Project Information Form

Battle Creek Salmon and Steelhead Restoration Project

1. **Proposal Title:** Battle Creek Salmon and Steelhead Restoration Project

2. **Proposal Applicants:**

First Name	Last Name	Organization
Mary	Marshall	U.S. Bureau of Reclamation

3. **Corresponding Contact Person:**

First Name: Mary
Last Name: Marshall
Organization: U.S. Bureau of Reclamation
Address: 2800 Cottage Way, Sacramento, CA 95825
Phone: (916) 978-5248
Email: mmarshall@mp.usbr.gov

4. **Project Keywords:**

Fish Passage/Fish Screens
Fish, Anadromous
Habitat restoration, Instream

5. **Type of project:**

Restoration
Implementation: Full Scale

6. **Does the project involve land acquisition, either in fee or through a conservation easement?** There is no permanent land acquisition anticipated, however, there may be a need to compensate willing landowners for permanent and/or temporary construction easements on their properties.

No

7. **If yes, is there an existing <u>specific</u> restoration plan for this site?**

No

8. **Topic Area** *(check only one box)*

Fish Passage

9. **Type of applicant** *(check only one box)*

   Federal Agency

10. **Location - GIS coordinates**

Latitude:	40.435
Longitude:	-121.870
Datum:	NAD 83

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

This Battle Creek Salmon and Steelhead Restoration Project (Restoration Project) is located in the Battle Creek Watershed. Battle Creek, located northeast of Red Bluff, CA, is a tributary to the Sacramento River at Sacramento River Mile 271.5. The community of Manton lies between the two main forks of Battle Creek.

- **Location - Ecozone**
  4.4 Battle Creek

11. **Location - County** *(check all that apply)*

    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**

    CA 3rd District, Honorable Doug Ose

15. **Location - California State Senate District & California Assembly District:**
    California State Senate District Number: 4

    California Assembly District Number: 2

16. **How many years of funding are you requesting?** 3

17. **Requested Funds:**

Are your overhead rates different depending on whether funds are state or federal?

No

a. If no, list single overhead rate and total requested funds.

Single overhead rate (%): 130%

This overhead rate represents an average Reclamation overhead rate and includes operating expenses, corporate indirect expenses and fringe benefits. This rate is comparable to rates utilized by other agencies as well as private industry.

Total requested funds: $57.55 M to $64.05 M*

* Note: This range is presented due to cost differences between the mitigation options associated with the Mount Lassen Trout Farms pathogen issue, which are identified in the March Draft Supplemental Draft EIS/Revised EIS. These mitigation options will be further investigated and discussed, and the agreed upon mitigation will be identified in the Final EIS/EIR.

b. Do you have cost share partners already identified? Yes
If yes, list partners and amount contributed by each:

Partner	Amount Contributed
Pacific Gas & Electric Company (PG&E) And Third Party	Refer to comment below.

Comment:

Section 10 of the June 1999 Memorandum of Understanding by among National Marine Fisheries Service (NOAA Fisheries), U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, California Department of Fish and Game and Pacific Gas and Electric Company to Memorialize the Agreement Regarding the Proposed Battle Creek Chinook Salmon and Steelhead Restoration Project, Located in the Battle Creek Watershed in Tehama and Shasta Counties, California (MOU), discusses cost sharing for the Restoration Project. Table 3, of the January 1999 Agreement In Principle (Attachment to the MOU) illustrates the cost sharing specifics. As noted in this table, PG&E's total contribution is approximately 40% of the overall cost (or $20.55M in 1999). This includes costs for environmental (fisheries) monitoring, net present value of O&M impacts, cost of foregone power during construction and net present value of annual foregone power. In addition, a Third Party Donor (The Packard Foundation) is contributing $ 3M for an adaptive management fund.

c. Do you have potential cost share partners? Yes, the Iron Mountain Mine Council.

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

No

18. **Is this proposal for next-phase funding of an ongoing project funded by CALFED?** No, however this proposal is for supplemental funding to complete the Restoration Project listed below.
If yes, identify project number(s), title(s) and CALFED program (e.g., ERP, Watershed, WUE, Drinking Water).

Number	Title	Program
1999-B01	Battle Creek Salmon and Steelhead Restoration Project	ERP

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

Number	Title	Program
2002-BO2-DA	Battle Creek Interim Flow Agreement	EWP

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? Yes
If yes, identify project number(s), title(s) and CVPIA program.

Number	Title	Program
8-07-20-W1528	Battle Creek Interim Flow Agreement	Water Acquisition Program Section 3406b3
6-07-20-W1379	Battle Creek Interim Flow Agreement	Water Acquisition Program Section 3406b3

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

Battle Creek Salmon and Steelhead Restoration Project

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

       Yes

    2. Will this project require compliance with NEPA?

       Yes

    3. 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). Please write out all words in the agency title other than United States (use the abbreviation US) or California (use the abbreviation CA). If not applicable, put None.**

   CEQA Lead Agency: State Water Resources Control Board
   NEPA Lead Agency (or co-lead:) U.S. Bureau of Reclamation
   NEPA Co-Lead Agency (if applicable): N/A

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

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

   NEPA
   - Categorical Exclusion
   - Environmental Assessment/FONSI
   X 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.

3. **CEQA/NEPA Process**
    1. Is the CEQA/NEPA process complete?

No

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

   Draft EIS/EIR: July 2003

   Supplemental Draft EIS/EIR: February 2005

   CEQA Findings/Notices and NEPA ROD: August 2005

4. **Environmental Permitting and Approvals**

Successful applicants must tier their project's permitting from the CALFED Record of Decision and attachments providing programmatic guidance on complying with the state and federal endangered species acts, the Coastal Zone Management Act, and sections 404 and 401 of the Clean Water Act. The CALFED Program will provide assistance with project permitting through its newly established permit clearing house.

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

LOCAL PERMITS AND APPROVALS	Required?	Obtained?
Conditional use permit	-	-
Variance	-	-
Subdivision Map Act	-	-
Grading Permit	-	-
General Plan Amendment	-	-
Specific Plan Approval	-	-
Rezone	-	-
Williamson Act Contract Cancellation	-	-
Other	**X**	-

STATE PERMITS AND APPROVALS	Required?	Obtained?
Scientific Collecting Permit	-	-
CESA Compliance: 2081	-	-
CESA Compliance: NCCP	-	-
1601/03	**X**	-
CWA 401 certification	**X**	-
Coastal Development Permit	-	-

Reclamation Board Approval	-	-
Notification of DPC or BCDC	-	-
Other	**X**	-

FEDERAL PERMITS AND APPROVALS	Required?	Obtained?
ESA Compliance Section 7 Consultation	**X**	-
ESA Compliance Section 10 Permit	-	-
Rivers and Harbors Act	-	-
CWA 404	**X**	-
Other	**X**	-

PERMISSION TO ACCESS PROPERTY	Required?	Obtained?
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:	**X**	-

5. **Comments.** All applicable Shasta and Tehama County permits shall be obtained. These permits include County Encroachment Permits, Fugitive Emission/Dust Permits, and Hazardous Materials permits. In addition, the National Historic Preservation Act shall be complied with.

Land Use Checklist

Battle Creek Salmon and Steelhead Restoration Project

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?**

   Yes

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

5. **If you answered yes to #3, please answer the following questions:**

   a. **How many acres of land will be subject to a land use change under the proposal?**

   Approximately 100 acres of land may be impacted from construction impacts. Of the 100 acres, approximately 50% (or 50 acres) may be temporarily impacted and the other 50 % (or 50 acres) may be permanently impacted. Temporary impacts plan to be restored on-site, and permanent impacts plan to be mitigated through CALFED-approved conservation easements.

   b. Describe what changes will occur on the land involved in the proposal.

   Construction impact areas include the dam locations, canals and pipelines, access roads, staging areas and stockpile areas. Construction activities would temporarily affect grazing land, oak woodland and other habitats, and riparian and wetland areas

and would permanently affect the bed and bank of the stream, oak woodland and other habitats, and riparian and wetland areas. Removal of canals could return land use in those areas to grazing lands, terrestrial habitat and wetland and riparian areas (through the establishment of natural drainages).

c. **List current and proposed land use, zoning and general plan designations of the area subject to a land use change under the proposal.** NA

d.

Category	**Current**	**Proposed (if no change, specify "none")**
Land Use		
Zoning		
General Plan Designation		

e. **Is the land currently under a Williamson Act contract?**

No

f. **Is the land mapped as Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance under the California Department of Conservation's Farmland Mapping and Monitoring Program**

No

g. **Describe what entity or organization will manage the property and provide operations and maintenance services.**

Pacific Gas & Electric Company will manage the property and provide operation and maintenance services.

6. Comments.

It is not anticipated that any additional land will be required to implement the Restoration Project. Most of the facilities are on PG&E lands. PG&E currently holds various access rights from surrounding landowners and these are being researched as to their sufficiency for implementing the Restoration Project. Permanent easements may need to be acquired from willing private landowners and from the U.S. Bureau of Land Management to accommodate items, such at the burial of structural pipe. In addition, temporary easements for construction access may be needed. Discussions with landowners are ongoing. Problems are not anticipated in acquiring any necessary easements.

Conflict of Interest Checklist

Battle Creek Salmon and Steelhead Restoration Project

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

Mary Marshall, U.S. Bureau of Reclamation

Subcontractor

Are specific subcontractors identified in this proposal?

No

Helped with proposal development

Are there persons who helped with proposal development?

Yes

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

Name **Organization**

Refer to Comments

Comments

A review draft of this PSP was conveyed to the California Department of Fish and Game (DFG), Department of Water Resources (DWR), Pacific Gas and Electric Company (PG&E), National Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service (USFWS), the State Water Resources Control Board (State Water Board) and U.S. Bureau of Reclamation (Reclamation). Completion of this PSP was accomplished through incorporation of review comments and information provided by DFG, DWR, USFWS, PG&E and Reclamation. In addition, Ecosystem Restoration Program (ERP) staff performed a format check of the draft PSP.

Attachments A&B of this PSP, reviewed by Reclamation, DFG, USFWS, NOAA Fisheries, and the Battle Creek Watershed Conservancy were prepared by Terraqua, Inc.

Budget Summary

Battle Creek Salmon and Steelhead Restoration Project

A budget request summary table is located on the next page.

In addition, a cost comparison table is illustrated in the Budget Justification Form.

