Anadromous Fish Monitoring in Cottonwood Creek Basin

Project Information

1. **Proposal Title:**

   Anadromous Fish Monitoring in Cottonwood Creek Basin

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:**

   Anadromous salmonids
   Fishery Assessment
   Monitoring

5. **Type of project:**

   Monitoring

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

   No

7. **Topic Area**:

   At-Risk Species Assessments

8. **Type of applicant:**

   Private non-profit

9. **Location - GIS coordinates:**

   Latitude: 40.390

   Longitude: -121.280

   Datum:

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

Cottonwood Creek, including North, Middle, and South Forks, in Tehama and Shasta counties.

10. **Location - Ecozone:**

    5.1 Upper Cottonwood Creek, 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:**

    3

15. **Location:**

    California State Senate District Number: 4

    California Assembly District Number: 2

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

    3

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

       No

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

       Single Overhead Rate: 10%

       Total Requested Funds: $1,498,597

    b) Do you have cost share partners already identified?

       No

    c) Do you have potential cost share partners?

Yes

If yes, list partners and amount contributed by each:

California Department of Fish and Game $0 to date

U.S. Fish and Wildlife Service $0 to date

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

Anadromous Fish Monitoring in Cottonwood Creek Basin

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.

      Prior to October of the first year of monitoring.

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

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

LOCAL PERMITS AND APPROVALS

Conditional use permit

Variance

Subdivision Map Act

Grading Permit

General Plan Amendment

Specific Plan Approval

Rezone

Williamson Act Contract Cancellation

Other

STATE PERMITS AND APPROVALS

Scientific Collecting Permit	Required
CESA Compliance: 2081	Required
CESA Compliance: NCCP	
1601/03	
CWA 401 certification	
Coastal Development Permit	
Reclamation Board Approval	
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	
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:

6. **Comments.**

The primary area of environmental concern for this project is the potetential take of spring-run juvenile chinook salmon during outmigration trapping. This would necessitate that permitting and environmental compliance be completed prior to October of the first year of monitoring.

Land Use Checklist

Anadromous Fish Monitoring in Cottonwood Creek Basin

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).

   Primarily monitoring. Establishment of as many as 10 flow and temperature monitoring stations on Cottonwood Creek and its tributaries.

4. **Comments.**

   Agreements regarding specific access points to gages on the creek will be obtained during selection of gage locations.

Conflict of Interest Checklist

Anadromous Fish Monitoring in Cottonwood Creek Basin

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?

Yes

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

Mike Berry California Department of Fish and Game

Tricia Bratcher California Department of Fish and Game

Comments:

Budget Summary

Anadromous Fish Monitoring in Cottonwood Creek Basin

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	Gaging Station Installation and Monitoring						100,000	50,000		150000.0	15,000	165000.00
2	Adult salmonid surveys						195,000			195000.0	19,500	214500.00
3	Juvenile salmonid surveys						63,000	25,000		88000.0	8,800	96800.00
4	Public involvement and agency coordination	320	6,400	2,048			40,000			48448.0	4,845	53293.00
5	Reporting and documentation	60	1,200	384			25,000			26584.0	2,658	29242.00
6	Project management	420	8,400	2,688			20,000			31088.0	3,109	34197.00
		800	16000.00	5120.00	0.00	0.00	443000.00	75000.00	0.00	539120.00	53912.00	593032.00

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**
1	Gaging station installation						35,000			35000.0	3,500	38500.00
2	Adult salmonid surveys						195,000			195000.0	19,500	214500.00
3	Juvenile salmonid surveys						63,000			63000.0	6,300	69300.00
4	Public involvement and agency coordination	320	6,400	2,048			40,000			48448.0	4,845	53293.00
5	Reporting and documentation	40	800	256			20,000			21056.0	2,106	23162.00
6	Project management	420	8,400	2,688			15,000			26088.0	2,609	28697.00
		780	15600.00	4992.00	0.00	0.00	368000.00	0.00	0.00	388592.00	38860.00	427452.00

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**
1	Gaging station installation						35,000			35000.0	3,500	38500.00
2	Adult salmonid surveys						195,000			195000.0	19,500	214500.00
3	Juvenile salmonid surveys						63,000			63000.0	6,300	69300.00
4	Public involvement and agency coordination	320	6,400	2,048			40,000			48448.0	4,845	53293.00
5	Reporting and documentation	80	1,600	512			60,000			62112.0	6,211	68323.00
6	Project management	420	8,400	2,688			20,000			31088.0	3,109	34197.00
		820	16400.00	5248.00	0.00	0.00	413000.00	0.00	0.00	434648.00	43465.00	478113.00

Grand Total=1498597.00

Comments.

Budget Justification

Anadromous Fish Monitoring in Cottonwood Creek Basin

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

A total of 2,400 hours are estimated for CCWG staff over the 3-year period, averaging approximately 800 hours per year. Currently, these hours are anticipated to be provided by CCWG Executive Director, Vieva Swearingen. CCWG is considering adding another staff position, in which case the hours would be allocated between two staff members.

