attachment 1
Letters of Permission for Property Access

October 1, 2001

Ms. Vieva Swearingen, Executive Director
Cottonwood Creek Watershed Group
P.O. Box 1198
Cottonwood, California 96022

Subject: Channel Restoration on Cottonwood Creek, Phase 1, Demonstration Project Development

Dear Ms. Swearingen:

I was pleased to learn that my property along Cottonwood Creek is the potential site of a channel restoration demonstration project. I support the Cottonwood Creek Watershed Group's programs and activities, and I believe that the project will be beneficial to residents of the watershed. I understand that the benefits will include improved erosion control, flood protection, water quality, and fisheries restoration.

I hereby grant permission to the staff of the Cottonwood Creek Watershed Group, its consultants, and the participating agencies to access my property to facilitate the design and implementation of this project. I look forward realizing the benefits of the project.

Sincerely,

Harry A. Bahn

October 1, 2001

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Sincerely,

Boyd Rantone