The breakdown of the $57.55 M to $64.05 M* budget request is as follows:

- $53.31M to $59.81 M* for Restoration Project Tasks.
- $ 1.5 M approved by the Ecosystem Restoration Amendments Committee to be taken out of the CALFED Project No. 1999-B01 Restoration Project ($ 28 M) funds for continuance of interim flows in Battle Creek (Battle Creek Interim Flow Agreement - CALFED Project No. 2002-B02-DA).
- $ 1.5 M of additional funds for continuance of interim instream flows into 2006 at Wildcat and Eagle Canyon Diversion Dams and into 2009 at Coleman Diversion Dam.
- $0.24 M for Development of a Coleman National Fish Hatchery Adaptive Management Plan (CNFH AMP), pursuant to the September 2003 Technical Review Panel Report and January 2004 CNFH Science Panel Report. (Attachment A of this Proposal).
- $1 M for CNFH AMP Diagnostic Studies, pursuant the September 2003 Technical Review Panel Report and January 2004 CNFH Science Panel Report. (Attachment B of this Proposal.

* Note: This range is presented due to cost differences between the mitigation options associated with the Mount Lassen Trout Farms pathogen issue, which are identified in the March Draft Supplemental Draft EIS/Revised EIS. These mitigation options will be further investigated and discussed, and the agreed upon mitigation will be identified in the Final EIS/EIR.

March 2005 Battle Creek Salmon and Steelhead Restoration Project Budget Summary

FEATURE	1999 CALFED Funding	Element Cost Update for each Feature of the Project							Cost Difference
		CONSTRUCTION CONTRACT COST	CONT'GY (20%)	FIELD COSTS	ENGINEER'G COSTS	PLANNING COSTS	CONSTRUCTION CONTRACT ADMIN	TOTAL BUDGET	
Coleman Dam									
Tailrace Connector - Inskip Powerhouse to Coleman Canal	$2,384,000	$1,076,200	$216,000	$1,291,200	$491,000	$168,000	$194,000	$2,144,200	$239,800
Dam Removal	$853,000	$214,200	$43,000	$257,200	$98,000	$33,000	$39,000	$427,200	$425,800
Inskip Powerhouse Bypass	$917,000	$5,270,500	$1,054,000	$6,324,500	$2,403,000	$822,000	$949,000	$10,498,500	-$9,581,500
Inskip Dam									
Fish Screen (220 cfs)	$1,375,000	$1,962,000	$392,000	$2,354,000	$895,000		$353,000	$3,602,000	-$2,227,000
Fish ladder	$963,000	$2,078,000	$416,000	$2,494,000	$948,000		$374,000	$3,816,000	-$2,853,000
South Powerhouse Bypass Tunnel & Tailrace Connector to Inskip Canal	$3,668,000	$6,884,200	$1,377,000	$8,261,200	$3,139,000	$1,074,000	$1,239,000	$13,713,200	-$10,045,200
South Dam									
Dam Removal	$3,026,000	$2,200,000	$440,000	$2,640,000	$1,003,000	$343,000	$396,000	$4,382,000	-$1,356,000
Wildcat Diversion Dam									
Dam Removal	$2,751,000	$2,300,000	$460,000	$2,760,000	$1,049,000	$359,000	$414,000	$4,582,000	-$1,831,000
Eagle Canyon Dam									
Fish Screen (70 cfs)	$1,007,000	$1,174,500	$235,000	$1,409,500	$536,000		$211,000	$2,156,500	-$1,149,500
Fish Ladder	$942,000	$2,242,200	$448,000	$2,690,200	$1,022,000		$404,000	$4,116,200	-$3,174,200
North Battle Creek Feeder Dam									
Fish Screen (55 cfs)	$535,400	$1,473,400	$295,000	$1,768,400	$672,000		$265,000	$2,705,400	-$2,170,000
Fish Ladder	$576,500	$982,300	$196,000	$1,178,300	$448,000		$177,000	$1,803,300	-$1,226,800
Access Road & Footbridge		$644,500	$129,000	$773,500	$294,000		$116,000	$1,183,500	-$1,183,500
Soap Creek Feeder									
Dam Removal	$183,000	$32,500	$7,000	$39,500	$15,000	$5,000	$6,000	$65,500	$117,500
Lower Ripley Creek Feeder Dam									
Dam Removal	$92,000	$14,700	$3,000	$17,700	$7,000	$2,000	$3,000	$29,700	$62,300
Asbury Pump Diversion	$0	$490,000	$98,000	$588,000	$223,000	$76,000	$88,000	$975,000	-$975,000
SUBTOTAL	**$19,272,900**	**$29,039,200**	**$5,808,000**	**$34,847,200**	**$13,243,000**	**$2,882,000**	**$5,228,000**	**$56,200,200**	**-$36,927,300**
Prescribed Instream Flow Releases	$0							$0	$0
Water Acquisition Fund	$3,000,000							$3,000,000	$0
Adaptive Management Fund	$0							$0	$0
Water Rights at Dam Removals Dedicated to the Environment in perpetutiy	$0							$0	$0
Anadromous Fish Monitoring	$1,000,000							$3,360,000	-$2,360,000
AMP, Evironmental Compliance Documentation	$2,020,000							$5,754,500	-$3,734,500
Cost of Forgone Power During Construction	$54,400							$54,400	$0
Construction Environmental Mitigation	$570,000							$5,051,150	-$4,481,150
Construction Real Estate Compensation	$0							$300,000	-$300,000
Net Present Value of Annual Forgone Power	$2,082,700							$2,082,700	$0
Net Present Value of O&M Impacts	$0							$0	$0
MLTF(Pipeline and 'Buy-out' Agreement Mitigation) -1	$0							$5,500,000	-$5,500,000
MLTF (Pipeline and Disinfection Mitigation) -2	$0							$12,000,000	-$12,000,000
Total Project Cost -1	**$28,000,000**							**$81,302,950**	**-$53,302,950**
Total Project Cost -2	**$28,000,000**							**$87,802,950**	**($59,802,950)**
RELATED PROJECT COST	$0								
Interim Flows	$0							$3,000,000	-$3,000,000
CNFH-AMP Development	$0							$240,000	-$240,000
CHFH-AMP Diagnostic Studies	$0							$1,000,000	-$1,000,000
Related Project Total	$0							**$4,240,000**	**-$4,240,000**
TOTAL COST -1								**$85,542,950**	**-$57,542,950**
TOTAL COST -2								**$92,042,950**	**-$64,042,950**

Notes:

1. Construction Contract Cost + Contigency Cost = Field Cost
2. Field Cost +Engineering Cost + Planning Cost + Construciton Contact Administration Cost = Total Budget Cost
3. Total Cost -1 represents the total cost utilizing the lower cost MLTF mitigation. (Asbury costs are in development and will need to be added.)
   Total Cost -2 represents the total cost utilizing the higher cost MLTF mitigation. (Asbury costs are in development and will need to be added.)
   MLTF mitigation options are being presented in the Draft SEIS/REIR and will be further investigated. Agreed upon MLTF mitigation will be captured in the Final EIS/EIR.

Budget Justification

Battle Creek Salmon and Steelhead Restoration Project

Budget Justification Overview

In general, the need for supplemental funding is due to the following factors:

1. **Provisions within the MOU, and the conservative design philosophies established pursuant to the MOU provisions.**
2. **A more detailed understanding of site conditions.**
3. **Development of environmental compliance documentation and project designs.**
4. **CALFED independent technical review panels findings and recommendations.**
5. **Increase in construction material costs.**

1. Provisions within the MOU, and the conservative design philosophies established pursuant to the MOU provisions.

Estimated costs for the proposed Restoration Project were developed through a series of appraisal/reconnaissance level studies completed between 1998 and early 1999. In February 1999, CALFED conditionally approved funding for the Restoration Project contingent upon the development of a formal Memorandum of Understanding (MOU) between Pacific Gas and Electric Company (PG&E) and the Resource Agencies. A formal MOU between PG&E, the U.S. Bureau of Reclamation (Reclamation), the California Department of Fish Game (DFG), the U.S Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) was established in June 1999, and funding was then approved based on the appraisal/ reconnaissance level studies and cost estimates developed in 1998 and 1999. A traditional process involving feasibility design phases was therefore not completed prior to the funding approval in June 1999.

Cost increases are attributable in part to the fact that design efforts went directly from the appraisal/reconnaissance level to final design. During the final design concept phases, much time and effort were expended to develop and evaluate design alternatives that normally would have been developed and evaluated during feasibility phases associated with a traditional planning process. PG&E, DFG, NOAA Fisheries and USFWS participated in a collaborative effort with Reclamation and the California Department of Water Resources (DWR) to identify numerous design alternatives. Each design alternative was examined and evaluated until a consensus was reached.

Through the negotiation process, the MOU included provisions for screen and ladder facilities to be designed as "failsafe." A "Fail-Safe Fish Ladder" is defined in Section 2.10 of the MOU, as, "features inherent in the design of the ladder that ensure the structure will continue to operate to facilitate the safe passage if fish under the same performance criteria as designed under anticipated sources of failure." A "Fail-Safe Fish Screen" is defined in Section 2.11 of the MOU as, "a fish screen that is designed to automatically shut off the water diversion whenever the fish screen fails to meet design or performance criteria until the

fish screen is functional again." Additionally, a 'Three-Point Philosophy evolved through coordination with the MOU signatories. The three points for ensuring the highest probability for success of the Restoration Project are: 1) facilities need to be designed to have a high probability of successfully meeting biological goals; 2) facilities need to be designed to have a long-term functional reliability; and 3) facilities need to be designed for ease of operation and maintenance. In addition to the screens and ladders, this 3-point design philosophy has been applied to other Restoration Project features. ***Application of the failsafe provisions within the MOU and the 'Three Point Philosophy' has increased project costs.***

2. A more detailed understanding of site conditions.

As the project progressed, a more detailed understanding of the site conditions revealed that more effort was required than earlier anticipated to collect the necessary environmental and design data to appropriately evaluate design alternatives and develop environmental compliance documentation and design plans/specifications. Key items contributing to project cost increases follow:

- Need for investigations to assess the potential IHN pathogen issue at Mount Lassen Trout Farm hatcheries.

- Need for additional and extensive environmental surveys, including habitat, wildlife, botanical, wetland and tree surveys in order to consider the environmental impacts of all design alternatives being considered.

- Increase in site visits to collect engineering/design field data for all design alternatives being considered. Field data that is needed includes:

    - the location of potential access routes to project sites;
    - the condition of existing of access roads and assessment of the need to improve existing access roads for construction vehicle usage,
    - the need for and location of new potential access roads;
    - the location of power sources;
    - location of areas that could present potential safety issues, and
    - location of staging and stockpile areas.