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 under this proposal. Estimates assume 6,000 hours of labor in Year 1, 4,800 hours in Year 2, and 5,000 hours in Year 3. Billing rates for proposed consultant staff range from about $30/hour to $180/hour, including overhead. We anticipate an average billing rate of $65/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.

Equipment costs include $50,000 for gage instrumentation and $25,000 for fish trapping equipment. Specifically, as many as 10 field data loggers to record flow and temperature are required. Each flow/temperature/logger is estimated at $5,000. The floating screw trap is estimated at $25,000.

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.

Estimated at 10 percent for general office expenditures, such as rent, phones, printing, furniture, etc.

Executive Summary

Anadromous Fish Monitoring in Cottonwood Creek Basin

This monitoring project would establish an anadromous fisheries monitoring program in the Cottonwood Creek Basin, Tehama and Shasta counties, to document anadromous fish abundance and range in relation to flow and temperature conditions at various life stages. The objective is to build databases that could contribute to restoration of anadromous fish populations to meet Anadromous Fish Restoration Program goals of 5,900 fall-run chinook salmon under the hypothesis that it is possible to extend anadromous fish range through a better understanding of the flow-temperature relationship. The approach is to establish and monitor 10 flow and temperature gages in the mainstem and north, middle, and south forks and correlate these parameters with results of aerial and ground surveys of adult salmonids and screw trap, spot seining, and fyke netting data on range and abundance of juvenile salmonids. Uncertainties are locations of the gages and specific protocols for fish surveys, to be resolved in consultation with key stakeholders and resource agency staff. Uncertainty regarding need and requirements for take permit will be resolved with USFWS. Expected outcomes include a technical memorandum documenting selected gage locations and salmonid survey protocols. Results of each years water and fish monitoring data will be compiled into an annual report. The three annual reports will be compiled into a summary report reviewing and interpreting the collected data. The project addresses ERP Draft Stage 1 Implementation Plan Goal 1, At Risk Species, Goal 2, Ecosystem Processes and Biotic Communities, and Goal 3, Harvestable Species. It also addresses Draft Stage 1 Implementation Plan Restoration Priorities 3 and 7. Section 3406(b)(1) of the CVPIA specifically notes the goal of collecting fish population, health, and habitat data to facilitate evaluation of restoration actions. The project will provide baseline information to address the ERPP Restoration Targets and Programmatic Actions for the Cottonwood Creek Ecological Management Zone. Other ongoing programs that the project is linked to include 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

Anadromous Fish Monitoring in Cottonwood Creek Basin

Vieva Swearingen, Cottonwood Creek Watershed Group

Anadromous Fish Monitoring in Cottonwood Creek Basin

A. Project Description: Project Goals and Scope of Work

1. Problem

The proposed project by the Cottonwood Creek Watershed Group (CCWG) would establish an anadromous fisheries monitoring program in the Cottonwood Creek Basin, a westside tributary to the Sacramento River located at the boundary between Tehama County and Shasta County. The problem that this project addresses was identified during preparation of a draft *Cottonwood Creek Watershed Assessment* (CH2M HILL, 2001), which is currently undergoing technical review. It was determined that there is a general lack of information available regarding the extent of anadromous fisheries in the Cottonwood Creek basin and the physical conditions under which these fish exist.

The goals of this project are to build understanding of the abundance and range of anadromous fish in the basin at various life stages and to document the flow and temperature conditions present during the various life stages of the fish within the basin. The specific objective of the project is to build informational databases that would be useful to resource agencies, landowners, and land managers in the basin. Additionally, monitoring data could contribute information for future restoration projects that could help to restore populations of anadromous fish, specifically fall-run and spring-run chinook salmon and steelhead, to meet Anadromous Fish Restoration Plan goals of 5,900 for fall-run chinook salmon (USFWS, 2001). The project would operate under the hypothesis that it is possible to extend the range of anadromous fish in the basin through a better understanding of the flow-temperature relationship in the major tributaries of the basin.

2. Justification

The conceptual model that guides this project is derived from the CALFED February 1999 Revised Draft *Strategic Plan for Ecosystem Restoration, Appendix A: Opportunities and Constraints* (CALFED, 1999a). Appendix A provides a model of hydrologic, geomorphic, and ecological conditions and processes in the Sacramento and San Joaquin rivers and their tributaries prior to European colonization and contrasts these with current conditions in the basin. According to this model, the effects of activities such as grazing, gold mining, channelization for navigation, artificial bank protection, levee construction, floodplain conversion, draining of wetlands, construction of reservoirs and diversions, sand and gravel extraction, and introduction of non-native species have disrupted natural fluvial processes. These processes include stream meander, channel formation, floodplain formation and periodic inundation, and gravel transport and deposition. These and other disruptions, in turn, have reduced habitat area and diversity, inhibited fish migrations, reduced and altered streamflow, negatively affected water quality, and raised water temperatures. These conditions negatively affect anadromous salmonids in all life stages, while in some cases providing more favorable conditions for warmwater species that prey on juvenile salmonids.