- Increase in geologic data collection efforts to address all design alternatives being considered; examples follow:

    - Need for drill rigs to be flown by helicopter to the exploratory drill hole locations at the South Powerhouse Bypass Tunnel location, because there is no road access.
    - Need to assess different Inskip and North Battle Creek Feeder Diversion Dam access road alternatives in order to construct and maintain the fish screen and fish ladder.
    - Need for detailed geologic investigations at the Eagle Canyon and Wildcat Diversion Dam sites to assess the rock fall potential, and therefore the potential safety hazards that could occur during construction at these sites.

- Need for geologic investigations to be performed for each bypass alignment alternative, as well as at each existing water conveyance features planned to be removed.

3. Development of environmental compliance documentation and project designs.

A better understanding of the site conditions, the collection of additional site data, and related project actions and processes have increased the cost to develop environmental documentation and project designs. Key items contributing to cost increases include:

- Analysis of information obtained from extensive, detailed environmental surveys, and incorporation of the analyzed information into the environmental compliance documents.

- Analysis of design/engineering and geologic data collected and the incorporation of the analyzed data into project designs.

- Increase in the number of Environmental Team, Adaptive Management Team, Design Team and Project Management Team meetings, as well as an increase in coordination efforts between the teams.

- Need for additional design and environmental reviews.

- An increase in the production and distribution of draft environmental documents, and an increase in the number of public workshops to discuss the information contained within the environmental compliance documents.

- As a result of reintroducing salmonids into the watershed and the potential effects on Mt Lassen Trout Farm and Darrah Springs State fish hatcheries, analysis of information obtained regarding the potential for increased risk of a serious or catastrophic fish disease spreading from Battle Creek to fish communities throughout the state through stocking with Mt Lassen Trout Farm and Darrah Springs State fish, and incorporation of the analyzed information into the environmental documents and project designs.

- The need for a more detailed analysis of Coleman National Fish Hatchery related project actions, and other issues that have been raised by the Battle Creek Working Group and the Battle Creek Watershed Conservancy, and incorporation of the analyzed information into environmental documents.

- The need to develop an Action Specific Implementation Plan (ASIP) pursuant to CALFED requirements.

4. CALFED independent technical review panels findings and recommendations:

Due to an additional funding estimate of $34 million in August 2003, the California Bay-Delta Authority (CBDA) called for an independent technical panel (Panel) review of the Restoration Project. The Panel examined the work completed to date, information presented by the cooperating agencies, and additional materials requested by Panel members. The goal of the review was to provide a comprehensive evaluation of the technical merit of the Battle Creek Restoration Project and to strengthen the effort to restore salmon and steelhead in

Battle Creek. The Panel completed a Technical Review Panel (TRP) Report in September 2003. The Restoration Project Management and Adaptive Management Teams prepared a January 2004 Initial Response, as well as a May 2004 Final Response to the TRP Report. Compatibility of Coleman National Fish Hatchery (CNFH) operations with Battle Creek watershed restoration is a major concern of stakeholders engaged in planning and implementing restoration activities in the Battle Creek watershed. The CALFED Science Program formed an independent Science Panel to address these and other technical questions from a science perspective. In January 2004, a CHFH Science Report was issued, followed by a Science Report Workshop in February 2004.

Based on the Ecosystem Restoration Program (ERP) Selection Panel Recommendation, issues identified by the Science Panel have been addressed in the Restoration Project Adaptive Management Plan (AMP) and the Action Specific Implementation Plan (ASIP), and Restoration Project designs will be modified, as described in the Initial and Final Response to the September 2003 Technical Review Panel Report. In addition, to facilitate the coordination of hatchery efforts and habitat restoration efforts, Attachments A and B of this PSP contain related action proposals to develop a CNFH Adaptive Management Plan (CNFH-AMP) and perform diagnostics studies associated with the CNFH-AMP, ***Key items related to project and related project costs, as the result of the independent technical reviews follow:***

- Environmental mitigation costs decreased significantly from August 2003 estimate ($4M to approximately $2M) due to the Restoration Project Environmental Team making the biological determination that habitat types on CALFED-funded conservation easements would provide suitable mitigation credit for the predicted Restoration Project impacts to those habitat types.
- Screen and ladder improvements identified by the TRP, and agreed upon by Restoration Project Screen and Ladder Technical Team will be incorporated. The design changes increased the overall screen and ladder costs by approximately $150,000 (or by about $50,000 at each screen and ladder location).
- Based the TRP comment that $1M funds for adaptive management anadromous fish monitoring is insufficient, the Restoration Project Adaptive Management Team evaluated the probable amount of fish monitoring needed, and increased the funding for this monitoring to $3.36M. (The estimate is for a three-year period per CALFED advice on the periodic need for peer/technical review of the science).
- Based on numerous TRP comments on the Draft AMP, the Draft AMP has been substantially revised. The revisions involved numerous Adaptive Management Team coordination efforts and assistance from the CALFED Science Program. In addition, the developing revised Draft AMP was discussed in detail at a March 2004 Battle Creek Working Group Meeting, and comments from interested parties were received on the draft at the end of March, prior to its completion in April 2004.
- Cost associated with Attachments A and B of this Proposal; development of a CNFH Adaptive Management Plan (CNFH-AMP) and performance of diagnostics studies associated with the CNFH-AMP.
- Based on a TRP comment that consideration need be given to a project alternative with more complete decommissioning, an eight dam removal scenario was explored and compared to the Restoration Project Proposed Action (five dam removal alternative). A Public Workshop was held on March 15, 2004 to discuss information regarding the

economics (replacement power costs), habitat benefits and process/schedule impacts of an eight dam removal scenario verses the Proposed Action. Subsequently, an April 2004 Report entitled, 'Further Biological Analyses for Information Presented at the Public Meeting Held in Red Bluff, California, on March 15, 2004, Regarding the Differences between the Five Dam Removal Alternative and the Eight Dam Removal Alternative' was developed. As disclosed in the February 2005 Draft Supplemental EIS/Revised EIR, an eight dam removal scenario will not pursued further as a project alternative, due to the following:

- Incremental habitat benefits of the Eight Dam Removal Alternative would be only marginally better compared to the Five Dam Removal Alternative.
- The cost of replacement energy for the Eight Dam Removal Alternative would be excessive.
- The Five Dam Removal Alternative better achieves a key project objective of minimizing the loss of clean and renewable energy produced by the Battle Creek Hydroelectric Project.
- The Eight Dam Removal Alternative lacks support of a willing participant, as required by the CALFED Program objectives.

5. Increase in construction material costs.

There has been an increase in construction building material costs (such as, steel and cement) since May 2004, resulting in an approximate 10 - 20 % increase in construction costs.

The following table illustrates a cost comparison between June 1999 and March 2005 (A further breakdown of cost elements is illustrated on the Budget Summary Form).

FEATURE	1999 CALFED Funding Allocation	Estimate (August 2003)	Estimate (May 2004)	Estimate (March 2005)	Cost Difference (1999 - 2005)
RESTORATION PROJECT PROPOSED ACTION					
1- Inskip Powerhouse Tailrace Connector	$2,384,000	$3,128,000	$1,847,000	$ 2,144,200	$ 239,800
1- Coleman Dam Removal	$ 853,000	$ 853,000	$367,500	$ 427,200	$ 425,800
1- Inskip Powerhouse Bypass	$ 917,000	$5,180,000	$9,043,000	$10, 498,500	-$9,581,500
2- Inskip Dam Fish Screen	$1,375,000	$2,440,000	$3,127,000	$ 3,602,000	-$2,227,000
2- Inskip Dam Fish Ladder	$ 963,000	$6,977,000	$3,310,000	$ 3,816,000	-$2,853,000
2- South Powerhouse Bypass Tunnel and Tailrace Connector and Access Road to Inskip Dam	$3,668,000	$9,164,000	$11,812,000	$13,713,200	-$10,045,200
3- South Diversion Dam Removal	$3,026,000	$3,984,000	$3,984,000	$4,382,000	-$1,356,000
4 -Wildcat Dam Removal	$2,751,000	$3,818,000	$3,818,000	$4,582,000	-$1,831,000
5- Eagle Canyon Fish Screen	$1,007,000	$1,894,000	$2,030,000	$2,156,500	-$1,149,500
5- Eagle Canyon Fish Ladder	$ 942,000	$3,767,000	$3,880,000	$4,116,200	-$3,174,200
6- North Battle Creek Feeder Fish Screen	$ 535,400	$1,090,000	$1,126,000	$2,705,400	-$ 2,170,000
6- North Battle Creek Feeder Fish Ladder	$ 576,500	$2,754,000	$2,980,000	$1,803,00	-$1,226,800

FEATURE	1999 CALFED Funding Allocation	Estimate (August 2003)	Estimate (May 2004)	Estimate (March 2005)	Cost Difference (1999 - 2005)
6- North Battle Creek Feeder Access Road & Foot bridge	$0	$ 899,000	$899,000	$ 1,183,500	-$ 1,183,500
7- Soap Creek Feeder Dam Removal	$ 183,000	$269,000	$ 60,000	$ 65,500	$ 117,500
8- Lower Ripley Creek Dam Removal	$ 92,000	$62,000	$ 25,700	$ 29,700	$ 62,300
9- Asbury Pump Diversion	$0	$0	$20,000	$ 975,000	$ 975,000
10- Prescribed Instream Flow Releases	$0	$0	$0	$0	$0
10- Water Acquisition Fund	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$0
12- Adaptive Management Plan (AMP)	Included with Item 16	Included with Item 16	Included with Item 16	Included with Item 16	Included with Item 16
13- Adaptive Management Fund	To be provided by PG&E, as necessary.	To be provided by PG&E, as necessary.	To be provided by PG&E, as necessary.	To be provided by PG&E, as necessary.	To be provided by PG&E, as necessary.
14- Water Rights at Dam Removals Dedicated to the Environment	$0	$0	$0	$0	$0
15-Anadromous Fish Monitoring	$1,000,000	$1,000,000	$3,360,000	$3,360,000	-$2,360,200
16- AMP, Environmental Compliance Documentation	$2,020,000	$3,254,700	$4,419,500	$5,754,500	-$3,734,500
17- Cost of Forgone Power During Construction	$ 54,400	$ 54,400	$ 54,400	$ 54,400	$0
18- Construction Environmental Mitigation	$ 570,000	$4,000,000	$2,030,000	$5,051,150	-$4,481,150
19- Construction Real Estate Compensation	$0	$0	$300,000	$300,000	-$300,000
20- Net Present Value of Annual Forgone Power	$2,082,700	$2,082,700	$2,082,700	$2,082,700	$0
21- Net Present Value of O&M Impacts	$0	$0	$0	$0	$0
22- MLTF Pathogen Issue	$0	$2,329,200	$5,500,000	$5,500,000 to $12,000,000	-$5,500,000 to $-12,000,000
TOTAL: Restoration Project Features	$28,000,000	$62,000,000	$69,076,000	$81,302,950 to $87,802,950	-$53,302,950 to -$58,802,950
RELATED RESTORATION RELATED PROJECT ACTIONS					
1- Interim Flows	($1,500,000 from 1999 funding via April 2004 amendment)	$0	$1,500,000	$ 3,000,000	-$3,000,000
2- CNFH Development of AMP	$0	$0	$240,000	$240,000	-$240,000
3- CNFH AMP Diagnostic Studies	$0	$0	$1,000,000	$1,000,000	-$1,000,000
TOTAL: Restoration Project Related Actions	($1,500,000 from 1999 Funding via April 2004 amendment)	$0	$2,740,000	$4,240,000	$-4,240,000
TOTAL: Restoration Project Features + Related Restoration Project Actions	$28,000,000	$62,000,000	$71,816,000	$85,542,950 to $92,042,950	-$57,542,950 to -$64,042,950

Budget Justification for each Restoration Project Feature

General Note: There has been an increase in construction building material (such as, concrete and steel) costs since May 2004, resulting in an approximate 10 - 20 % increase in construction costs.