Two critical variables for healthy and productive anadromous salmonid fisheries are streamflow and water temperature. Salmonids require very specific flow and temperature conditions to sustain each life stage. Consequently, an initial step in planning for restoration of the Cottonwood Creek fisheries is to establish baseline data on the present range and population of anadromous fish in the Cottonwood Creek basin in relation to the physical conditions under which these populations exist, particularly streamflow and temperature. These data can then be compared to similar data from other streams, including those that have higher populations of anadromous fish and higher survival rates through all life stages, to identify those conditions that appear most conducive to productive fisheries.

CALFED states the need for this proposal in its August 2001Ecosystem 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 and biological criteria for water acquisitions for Sacramento River Basin tributaries," including Cottonwood Creek. 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, annual fish population estimates, and fish species life histories and environmental requirements. These statements indicate general agreement among fisheries agencies that baseline information on streamflow and temperature conditions in Cottonwood Creek and their relationship to fish abundance and environmental requirements are presently lacking. The scientific uncertainty is, therefore, presently considered to be too great to support implementation of streamflow and temperature management actions. The proposed project is intended to establish baseline data needed to enable subsequent design and implementation of restoration actions.

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.

Section 3406(b)(1) of the CVPIA specifically notes the goal of collecting fish population, health, and habitat data to facilitate evaluation of restoration actions. In sum, these goals provide a firm basis for implementation of an anadromous fisheries monitoring program in the Cottonwood Creek basin.

On the Adaptive Management Process diagram in the *Draft Stage 1 Implementation Plan*, this project represents a research project and reflects several steps in the process. These include stating the problem, establishing goals and objectives, specifying the conceptual model, and undertaking targeted research to develop baseline information pursuant to designing and initiating potential future restoration actions.

The proposed project will test the hypothesis that it is possible to extend the range of anadromous fish in the basin through a better understanding of the flow-temperature relationship in the major tributaries of the basin. It will be tested by enabling direct correlation of the range and abundance of salmonids to the flow and temperature conditions at 10 locations in the basin. These data, in turn, will be compared to corresponding data from other basins. The result will be a detailed understanding of the specific flow and temperature requirements for healthy fisheries in the various reaches of the Cottonwood Creek basin. That understanding will contribute to the design and implementation of flow-temperature management actions to increase anadromous fish range and abundance. Frequent peer review by the CCWG TAC, which includes qualified scientists from relevant public agencies, will help to ensure quality control. The proposal has been designed to utilize the best available standard, agency-accepted monitoring techniques to ensure reliable results.

Uncertainties associated with the project are the locations of the 10 flow and temperature gages and specific protocols for fish range and population surveys. These uncertainties will be resolved in consultation with key stakeholders and resource agency staff as described in the Approach. The need for and requirements of a take permit will be resolved in consultation with the U.S. Fish and Wildlife Service (USFWS).

3. Approach

The project would monitor water flows and temperatures and correlate these parameters with physical surveys of anadromous fish in the basin. Physical surveys would include aerial and ground surveys to determine presence of adult salmonids, as well as screw trap and spot seining to determine presence of juvenile salmonids. Monitoring efforts would concentrate in the mainstem, although monitoring stations and survey efforts would also cover the north, middle and south forks to build better understandings of the physical parameters of these stream reaches and the effect these parameters may have on presence and abundance of salmonids.

Task 1 Gaging Station Installation

Existing data in the watershed are inconsistent. During preparation of the *Cottonwood Creek Watershed Assessment*, 17 stream gages were identified with an incomplete record of 1907 through current. Table 1 lists known gages that were operated in the Cottonwood Creek basin.

TABLE 1
Stations and Record

Station ID	Station Name	Hydrologic Unit	Administrative Agency	County	Basin Name	Period of Record
11374300	Arbuckle Mtn Pp Nr Platina CA	18020113	USGS	Shasta	Cottonwood Headwaters	Nov 1997 - Jun 1999
11374305	MF Cottonwood C below Div to Arbuckle Mtn Pp CA	18020113	USGS	Shasta	Cottonwood Headwaters	Nov 1997 - Jun 1999
CTN	Cottonwood C (USBR)	0	USBR	Tehama	Cottonwood Creek	n/a
11375830	Budden Cyn Nr Beegum CA	18020113	USGS	Tehama	Cottonwood Headwaters	n/a

TABLE 1
Stations and Record

Station ID	Station Name	Hydro-logic Unit	Administra-tive Agency	County	Basin Name	Period of Record
11375500	NF Cottonwood at Ono CA	18020113	USGS	Shasta	Cottonwood Headwaters	Oct 1907 - Sept 1913
11375600	Hulig C Trib at Ono CA	18020113	USGS	Shasta	Cottonwood Headwaters	n/a
11375700	NF Cottonwood C Nr Igo CA	18020102	USGS	Shasta	Lower Cot-tonwood	Oct 1956 - Sept 1980
11374400	MF Cottonwood C Nr Ono CA	18020102	USGS	Shasta	Lower Cot-tonwood	Oct 1956 - Sept 1975
11375810	Cottonwood C Nr Olinda CA	18020102	USGS	Shasta	Lower Cot-tonwood	Aug 1971 - Sept 1986
DVR	Davis Ranch	0	USBR	Tehama	Cottonwood Creek	n/a
11375870	SF Cottonwood C Nr Olinda CA	18020102	USGS	Shasta	Lower Cot-tonwood	Nov 1976 - Sept 1986
11375820	SF Cottonwood C Nr Cottonwood CA	18020102	USGS	Tehama	Lower Cot-tonwood	Oct 1962 - Sept 78
BKR	Baker	0	CA Dept of Forestry	Tehama	Cottonwood Creek	n/a
11375900	SF Cottonwood C A Evergreen Rd Nr Cottonwood CA	18020102	USGS	Tehama	Lower Cot-tonwood	Oct 1981 - Sept 1985
11375815	Cottonwood C Ab SF Nr Cotton-wood CA	18020102	USGS	Tehama	Lower Cot-tonwood	Oct 1981 - Sept 1985
CWA	Cottonwood Creek Auxiliary Gage	0	USGS	Tehama	Cottonwood Creek	n/a
COT	Cottonwood Creek (DWR)	0	CA DWR	Tehama	Cottonwood Creek	
11376000	Cottonwood C Nr Cottonwood CA	18020102	USGS	Tehama	Lower Cot-tonwood	Oct 1940 - current
11375871	Results of Com-bining 11375810 and 11375870 CA	18020102	USGS	Tehama	Lower Cot-tonwood	

NF = North Fork
MF = Middle Fork
SF = South Fork
Pp = Powerplant
C = Creek
Cyn = Canyon
CA = California
Nr = near
USGS = U.S. Geological Survey

The first step to be undertaken under this task is to select 10 gage locations, with preference given to existing gages, and limiting site selection to locations that would not require ground-breaking activities. These gage locations would then be outfitted with data logging equipment to record flow and temperature information (if not existing on the gage; see in Table 1, for example, Station number 11376000 operated by the USGS). Data from these stations would then be collected twice per month to develop general relationships between the different reaches of the basin. Currently, the 10 gage locations are projected to include 4 measurement locations on the mainstem, 2 on the north fork, 2 on the middle fork, and 2 on the south fork.

Selection of locations will occur with the intent of developing step-wise information regarding flow and temperature information in the basin. For example, it is thought that the majority of fall-run chinook salmon only occupy the lower 7 miles of Cottonwood Creek. The study is designed to determine the upstream geographic distribution and timing of chinook salmon presence in the basin. A primary objective of this monitoring program would be to compare flow and temperature characteristics of this reach of stream with upstream reaches of Cottonwood Creek and its tributaries.

Identifying specific gage locations would be undertaken in conjunction with the CCWG Technical Advisory Committee (TAC), which includes representatives of 10 local government and state and federal resource agencies, and also would include participation by landowners potentially affected by new gage installation or upgrades of any existing gages. CCWG's proposed consultant team includes a highly experienced fisheries biologist and an engineer who specializes in watershed hydrology and riparian hydrology and hydraulics in the context of watershed and fisheries restoration. These individuals also would provide expert input regarding gage locations. This task also includes collecting data from the installed gages throughout the project duration and monitoring period.

Task 2 Adult Salmonid Spawner Surveys

Currently, information about the extent and timing of the occurrence of adult anadromous salmonids in the basin is lacking. This task would establish monitoring protocols to document the adult distribution and relative numbers of adult spawners inhabiting the basin. Methods used to survey populations of adults would include aerial flights to conduct redd surveys, on-the-ground redd surveys to validate the aerial surveys, and periodic carcass surveys. These efforts would be conducted twice monthly during the peak spawning periods for spring- and fall-run chinook salmon (August through October) and monthly thereafter. Spawner surveys for steelhead would be conducted twice monthly beginning in December through April when water conditions (high flows and turbidity) allow.

Task 3 Juvenile Salmonid Outmigration Surveys

Currently, information about the relative abundance, spatial distribution, and timing of juvenile anadromous salmonid outmigration in the basin is lacking. This task would establish monitoring protocols to document the outmigration timing and relative abundance of juvenile salmonids within the basin. Methods used to survey outmigrating smolts would include selective trapping using screwtraps, fyke-nets, and/or seining. Depending on sampling methodology, these trapping efforts would be conducted continuously or weekly during the peak

outmigration period for spring-run chinook salmon yearlings (October through December) and fall-run chinook and steelhead smolts (April through June).

Task 4 Public Involvement and Agency Coordination

Public involvement and agency coordination are important tenets of the fish monitoring project. Through regular meetings and targeted outreach, the public participation component of the project will achieve: (1) a better understanding of the watershed and (2) dissemination of technical information to the parties that would be affected by potential future fisheries management. The CCWG TAC includes key resource agency representatives, and the continued interaction with the TAC will ensure appropriate data collection efforts that will be useful on a regional or statewide basis.