1. Coleman Diversion Dam and Inskip Powerhouse Tailrace Connector

The estimated costs for the Inskip Powerhouse tailrace connector and Coleman Dam removal have decreased from 1999 due to a better understanding of the features and site conditions.

1 Inskip Powerhouse Bypass

1. At the time of the original 1999 Restoration Project proposal, the nature of this proposed facility was in question because of the complexity of the facility. Eleven different alternative means of achieving the goals of the powerhouse bypass facility were evaluated. Complex engineering questions arose in the design of this structure. Extensive conceptual design effort went into determining the most feasible means of providing bypass capabilities while meeting biological and reliability goals. Significant hydraulic challenges arose in the design of this feature.
2. Original concept was to develop relatively inexpensive "natural channel" drainage similar to the existing bypass system along a relatively erosion resistant alignment. Geologic investigations determined that proposed alignments were not erosion resistant thereby making any inexpensive solution infeasible. Led to the selection of a pipeline and chute alternative.
3. Slopes on upper plateau where bypass pipeline alignment was identified are steeper than appear. Hydraulically, velocities of water flowing in the bypass pipe reach on the order of 50 feet per second even before dropping down into the river canyon. Required the development of an energy dissipator on top of the plateau prior to sending the water over the edge of the upper plateau down to the river terrace. Chute conveying bypassed flows down to the river terrace develops velocities approaching 70 feet per second. Requires substantial energy dissipator at the bottom of the slope.
4. Chute bringing bypass flows down into the South Fork Canyon must cross Mt. Lassen Trout Farms water supply line. This water supply line cannot be taken out of service so construction of a bypass for this water supply line must be done without interruption to water supply. This was not included in the reconnaissance/appraisal level design.

2. South Powerhouse Bypass Tunnel, Tailrace Connector and Road to Inskip Dam

1. Bypass tunnel alignment was shifted slightly to accommodate geologic conditions. This slightly lengthened the tunnel compared to the reconnaissance design estimate.
2. Length of box culvert at peninsula doubled when all features required at peninsula for tailrace connector were considered.
3. Estimated slide gate costs for tunnel inlet portal increased.
4. Need for additional canal wasteway at tunnel outlet portal identified and included in design. Need was identified based on closer examination of tunnel and canal diversion operations. Examinations of operations of the tunnel and canal diversion during outages identified possibility for surcharging canal, thereby requiring a new wasteway to prevent uncontrolled overtopping of the canal embankment.

5. Bringing the new road alignment across peninsula required examination of the elevations of the peninsula and the frequency at which floodwaters could potentially overtop peninsula road and prevent access during critical flood periods. Established design criteria that road should be established at 100-year flood elevation. Requires rising of the height of the peninsula.
6. Original designs for South Powerhouse tailrace channel were based on a riprap slope protection concept and precast concrete block retaining wall with earthfill embankment. Raised elevation of peninsula for 100-year flood protection and closer examination of hydraulic loading conditions and seepage potential required design change (using roller-compacted concrete) to ensure structure stability, at increased cost. Pursuant to the September 2003 Technical Review Panel report, new studies are currently underway for a precast concrete panel wall and precast concrete block spillway to reduce construction costs and to minimize the construction time.
7. Determined need to include sediment trap in front of tunnel inlet portal and an operation and maintenance access ramp to inlet portal/sediment trap area.
8. During the reconnaissance phase the Access Road to Inskip Dam was estimated to be 12 feet wide, 2000 feet in length and include a 40-foot long railway flatcar bridge. During final design examination of topography at the Union Canal wasteway and the hydraulics of the flow in this wasteway it was determined that the railway car configuration would not work because it was too short to safely provide passage for wasteway flows and debris beneath the bridge. Four alternative road concept alignments were examined. Concept alignment alternative 3 was ultimately selected. Three variations of the Alternative 3 concept were considered to assess ways to minimize visual and environmental impacts. Due to safety concerns associated with construction traffic to construct the screen and ladder at Inskip Dam, it was decided to increase the road width from 12 feet to16 feet in width, plus an additional 4 feet of width to accommodate drainage ditch and guardrail. Pursuant to the September 2003 Technical Review Panel Report, the need for the increase in road width was reconsidered, and it was determined that a 12 foot wide road with a few wider turn-out areas would properly address safety concerns and reduce environmental impact, costs and visual impact. Rock-aging compounds, to be applied to newly exposed road cuts will also reduce visual impacts.
9. A portion of the existing access road to South Powerhouse is in front of a landowner's home. In order to avoid heavy construction traffic in front of the landowner's home, other access options, including the development of a new road or improvement of an existing road have been investigated

2. Inskip Diversion Dam Fish Screen and Ladder: Civil Features

1. Design Flow - The reconnaissance /appraisal level design used as the basis for the original 1999 CALFED funding had a ladder design capacity of up to 80 cfs. Design flow criteria is now based on not allowing more than a three day delay, on average, with a 1:10 year frequency. This resulted in a design flow of 1,700 cfs which translates to a ladder flow design capacity of 170 cfs (including auxiliary water supply). Consideration was given to a design flow of 1000 cfs (100 cfs ladder design flow including auxiliary water supply, i.e. more in line with original design flow). A design flow of 1000 cfs would allow 3-day delays to occur, on average with a 1:3.1 year frequency and a 6-day delay to occur, on average, with a 1:9.3 year frequency. Average daily flows greater than 1700 cfs have occurred 51 times in the 36 year period of record for an average 1.4 days per year (yielding 0.39% exceedance). Average daily flows greater than 1000 cfs have occurred 181 times in the 36 year period of record for an average of 5 days per year (yielding 1.39% exceedance). Given this analysis,

the fish screen and ladder design team (including all fishery resource agencies) decided that it was still appropriate to maintain the three-day delay criteria with a 1:10 year frequency (1700 cfs design flow).

2. Fish ladder bridge - A concrete cover over the upper end of the ladder was added to serve as a bridge for vehicle access to the top of the entrance chamber and other areas south of the fish screen. The bridge is 16 feet wide and the clearance between the high weir and the underside of the bridge is 2.5 feet.

3. Upper and lower access roads - A short upper access road, from the fish ladder bridge to the area north of the entrance chamber, was added for maintenance. Where the road crosses the sluiceway, sliding wall panels will be opened to provide vehicles access over the sluiceway floor. A short, unpaved road was also added south of the ladder, between the ladder and the stream, for maintenance access to the entrance chamber.

4. Fish Screen Bypass Channel - The fish screen bypass channel was changed to a 4-foot wide, rectangular concrete channel rather than using the existing canal profile. The addition of the upper access road, and associated grading changes in the area south of the bypass channel, dictated this change.

5. Ladder Structure Drainage - Surface and subsurface drainage within the "C" shaped Fish Ladder Structure, between the bypass channel, the parallel portion of the fish screen and the fish ladder entrance, was changed/added as a result of adding the upper access road (Item 3). Collection ditches were added to collect and direct surface flow. Perforated drainage piping running alongside the bottom exterior of the ladder was added to collect subsurface water and direct it into the creek.

6. Railcar Bridge - A bridge across the canal will be located just downstream of the tilting weir structure, to provide vehicle access to the fish ladder and the entrance chamber, for maintenance.

7. Parking lot - A paved parking lot was added at the north side of the new facilities, at the terminus of the main access road. The east end of the parking lot was extended to allow access to the instrumentation and the intermediate control structure. The parking lot is still 120± feet from the headwork's but a large mobile crane may be able to reach valves and equipment at the headwork.

8. Radial gates - A plate was added to the top of each radial gate to prevent fish from falling back over the gate when water is spilling during maximum flow. The steel plate assemblies are oriented vertically and are anchored to the sides of the structures; they are not connected to the gates. A rubber seal is used to block the gap between the gate and the plate while allowing normal gate travel.

9. Fish monitoring - The fish monitoring station was moved from the south to the north side of the canal, adjacent to the tilting weir structure. Conduit and hardware will be installed for mounting and connecting cameras and lights. A slot at the opening of the recess will enable clear plexiglass panels to be removed for cleaning without dewatering. A white plexiglass panel mounted on the opposite sidewall will serve as background for the cameras. The cameras and lights were to be purchased and installed separately later, near the end of construction, to take advantage of any technological advances in the equipment but that has recently changed. The cameras and lights will be included in the construction contract. Automated fish counters are not included; they may be installed later if deemed necessary.

10. Ladder sluiceway and drain pipe - Sluice water will be discharged into a 27-inch drainage pipe terminating approximately 70 feet away from the ladder, near South Fork Battle Creek. The pipe will now be able to convey the full ladder flow of 39 cfs so that the flow can be diverted around the entrance chamber for periodic maintenance. The weir

downstream of the ladder sluiceway will be revised to accommodate flashboards for situations when flow must be diverted.
11. Stream Channel Excavation - The excavation across from the entrance chamber, on the south side of the creek, was eliminated. The excavation may be done in the future, if access to the south side is obtained and if hydraulic problems arise that require the excavation.
12. Auxiliary water pipe size - The size of this pipe was increased from 36 to 42 inches to be able to reduce velocity at the diffuser and also to extend the service life of the cement mortar-lined pipe.
13. Auxiliary water pipe flow control – The control gate was located at the entrance during preliminary design; however, the pipe does not flow full and under certain conditions a hydraulic jump will occur. The control gate was moved to the pipe outlet, to ensure the pipe always flows full, eliminating the hydraulic jump.
14. Auxiliary water pipe diffuser - Although the size estimated during preliminary design satisfies published fishery guidelines, at DFG's request, the diffuser size was increased, dissipator "blocks" were added, and the floor was tapered to reduce water velocity through the grating and to make it as uniform as possible. At DFG's request, a steel "false wall" was also added in front of the slide gate, to provide a flush surface for the fish.
15. Entrance chamber - The acute angle at the entrance chamber, near the downstream opening, was eliminated. A transverse wall was added near the downstream opening and the triangular void will now be filled with mass concrete. The change, made to eliminate debris accumulating at the corner, also required modifications to the service platform and relocating an access ladder.
16. Entrance chamber - A chamfer was added at the southeast corner of the entrance chamber, to minimize flow turbulence. The change required modifications to the service platform and relocating an access ladder.
17. Diversion canal - The invert surface of the transition canal, between the sediment basin and the top of the fish ladder, was raised by one foot, to limit the maximum allowable head loss at the headworks gate structure to 1 foot during high flow conditions (a fishery requirement). Other changes required by the slight increase in water surface elevation:
18. Ladder pools - Another pool was added at the top of the fish ladder, to provide the necessary incremental drop in water surface elevation along the length of the ladder. The lower weir of this new pool will include flashboards, to provide operational flexibility.
19. Screen panels - One more section of fish screen (2 stacked panels) was added, to maintain the minimum required wetted area in spite of the reduced water depth. Also, as screen details evolved, the base of the screen begins 4"± above the invert, higher than estimated during preliminary design.

2. Inskip Diversion Dam Fish Screen and Ladder: Mechanical Features

20. Hoist – a 1/2 Ton manual hoist was added to install and remove the fish screens. The hoist will convey the screens to a lay down area at the south edge of the parking lot.
21. Swing gate - Swing gate (a custom item) was changed to a slide gate to reduce fabrication costs. This is currently being changed back to a swing gate, pursuant to improvements suggested in the September 2003 Technical Review Panel Report.
22. Hydraulic lubricant – changed from food grade oil to biodegradable oil, required research and numerous discussions with participants to resolve.
23. Ladder entrance gate operators – changed from manual to automatic hydraulic operation so gates could be automated based on the water level measured at several locations.
24. Flow control louvers – the louver configuration was changed from vertical to inclined at 30 degrees, parallel to the fish screen panels, to provide better flow control.

25. Auxiliary water control gate – pipe size changed from 36" to 42" and pipe was moved to the entrance chamber, as noted in Civil notes above.

2. Inskip Diversion Dam Fish Screen and Ladder: Electrical Features

26. System operation logic - System operation logic was developed to meet operational criteria acceptable to PG&E, DFG, NOAA Fisheries and USFWS. Seven stage sensors will monitor water levels in the fish ladder and fish screen to ensure minimum instream flow requirements are met and ensure proper operation of the fish passage facility.
27. Monitoring equipment - A cabinet was added to house the fish monitoring equipment.

3. South Diversion Dam Removal

Cost increased due to refinements during final design concept phases, primarily related to access difficulty, and the removal of mechanical and miscellaneous metalwork items at the dam and concrete transition structures along the canal.

4. Wildcat Dam Removal

Cost increased due to refinements during final design concept phases, primarily related to access difficulty, and the removal of additional pipeline supports and portions of the dam.

5. Eagle Canyon Screen and Ladder: Civil Features

1. Fish ladder design flow capacity – Original reconnaissance design identified the design flow in the ladder to be 50 cfs. Final design analysis identified the design flow to be 60 cfs.
2. Fish monitoring – fish monitoring was not clearly defined in the Preliminary Design Technical Report (PTR). As a result, extra design work was required to prepare fish monitoring proposals in order to reach a design consensus among project team members.
3. Spring collection system – spring collection system modifications were not well defined in the PTR. Field trips and meetings were required to document the collection system and prepare an improvement plan.
4. Length of fish screen – length of fish screen was increased to 64 feet to provide adequate screen area to meet the required approach velocity.
5. Fish screen hoist – fish screen structure modified to include an overhead support for a hoist for maintenance purposes.
6. Alignment of fish screen – horizontal alignment of the fish screen changed to increase the work area at the east-end concrete abutment.
7. Fish bypass weir angle of fish bypass weir was changed to allow for better fish passage.
8. Diversion canal weir – a weir was added in the Eagle Canyon diversion canal to regulate the water surface elevation across the fish screen.
9. Diversion canal water elevation – discovered that the design water surface elevation in the diversion canal was approximately 1 foot higher than that reported in the PTR. As a result, the following changes were incorporated:

- Added a 12 inch plate above the fish screen
- Raised the fish screen platform and concrete abutments 12 inches
- Increased height of dam lip
- Increased size of slide gate at fish screen intake

5. Eagle Canyon Screen and Ladder: Mechanical Features

10. Hoist – a 1/2 Ton manual hoist was added to install and remove the fish screens. The hoist will convey the screens to a lay down area at the east end of the fish screen structure.
11. Flow control louvers – the louver configuration was changed from vertical to inclined at 30 degrees, parallel to fish screen panels, to provide better flow control.
12. Fish screen intake – gate size was revised to accommodate a change in water surface elevation at the diversion canal. See civil item above.
13. Fish screen structure – raised the structure and appurtenances by 12 inches to accommodate a change in water surface elevation at the diversion canal. See civil item above.
14. Primary trashrack – the trashrack was added upstream of the main entrance to protect the gates.
15. Secondary trashrack – design was modified when NOAA Fisheries added more fish passage ports.
16. Hydraulic lubricant – changed from food grade oil to biodegradable oil, required research and numerous discussions with participants to resolve.

5. Eagle Canyon Screen and Ladder: Electrical Features

17. System operation logic was developed to meet operational criteria acceptable to PG&E, DFG, NOAA Fisheries and USFWS. Five stage sensors will monitor water levels in the fish ladder and fish screen to ensure minimum instream flow requirements are met and ensure proper operation of the fish passage facility.
18. Fish monitoring - a cabinet was added to house the fish monitoring equipment and electrical power and conduit were added for the video cameras.
19. Trail lighting – lighting was added along the trail to enable PG&E staff to access the site at night if necessary.

6. North Battle Creek Feeder Screen and Ladder: Civil Features

1. Ladder design flow capacity- reconnaissance level identified a design capacity of 80 cfs. Detailed flow criteria analysis in final design increased the design flow of the ladder to 110 cfs.
2. Raise left dam abutment – the height of the dam specified in the preliminary design report was not sufficient to protect the facility for a 100-year event. The dam was raised an additional 5 feet and required additional analysis of the dam structure and the adjacent headwork's and fish screen structure.
3. Headwork's – preliminary design called for the headwork's structure to be left as is; in final design, the decision was made to replace it. The new structure will better accommodate the raised dam abutment and fish screen structure. A new structure will also facilitate construction.
4. The electrical and mechanical panels on the existing headworks were relocated. An equipment room was created in the larger headwork's structure to better protect the panels. This change also impacted and required coordination with mechanical and electrical engineers.
5. Fish screen realignment – Fish screen structure alignment was revised to move structure away from right bank, to minimize cuts into the hillside. Excavation of large cobbles and boulders with original alignment might prove difficult and unsafe during construction.
6. Fish ladder walkway – a sturdy, rolling walkway across the ladder was added. After initially pursuing a configuration that would be removable by one person, yet sturdy enough to support 2 persons lifting heavy stoplogs, participants agreed on a heavier, movable

walkway that could be left in place over the winter at the downstream end of the ladder, out of the reach of storm flows.
7. Footbridge – a footbridge was added during final design. Additional design time was required to coordinate the bridge location and details and ensure that the bridge alignment did not interfere with the layout of the fish screen, ladder and headwork's structure.
8. Participants also decided to remove screen panels, screen cleaner motors, and other equipment, from the site by raising them onto the footbridge. Designing a cable system and series of hoists to lift the items about 15 feet to the top of the bridge posed a number of logistical problems and required civil/mechanical/electrical time to evaluate alternatives and resolve problems.
9. Video monitoring - two alternatives to the camera and light mounting system were discussed with participants and designed to allow NOAA Fisheries appropriate access to the required bay in the fish ladder. Modifications to the mounting system required changes to drawings and specifications.
10. Sump pipe - After supports and a pipe had already been designed, participants decided to delete the sump pipe altogether.
11. Fish screen structure – at NOAA Fisheries request, the louver configuration was changed from vertical to inclined at 30 degrees, parallel to fish screen panels, to provide better flow control; this required structural modifications to the steel support structure.
12. Flow straightening vanes were added but were subsequently eliminated when the alignment of the fish screen structure was straightened and moved away from the right bank.

6. North Battle Creek Feeder Screen and Ladder: Mechanical Features
13. Headwork's – mechanical and electrical panels were relocated to new headwork's structure. See civil item above.
14. Hoist and cable rail system – a 1/2 Ton manual hoist was added to install and remove the fish screens and move equipment. Participants subsequently agreed to remove fish screens and other equipment by hoisting up to the new footbridge and a more elaborate hoist and cable rail system was needed to accomplish this. See civil item above.
15. Flow control louvers – the louver configuration was changed from vertical to inclined at 30 degrees, parallel to the fish screen panels, to provide better flow control.
16. Fish ladder orifice gates – changed from slide gates to custom flap gates, to accommodate concerns from PG&E and NOAA Fisheries that slide gate handles would bend and that a flap gate with cable actuation would be better.
17. Headworks slide gate - Original design called for recycling of the original head gate but during final design participants decided to replace it with a new gate because not enough information was available for the old gate. Also, the change in headworks design altered the head gate layout.
18. Dam sluice gate – revised the design due to changes in the sluiceway design and relocation of the mechanical panels.
19. Hydraulic lubricant – changed from food grade oil to biodegradable oil, required research and discussion with participants, primarily NOAA Fisheries, to resolve.

6. North Battle Creek Feeder Screen and Ladder: Electrical Features
20. System operation logic was developed to meet operational criteria acceptable to PG&E, DFG, NOAA Fisheries and USFWS. Five stage sensors will monitor water levels in the fish ladder and fish screen to ensure minimum instream flow requirements are met and ensure proper operation of the fish passage facility.

21. Fish monitoring - a cabinet was added to house the fish monitoring equipment and electrical power and conduit were added for the video cameras.

6. North Battle Creek Feeder Access Road and Footbridge

The access road and footbridge was not funded under the 1999 original proposal. This added cost is due to the provisions within the 1999 MOU and the conservative 'Three Point Philosophy' established pursuant to MOU provisions (Refer to 'Budget Justification Overview', Factor #1).