CCWG members, participants, and collaborators include Shasta and Tehama county governments, the Shasta and Tehama County Farm Bureaus, Anderson-Cottonwood Irrigation District (ACID), Sierra Pacific Industries, local homeowners' associations, Evergreen and other schools, timber managers, water companies, fishing guides, U.S. Army Corps of Engineers (COE), USFWS, California Department of Fish and Game (CDFG), Tehama County Resource Conservation District (TCRCD), Western Shasta Resource Conservation District (WSRCD), Natural Resource Conservation Service (NRCS), California Department of Water Resources (DWR), Bureau of Land Management (BLM), U.S. Forest Service (USFS), National Marine Fisheries Service (NMFS), California Department of Transportation (Caltrans), University of California Extension, California Department of Forestry and Fire Protection (CDF), gravel extractors, and other interested parties. The TAC includes 17 individuals from 10 local, state, and federal agencies (listed above) and private industry.

The CCWG was formed with the assistance of a CALFED grant in response to urging of local communities and agencies in the watershed that recognized the need for such a coordinating group. The CCWG mailing list includes 2,400 addresses. Hundreds of people have attended monthly CCWG meetings, and 20 to 40 people regularly attend. The 7-member Board of Directors meets twice monthly.

Task 5 Reporting and Documentation

The initial work plan documenting the selection of gage locations as well as the specifics of the proposed adult and juvenile fish survey protocols will be developed into a technical memorandum for review by the CCWG TAC. The final technical memorandum will serve as the governing document for survey protocols throughout the 3-year project duration. Each year's water and fish monitoring data will be compiled into a draft report to be reviewed by the CCWG TAC. This annual report would then be developed into a final report suitable for distribution outside of the CCWG TAC. Following completion of the third year's monitoring efforts, the three annual reports would be compiled into a summary report reviewing and interpreting the data collected in each of the 3 years.

Task 6 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 an initial effort to install equipment at strategic locations along the stream channel, and will require regular monitoring of the equipment to collect relevant data. Additionally, tasks outlined above call for efforts to physically collect survey data regarding the presence and extent of anadromous salmonids. These efforts will employ standard techniques developed, standardized, and currently used by fisheries agencies throughout the western United States. By relying on these standard techniques, the data 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.

Feasibility is indicated by the fact that the standard procedures to be used for this project are being applied by resource agencies in watersheds throughout the western U.S. The use of standard techniques will result in standardized data that are comparable from one watershed to another. Feasibility and appropriateness of the approach are further validated by the fact that the project consultant team includes a highly experienced water resources planner and regulatory specialist, a fisheries biologist, and an engineer with expertise in river system hydrology and hydraulics and watershed and stream restoration. These experts will develop and implement project protocols and procedures in consultation with the CCWG TAC, which is composed of representatives of 10 local, state, and federal agencies (including natural resource agencies), and the CCWG Board of Directors and general membership.

Depending on the final locations of the monitoring stations, it is possible that access will be required on private lands. In these cases, private landowners will be contacted to determine their willingness to participate in the program. The CCWG, 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.

It is anticipated that an incidental take permit will be required to conduct any juvenile trapping activities due to the potential take of juvenile spring-run salmon during these efforts. The need for an incidental take permit will require NEPA/CEQA compliance, but this effort would require a low level of documentation because of the absence of ground-disturbing activities.

5. Performance Measures

The proposed project is, itself, a monitoring program. It will provide long-term monitoring of anadromous salmonid populations in various parts of the Cottonwood Creek basin and correlate the range and population of anadromous fish in the basin to the flow and temperature conditions present during the various life stages of the fish within the basin. These data 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.

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 web sites

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

The initial work plan documenting the selection of gage locations as well as the specifics of the proposed adult and juvenile salmonid survey protocols will be developed into a technical memorandum for review by the CCWG TAC. The final technical memorandum would serve as the governing document for protocols throughout the 3-year time frame. Results of each year's water and fish monitoring data will be compiled into a draft report to be reviewed by the CCWG TAC. This annual report would then be developed into a final report suitable for distribution outside of the CCWG TAC. Following completion of the third year's monitoring efforts, the three annual reports would be compiled into a summary report reviewing and interpreting the data collected in each of the 3 years.

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.

8. Work Schedule

The proposed project schedule is shown on Figure 1.