7. Soap Creek Feeder Dam Removal
The cost decreased from 1999 due to a better understanding of the feature and site conditions.

8. Lower Ripley Creek Dam Removal
The cost decreased from 1999 due to a better understanding of the feature and site conditions.

9. Asbury Pump Diversion
This item was not funded under the 1999 original proposal. The added cost is due to the need for facility modifications to provide for a flow release of 5 cfs into Baldwin Creek and to prevent anadromous fish from passing above Asbury Dam and potentially conveying diseases to trout at Darrah Springs Fish Hatchery.

10. Prescribed Instream Flow Releases
There is no funding needed for this item, pursuant to the 1999 MOU.

11. Water Acquisition Fund
There is no additional funding requested for this item.

12. Adaptive Management Plan (included in item 16 below)

13. Adaptive Management Fund
There is no funding needed for this item, pursuant to the 1999 MOU.

14. Water Rights at Dam Removals Dedicated to the Environment in perpetuity
There is no funding requested for this item.

15. Anadromous Fish Environmental Monitoring

Based on the comment in the September 2003 Technical Review Panel Report that $1M for anadromous fish monitoring is insufficient, the Restoration Project Adaptive Management Team evaluated the probable amount of fish monitoring needed, and increased the funding needed for this monitoring to $3.36M. (The estimate is for a three year period per CALFED advice on the periodic need for peer/technical review of the science).

16. Adaptive Management Plan (AMP) and Environmental Compliance
Refer to 'Budget Justification Overview', Factors #1 - #4. All four factors provide reasons for costs increases associated with developing the AMP and environmental compliance documentation, including the EIS/EIR, the ASIP, and CWA permits applications. Costs have

increased since May 2004 to account for the development of a draft supplemental NEPA/CEQA document, and staff and environmental contractor work efforts associated with an additional year of environmental compliance efforts.

17. Cost of Forgone Power During Construction
There is no additional funding requested for this item.

18. Construction Environmental Mitigation

There was not much funding requested in the 1999 proposal for environmental mitigation associated with construction impacts. A more detailed understanding of the site conditions and proposed designs revealed that there would be more environmental impacts than originally anticipated. In August 2003, it was estimated that $4M would be needed for environmental mitigation. Based on suggestions made by the TRP in the September 2003 Technical Review Panel Report, costs decreased significantly from the August 2003 $4M estimate to approximately $2M in May 2004 due to the Restoration Project Environmental Team making the biological determination that habitat types on CALFED-funded conservation easements would provide suitable mitigation credit for the predicted Restoration Project impacts to those habitat types. Since May 2004, costs have increased to account for the development of a Draft Supplemental EIS/ Revised EIR, environmental mitigation needs associated with the MLTF pathogen issue mitigation options, and for clearing/hazing and monitoring needs related to the Migratory Bird Treaty Act.

19. Construction Real Estate Compensation
This item was not funded under the 1999 original proposal. The cost associated with this item includes payments to each landowner for temporary easements on their properties, and costs associated with abandoning easements for decommissioned features and acquiring additional rights-of-way where new project features are placed on private lands.

20. Net Present Value of Annual Foregone Power during Construction
There is no additional funding requested for this item.

21. Net Present Value of Operation & Maintenance (O&M) Impacts
There is no funding requested for this item.

22. Mount Lassen Trout Farms (MLTF) Pathogen Issue
This item was not funded under the 1999 original proposal. A more detailed understanding of the site conditions revealed that there was potential for an IHN pathogen problem at MLTF facilities. Based on meetings and site visits, an estimate of approximately $2.3M was developed for potential impacts to the MLTF Jeff Coat East and West and Willow Springs Facilities in August 2003. However, after an April 2004 meeting with MLTF, it became apparent that the costs associated with the impacts would be higher. The current estimate accounts for additional design, environmental and construction costs associated with options to mitigate for impacts. These mitigation options include the installation of a pipeline, the installation of treatment facilities to disinfect water, the potential for modification of operations at a facility, the relocation of a facility, and the acquisition of a facility. These options include the consideration of leasehold interests (existing leases between MLTF and landowners). A complete description of the mitigation options for the MLTF Willow Springs

and Jeff Coat East and West facilities is in the February 2005 Draft Supplemental EIS/Revised EIR.

Explanation of Restoration Project Related Project Actions Costs:

1. Interim Flows:
A current interim flow agreement with PG&E (No. 03-WC-20-2554, dated September 30, 2003) is in effect until December 2005. CALFED funding was approved for this agreement in 2003, and in March 2004, an additional $1.5 M was approved through the Ecosystem Restoration Subcommittee Amendments Requests Process. However, the additional $1.5 M was approved by the Amendments Committee to be taken out of the CALFED Project No. 1999-B01 Restoration Project ($ 28 M) funds. Therefore the funding for the original 1999 Restoration Project proposal tasks decreased to $26.5 M. Because instream construction work is planned to not begin until 2006 at Wildcat and Eagle Canyon Diversion Dams and until 2009 for Coleman Diversion Dam, a new interim instream flow agreement will be developed, and it is estimated that $1.5 M of additional interim instream flow funding will be needed.

2. Coleman National Fish Hatchery Adaptive Management Plan (CNFH –AMP) Development Proposal:
A proposal was developed in response to the January 2004 CNFH Science Panel Report and subsequent February 2004 Workshop, and well as in response to the September 2003 Restoration Project Technical Review Panel Report. (Attachment A of this PSP)

3. CNFH -AMP Diagnostic Studies:
A proposal was developed in response to the January 2004 CNFH Science Panel Report and subsequent February 2004 Workshop, and well as in response to the September 2003 Restoration Project Technical Review Panel Report. (Attachment B of this PSP)

Executive Summary

Battle Creek Salmon and Steelhead Restoration Project

Submittal of this 2004 Ecosystem Restoration Proposal Solicitation Package (PSP) is to request supplemental funding in the total amount of $57.55 M to $64.05 M* to complete the proposed Battle Creek Salmon and Steelhead Restoration Project (Restoration Project), CALFED Project No. 1999-B01. The breakdown budget request is as follows:

- $53.31M to $59.81 M* for Restoration Project Tasks.
- $ 1.5 M approved by the Ecosystem Restoration Amendments Committee to be taken out of the CALFED Project No. 1999-B01 Restoration Project ($ 28 M) funds for continuance of interim flows in Battle Creek (Battle Creek Interim Flow Agreement - CALFED Project No. 2002-B02-DA).
- $ 1.5 M of additional funds for continuance of interim instream flows into 2006 at Wildcat and Eagle Canyon Diversion Dams and into 2009 at Coleman Diversion Dam.
- $0.24 M for Development of a Coleman National Fish Hatchery Adaptive Management Plan (CNFH AMP), pursuant to the September 2003 Technical Review Panel Report and January 2004 CNFH Science Panel Report. (Attachment A of this Proposal).
- $1 M for CNFH AMP Diagnostic Studies, pursuant the September 2003 Technical Review Panel Report and January 2004 CNFH Science Panel Report. (Attachment B of this Proposal.

* Note: This range is presented due to cost differences between the mitigation options associated with the Mount Lassen Trout Farms pathogen issue, which are identified in the March Draft Supplemental Draft EIS/Revised EIS. These mitigation options will be further investigated and discussed, and the agreed upon mitigation will be identified in the Final EIS/EIR.

The Restoration Project, originally funded by CALFED in 1999 In the amount of $28 M, stems from the June 1999 Memorandum of Understanding (MOU) between the National Marine Fisheries Service (NOAA Fisheries), U.S. Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (DFG) and Pacific Gas and Electric Company (PG&E). Since the establishment of the MOU, Restoration Project costs have substantially increased.

Items that have attributed to cost increases include:

- Design refinements associated with conservative design philosophies established pursuant to the 1999 MOU provisions.
- A better understanding of the site conditions, leading to the need for the collection of additional data, including design/engineering, geologic and environmental data.
- Increased design and environmental compliance document development efforts due to a better understanding of the site conditions, the collection of additional site data, and related project actions and processes. (This includes items, such as the potential IHN pathogen problem at Mt. Lassen Trout Farm hatcheries).

- CALFED independent technical review panels findings and recommendations (documented in the September 2003 Restoration Project Technical Review Panel Report and January 2004 Coleman National Fish Hatchery Report).
- Increase in construction material costs.

Battle Creek is a tributary of the Sacramento River (mouth is located at about Sacramento River Mile 272) located in northern California about 20 miles southeast of the city of Redding. The purpose of the Restoration Project is to restore approximately 42 miles of habitat in Battle Creek and an additional 6 miles of habitat in its tributaries while minimizing the loss of clean and renewable energy produced by the Battle Creek Hydroelectric Project, Federal Energy Regulatory Commission [FERC] Project No. 1121 (Hydroelectric Project). Habitat restoration would enable safe passage for naturally produced salmonids and would facilitate their growth and recovery in the Sacramento River and its tributaries. These salmonids include Central Valley spring-run Chinook salmon, state- and federally listed as threatened; Sacramento River winter-run Chinook salmon, state- and federally listed as endangered; and Central Valley steelhead, federally listed as threatened. The Restoration Project would be accomplished through the modification of Hydroelectric Project facilities and operations, including instream flow releases. The Proposed Action (which stems from the MOU) includes the removal of five small hydropower diversion dams, the addition of screens and ladders on another three dams, and the modification of several hydropower facilities to ensure continued hydropower operations.

Documents that compliment this PSP include:

1. The Restoration Project January 2004 Initial Response and May 2004 Final Response to the September 2003 Technical Review Panel Report.
2. The Restoration Project Adaptive Management Plan.
3. The Restoration Project Action Specific Implementation Plan.
4. Eight dam removal scenario information, including the March 15, 2004 Public Meeting notes and the report entitled 'Further Biological Analyses for Information Presented at the Public Meeting Held in Red Bluff, California, on March 15, 2004, Regarding the Differences between the Five Dam Removal Alternative and the Eight Dam Removal Alternative."
5. 1999 Memorandum of Understanding (MOU) between the National Marine Fisheries Service (NOAA Fisheries), U.S. Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (DFG) and Pacific Gas and Electric Company (PG&E).
6. Battle Creek Salmon and Steelhead Restoration Project Draft Environmental Impact Statement/Environmental Impact Report.
7. Battle Creek Salmon and Steelhead Restoration Project Draft Supplemental Environmental Impact Statement/Revised Environmental Impact Report.

The first four documents can be found on the California Bay Delta Authority website: http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemBattleCreek.shtml, and all of the documents can be found on the Battle Creek Restoration Project Website: http://www.usbr.gov/mp/battlecreek/.

Due to an additional funding estimate of $34 M in August 2003, the California Bay-Delta Authority (CBDA) called for an independent technical panel review of the Restoration Project. The Panel examined the work completed to date, information presented by the cooperating agencies, and additional materials requested by Panel members. The goal of the review was to provide a comprehensive evaluation of the technical merit of the Battle Creek Restoration Project and to strengthen the effort to restore salmon and steelhead in Battle Creek. The Panel completed a Technical Review Panel (TRP) Report in September 2003. The Restoration Project Management and Adaptive Management Teams prepared a January 2004 Initial Response, as well as a May 2004 Final Response to the TRP Report.

Compatibility of Coleman National Fish Hatchery (CNFH) operations with Battle Creek watershed restoration is a major concern of stakeholders engaged in planning and implementing restoration activities in the Battle Creek watershed. The CALFED Science Program formed an independent Science Panel to address these and other technical questions from a science perspective. In January 2004, a CNFH Science Report was issued, followed by a Science Report Workshop in February 2004.

Based on the Ecosystem Restoration Program Selection Panel Recommendation, issues identified by the Science Panel have been addressed in the Restoration Project AMP and the ASIP, and Restoration Project designs will be modified, as described in the Initial and Final Response to the September 2003 Technical Review Panel Report. In addition, to facilitate coordination of hatchery efforts and habitat restoration efforts, Attachments A and B of this PSP contain related action proposals to develop a CNFH Adaptive Management Plan (CNFH-AMP) and perform diagnostics studies associated with the CNFH-AMP.

Based on a TRP comment that consideration need be given to a project alternative with more complete decommissioning, an eight dam removal scenario was explored and compared to the Restoration Project Proposed Action (Five Dam Removal Alternative). A Public Workshop was held on March 15, 2004 to discuss information regarding the economics (replacement power costs), habitat benefits and process/schedule impacts of an eight dam removal scenario verses the Proposed Action. Subsequently, an April 2004 Report entitled, ‘Further Biological Analyses for Information Presented at the Public Meeting Held in Red Bluff, California, on March 15, 2004, Regarding the Differences between the Five Dam Removal Alternative and the Eight Dam Removal Alternative’ was developed.

As disclosed in the February 2005 Draft Supplemental EIS/Revised EIR, an eight dam removal scenario will not pursued further as a project alternative, due to the following:

- Incremental habitat benefits of the Eight Dam Removal Alternative would be only marginally better compared to the Five Dam Removal Alternative.
- The cost of replacement energy for the Eight Dam Removal Alternative would be excessive.
- The Five Dam Removal Alternative better achieves a key project objective of minimizing the loss of clean and renewable energy produced by the Battle Creek Hydroelectric Project.
- The Eight Dam Removal Alternative lacks support of a willing participant, as required by the CALFED Program objectives.

A. Project Description: Project Goals and Scope of Work

Submittal of this 2004 Ecosystem Restoration Proposal Solicitation Package (PSP) is to request supplemental funding in the total amount of $57.55 M to $64.05 M* to complete the proposed Battle Creek Salmon and Steelhead Restoration Project (Restoration Project), CALFED Project No. 1999-B01. The breakdown of the request is as follows:

- $53.31M to $59.81M* for Restoration Project Tasks, which integrate the CALFED Technical Review Panel input on both scientific framework and facility modifications.
- $ 1.5 M approved by the Ecosystem Restoration Amendments Committee to be taken out of the CALFED Project No. 1999-B01 Restoration Project ($28 M) funds for continuance of interim flows in Battle Creek (Battle Creek Interim Flow Agreement - CALFED Project No. 2002-B02-DA).
- $ 1.5 M of additional funds for continuance of interim instream flows into 2006 at Wildcat and Eagle Canyon Diversion Dams and into 2009 for Coleman Diversion Dam.
- $ 0.24 M for Development of a Coleman National Fish Hatchery Adaptive Management Plan (CNFH-AMP), pursuant to the September 2003 CALFED Technical Review Panel Report and January 2004 CALFED CNFH Science Panel Report. (Attachment A contains this Proposal).
- $ 1 M for CNFH-AMP Diagnostic Studies, pursuant the September 2003 CALFED Technical Review Panel Report and January 2004 CALFED CNFH Science Panel Report. (Attachment B contains this Proposal).

* Note: This range is presented due to cost differences between the mitigation options associated with the Mount Lassen Trout Farms pathogen issue, which are identified in the March Draft Supplemental Draft EIS/Revised EIS. These mitigation options will be further investigated and discussed, and the agreed upon mitigation will be identified in the Final EIS/EIR.

The Restoration Project, originally funded by CALFED in 1999 in the amount of $28M, stems from the June 1999 Memorandum of Understanding (MOU) between the National Marine Fisheries Service (NOAA Fisheries), U.S. Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (DFG) and Pacific Gas and Electric Company (PG&E). Within the MOU, a proposed project or 'Proposed Action' is described. Since the establishment of the MOU, project costs have substantially increased. (Refer to Budget Summary and Budget Justification Form for a description and justification of cost increases.)

Documents that compliment this PSP include:

1. The Restoration Project January 2004 Initial Response and May 2004 Final Response to the September 2003 Technical Review Panel Report.
2. The Restoration Project Adaptive Management Plan.
3. The Restoration Project Action Specific Implementation Plan.
4. Eight dam removal scenario information, including the March 15, 2004 Public Meeting notes and the report entitled 'Further Biological Analyses for Information

Presented at the Public Meeting Held in Red Bluff, California, on March 15, 2004, Regarding the Differences between the Five Dam Removal Alternative and the Eight Dam Removal Alternative."

5. 1999 Memorandum of Understanding (MOU) between the National Marine Fisheries Service (NOAA Fisheries), U.S. Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (DFG) and Pacific Gas and Electric Company (PG&E).
6. Battle Creek Salmon and Steelhead Restoration Project Draft Environmental Impact Statement/Environmental Impact Report.
7. Battle Creek Salmon and Steelhead Restoration Project Draft Supplemental Environmental Impact Statement/Revised Environmental Impact Report.

The first four documents can be found on the California Bay Delta Authority website: http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemBattleCreek.shtml, and all of the documents can be found on the Battle Creek Restoration Project Website: http://www.usbr.gov/mp/battlecreek/.

A1. Problem

Battle Creek is a tributary of the Sacramento River (mouth is located at about Sacramento River Mile 272) located in northern California about 20 miles southeast of the city of Redding. Battle Creek forms most of the boundary between Shasta and Tehama Counties. It drains 356 square miles and is dominated by the volcanic slopes of Mount Lassen. The Restoration Project is located in the anadromous fish reaches of Battle Creek and its tributaries. Natural barriers to anadromous fish migration in the form of large waterfalls are located on both the North and South Forks at river miles 13.48 and 8.85 respectively. The map in Figure 1 shows the key features of the Restoration Project.

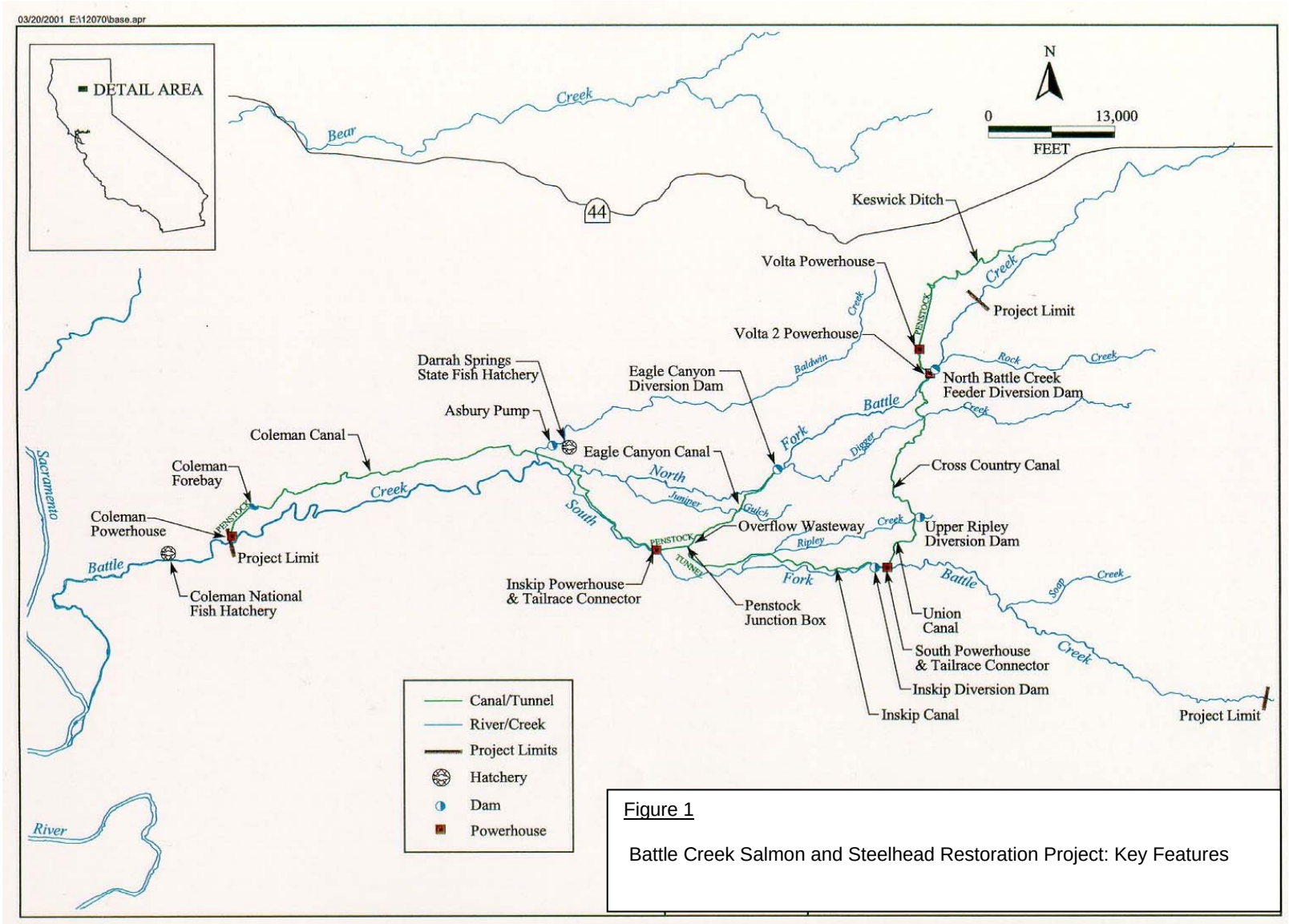


Figure 1

Battle Creek Salmon and Steelhead Restoration Project: Key Features

Over the last several decades severe declines in anadromous fishery populations have been identified in the Sacramento-San Joaquin Bay Delta and upper Sacramento River watershed. These declines have been variously attributed to water resource development, including the Bureau of Reclamation's Central Valley Project, the State Water Project, hydropower development, irrigation district facilities, commercial and sport fishing, ocean conditions, and other factors. This has led to the listing, at various levels, of several anadromous species under both the Federal and State Endangered Species Acts. The State and Federal listed species status of the populations of winter-run Chinook, spring-run Chinook, steelhead and fall and late-fall Chinook is shown in Table 1. Outside of the Sacramento River, Battle Creek is all that remains of the historical range where these five populations can coexist and it is believed that remnant populations still occur. Priorities of the Restoration Project for these populations are described in the Battle Creek Action Specific Implementation Plan (ASIP) and are according to the priorities established in the CALFED Multi-Species Conservation Strategy (MSCS). The ASIP is located on the California Bay Delta Authority website: http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemBattleCreek.shtml, and the Battle Creek Restoration Project Website: http://www.usbr.gov/mp/battlecreek/.