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 2001Ecosystem Restoration Program *Draft Stage 1 Implementation Plan* (CALFED, 2001). Goal 1, At Risk Species, notes the

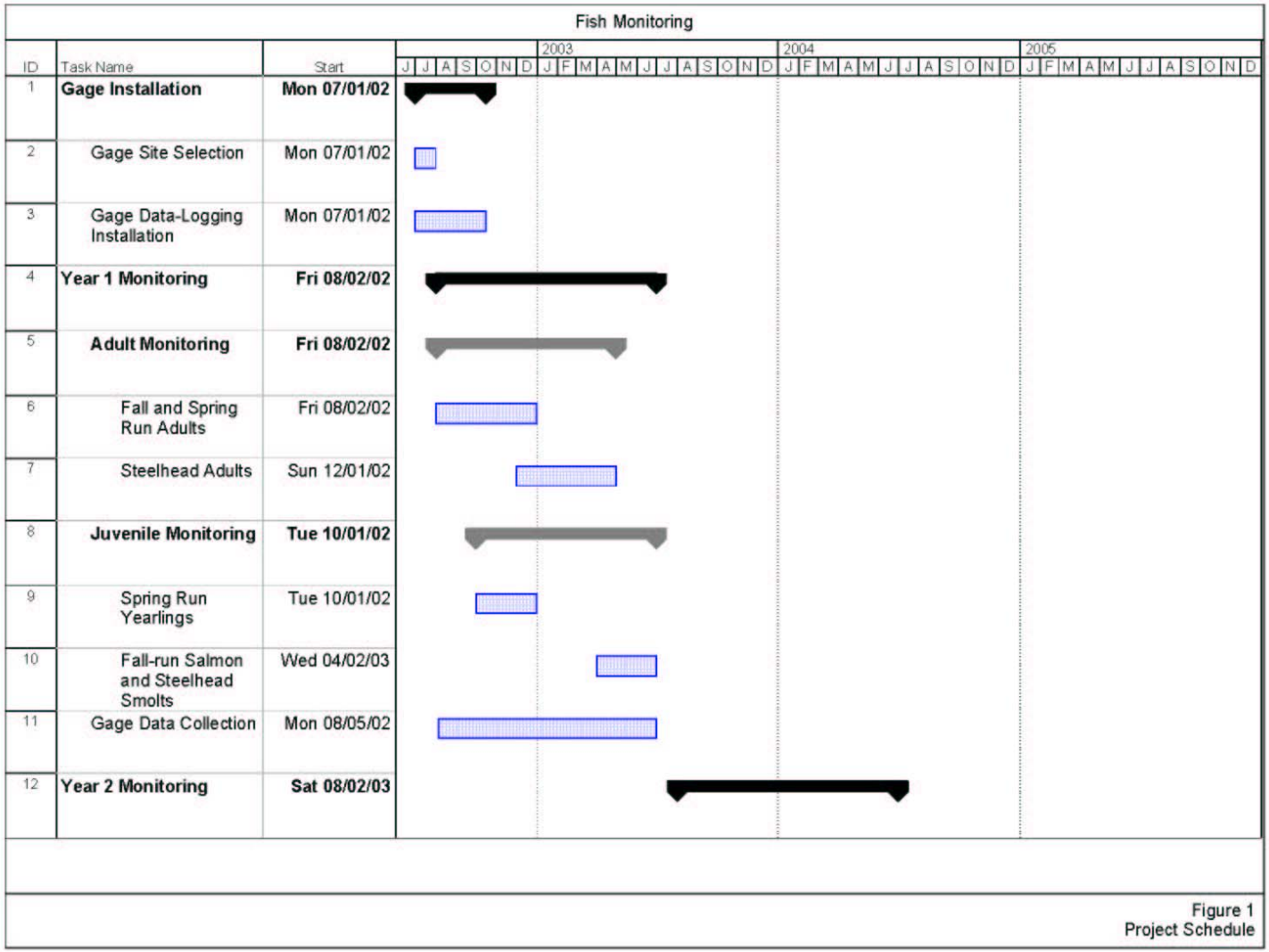

Figure 1
Project Schedule

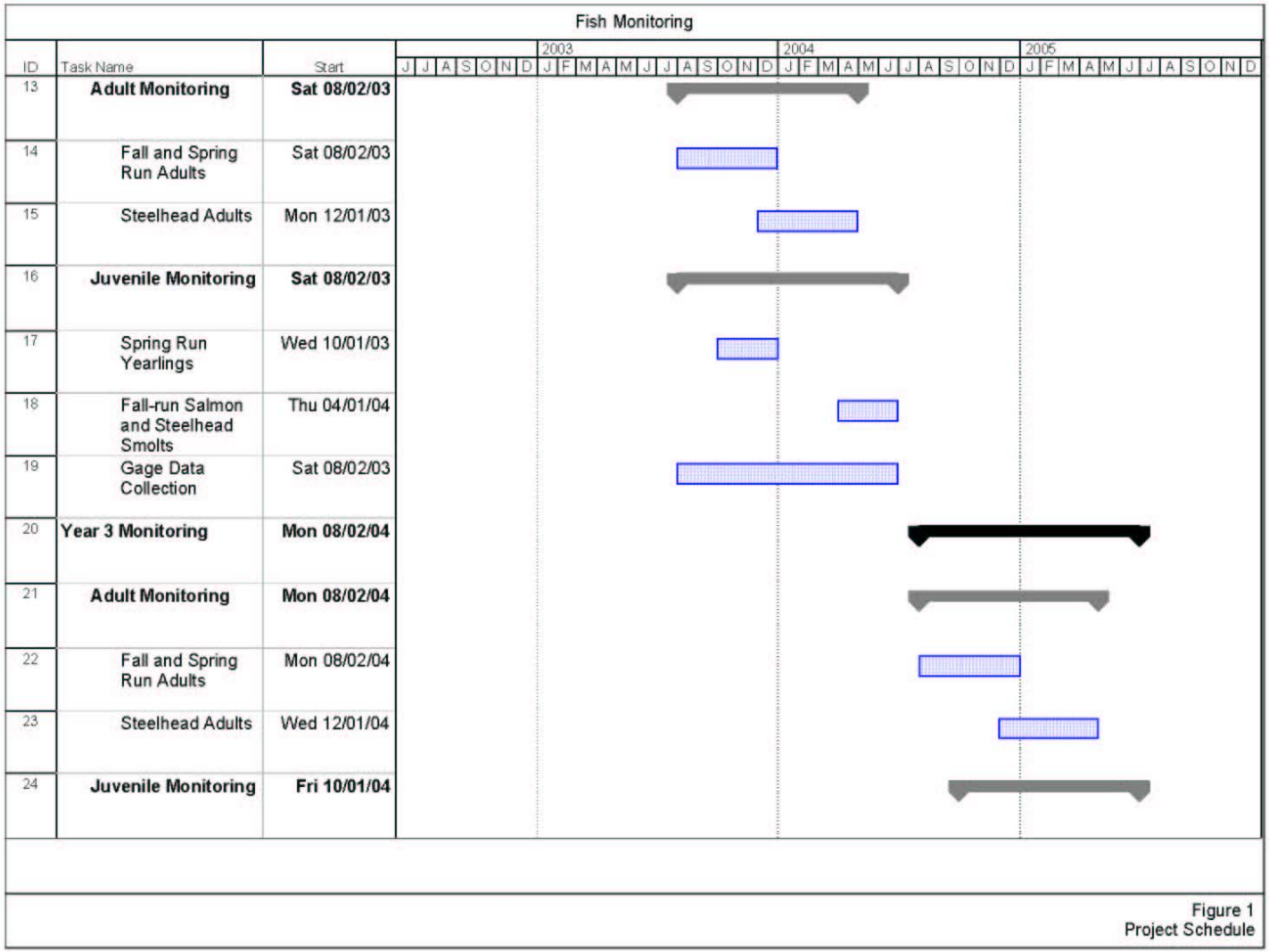

Figure 1
Project Schedule

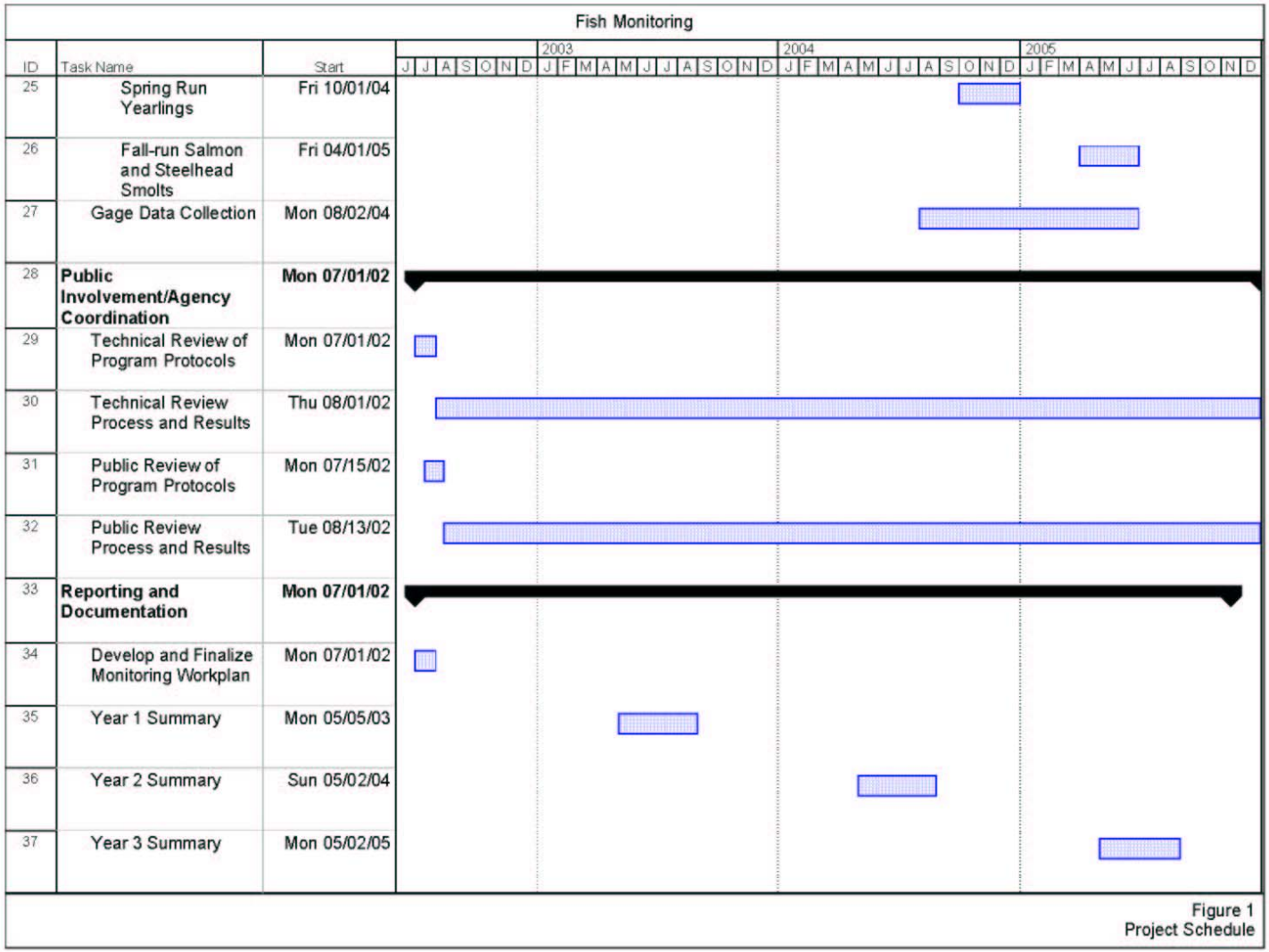

Figure 1
Project Schedule

Fish Monitoring

ID	Task Name	Start
38	Program Summary	Mon 07/18/05
39	**Project Management**	**Mon 07/01/02**
40	Project Instructions	Mon 07/01/02
41	Control and Reporting of Schedule/Budget	Mon 07/01/02

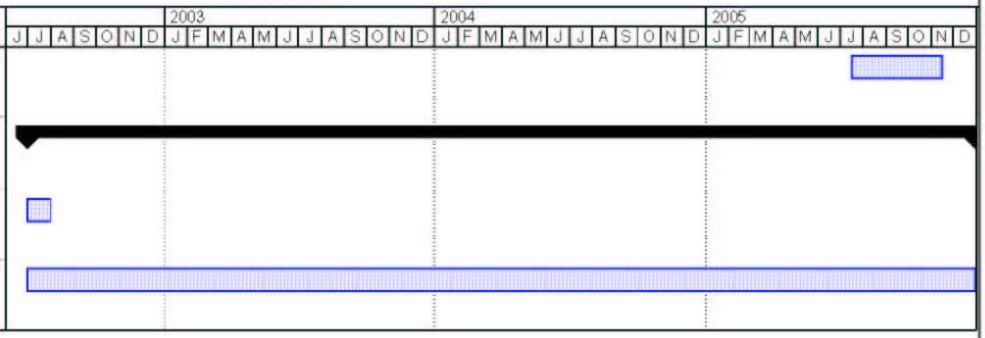

Figure 1
Project Schedule

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, annual fish population estimates, and fish species life histories and environmental requirements.

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.

Section 3406(b)(1) of the CVPIA specifically notes the goal of collecting fish population, health, and habitat data to facilitate evaluation of restoration actions. In sum, these goals provide a firm basis for implementation of an anadromous fisheries monitoring program in the Cottonwood Creek Basin.

Volume II of the February 1999 CALFED *Ecosystem Restoration Program Plan* (ERPP) (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.

2. Relationship to Other Ecosystem Restoration Projects

The resource agencies have been seeking better understanding of factors affecting fish populations in the Sacramento for over 100 years. 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 TAC, which includes representatives of USFWS, NMFS, CDFG, DWR, and Central Valley Regional Water Quality Control Board (CVRWQCB), will provide project input as part of their ongoing ecosystem restoration efforts through their respective agencies.

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. The project is proceeding on schedule and within budget.

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 in the Sacramento River and its tributaries, with mixed results. Improving the knowledge base of fisheries information will allow for better understanding of the success or limitations of these projects. This project is especially notable because it will build information on the presence of salmonids in an undammed tributary to the Sacramento River and correlate this information with the flow and temperature conditions present during the various life stages of the fish within the basin. This information will allow for valuable comparisons with other tributaries in the Valley that have both similar and different characteristics.

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, optimized 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.

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 are not anticipated; no significant ground disturbances or construction will occur. Overall effects of the project will be beneficial to the ecology of Cottonwood Creek, which will benefit all Californians. If selected gage locations are on private lands, the affected landowners will be contacted for permission to deploy the instruments on their properties. If permission is not forthcoming from a landowner, an alternate location will be selected.

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.

U.S. Fish and Wildlife Service. 2001. *Final Restoration Plan for the Anadromous Fish Restoration Program: A Plan to Increase Natural Production of Anadromous Fish in the Central Valley of California.* Stockton, California.