Table 1. State and Federal Listed Species Status of Battle Creek Anadromous Salmonid Populations

Species	Status	Listing Date
Chinook Salmon (*Oncorhynchus tshawytscha*)		
CESA[1]– Sacramento River Winter Run	Endangered	9/89
ESA[2]– Sacramento River Winter Run	Endangered	2/94
CESA[1]– Sacramento River Spring-Run	Threatened	2/99
ESA[2]– Central Valley Fall and Late-Fall Run	Candidate	9/99
ESA[2]– Central Valley Spring-Run	Threatened	11/99
Steelhead Trout (*Oncorhynchus mykiss*)		
ESA[2] – California Central Valley	Threatened	3/98

[1]CESA refers to California Endangered Species Act.
[2]ESA refers to federal Endangered Species Act.

Within the Battle Creek watershed, anadromous fish species have been affected by hydropower development. Hydropower facilities have substantially altered the natural stream flow, thereby reducing the amount of available anadromous fishery habitat for spawning, holding, and rearing. The Restoration Project would be accomplished through the modification of Battle Creek Hydroelectric Project, Federal Energy Regulatory Commission [FERC] Project No. 1121 (Hydroelectric Project) facilities and operations, including instream flow releases. Problems associated with the existing Hydroelectric Project include:

- Required minimum instream flows under the current FERC License are 3 cubic feet per second at the North Fork Diversions and 5 cubic feet per second at the South Fork diversions.
- Current lack of flow ramping procedures below the diversion dams may not meet the intent of State and Federal endangered species laws.

- Hydropower diversions indirectly increase temperature of current instream flows to levels that may be adverse to salmonid survival.
- Attraction of anadromous salmonids from the North Fork to the South Fork could lead to fish mortality, unstable population structure, and loss of production.
- Fish passage facilities at the dams do not ensure safe passage of adult and juvenile salmonids. Existing fish ladders were designed and built many years ago and do not meet current standards. Also, Hydroelectric Project diversions are currently unscreened, potentially causing mortality to fish entrained into canals and possibly discharged back to the stream through the powerhouses.

Other factors, such as gravel recruitment, riparian community structure, upland land use, channel geomorphology, and channel maintenance flows, are not considered limiting factors or key components in the fishery resource management problems in the Battle Creek ecosystem. Hydrologic and hydraulic conditions in the watershed do not preclude occurrence of high flow levels, which govern physical processes of channel and riparian resources, because hydropower dams are very small with little or no storage capacity.

Relevant Past Studies, Programs, Plans

Historically, Battle Creek is considered one of the most important Chinook salmon-spawning streams of the Sacramento-San Joaquin basin. The creek, flowing through deep, shaded canyons and riparian corridors, and maintained by cold, spring-fed water even in drought years, exhibits qualities ideal for restoration of salmon and steelhead species. The fishery restoration potential of Battle Creek has been recognized and supported in the following acts, programs, and plans:

- CALFED MSCS, which sets the goals for each species
- The Battle Creek Salmon and Steelhead Restoration Project Action Specific Implementation Plan (ASIP), with appended Adaptive Management Plan (AMP).
- Upper Sacramento River Fisheries and Riparian Habitat Management Plan (California Senate Bill 1086), 1989
- Central Valley Salmon and Steelhead Restoration and Enhancement Plan, California Department of Fish and Game, 1990
- California State Salmon, Steelhead Trout, and Anadromous Fisheries Program Act (California Senate Bill 2261), 1990
- Steelhead Restoration Plan and Management Plan for California, California Department of Fish and Game, 1990
- Central Valley Project Improvement Act Anadromous Fish Restoration Program (Title 34 of Public Law 102-5750), 1992
- CALFED California Bay-Delta Ecosystem Restoration Program
- Restoring Central Valley Streams – A Plan for Action, California Department of Fish and Game, 1993
- Actions to Restore Central Valley Spring-Run Chinook Salmon, California Department of Fish and Game, 1996

- National Marine Fisheries Service (NOAA Fisheries) Proposed Recovery Plan for Sacramento River Winter-Run Chinook Salmon, National Marine Fisheries Service (NOAA Fisheries), 1997
- U.S. Fish and Wildlife Service Draft Central Valley Anadromous Fish Restoration Plan, 1997 (finalized without revision in 2001)
- California Department of Fish and Game Status Review for Spring-Run Chinook Salmon in the Sacramento River, 1998

Recognition of the fishery restoration potential of Battle Creek led to the development of a "Battle Creek Salmon and Steelhead Restoration Plan - January 1999" (Ward and Kier 1999). This plan lays out a scientific framework for restoring Battle Creek to meet anadromous fish needs.

Purpose, Goals, Objectives, Hypotheses

The ASIP includes a detailed Adaptive Management Plan (AMP) containing objectives and associated hypotheses pertaining to salmon and steelhead populations, habitat, and passage, which are summarized in Table 2. The AMP contains substantial revisions responding to the CALFED Technical Review Panel comments. The ASIP and AMP are located on California Bay Delta Authority website: http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemBattleCreek.shtml, and the Battle Creek Restoration Project Website: http://www.usbr.gov/mp/battlecreek/.

The purpose of the Restoration Project is to restore approximately 42 miles of habitat in Battle Creek and an additional 6 miles of habitat in its tributaries to support species targeted for restoration in the CALFED MSCS and the Restoration Project ASIP. In addition, the purpose is to minimize the loss of clean and renewable energy produced by the Battle Creek Hydroelectric Project.

The conservation goals for fish in Battle Creek are those identified in the MSCS describing the CALFED program strategy for species included in the state and/or Federal endangered species acts as listed or candidate species. The Restoration Project as a CALFED directed action covers five anadromous salmonids in the genus Oncorhynchus. The relative priorities among these anadromous salmonids are set by recovery objectives presented in the MSCS and included in greater detail in the ASIP for the Restoration Project. The set of species in the first priority is winter-run salmon, spring-run salmon and steelhead. The set of species in the second priority are fall-run salmon and late fall-run salmon.

The Restoration Project's strategy to achieve conservation goals and objectives for the first priority species is to complete and adaptively manage a comprehensive suite of habitat restoration actions that change flows and water diversion facilities in Battle Creek. Each of the priority species has populations in other parts of the upper Sacramento River basin. A fundamental principle of fish and wildlife conservation biology is the probability that a species will recover to a healthy status in a timely manner

and depends upon the number of independent, self-sustaining, genetically viable populations that are in the river basin.

Presently, populations of spring-run Chinook are very low and winter-run Chinook are extremely scarce with no documented occurrences in recent years. However, attaining the goal of reestablishing genetically viable populations in Battle Creek will significantly contribute to recovery of these species in the upper Sacramento River. The exceptional drought-resistant nature of the Battle Creek watershed will make its salmonid populations extremely valuable in the years following a catastrophic drought when the entire basin's populations must rebuild. This is especially the case for Sacramento River winter-run Chinook populations that are predicted to experience egg incubation mortalities ranging from 17 to 86 percent in critically to extremely critical dry years (10 to 3 percentile occurrence, respectively) (USBR 1991). The presence of dependable cold water springs in the North Fork of Battle Creek, and to a lesser extent the South Fork, are expected to create refugia during these critical times.

It will take a substantial amount of time to achieve recovery of winter-run and spring-run Chinook due to the combination of low population levels and a 3 to 4 year reproductive life cycle. Achieving the goal of recovery for the first priority species requires establishment of genetically viable populations. Currently a multi-agency team, referred to as the Central Valley Technical Recovery Team and under the direction of NOAA Fisheries, is developing numeric goals and specific actions for the recovery of winter-run and spring-run in the Central Valley. This team should have recommendations for Battle Creek by the time the Restoration Project is completed (2009). In the interim the Restoration Project ASIP identifies a goal of 1,000 individuals. This value is one to three orders of magnitude more than the observed numbers of spring-run and winter-run, respectively. The coarse estimate of carrying capacity with moderately restored habitat in Battle Creek indicates there is space to accommodate the interim population goal, generally by a factor of two for most species. The carrying capacity for the restored system is unknown at this time. There is currently not sufficient predictive capability to accurately estimate the fish populations or races supported by habitat when it becomes functional. This conclusion is generally supported by a US Environmental Protection Agency workshop on stream ecosystem recovery (Cairns 1990).

The re-introduction strategy for a genetically viable population of winter-run Chinook may take an experimental approach that supplements populations in Battle Creek, similar to that occurring for the Sacramento River population. However, before that can be considered all the actions must be competed in accordance with the in the NOAA Fisheries 1997 draft winter-run recovery plan (NOAA 1997). These guidelines are also accepted by the DFG. The winter-run recovery plan describes the need to conduct a feasibility analysis for establishing a viable, naturally self-sustaining population with recommendations for establishing supplemental or experimental populations. In the 1997 draft it was envisioned that this program of developing supplemental populations could be implemented in a manner that would not create an undue regulatory burden on other users of resources in the watershed because of the recognized need to treat it as an experimental approach (refer to ASIP pg. 4-26, AMP pg. 23).

There is no available draft recovery plan for spring-run Chinook but the Central Valley Technical Recovery Team is working towards developing specific actions for recovery of spring run over their historical range, including Battle Creek (refer to ASIP pg. 4-27). An experimental approach to spring-run reintroduction that includes supplementation is unlikely for several reasons. A small run of spring-run Chinook salmon currently exists in Battle Creek, insufficient genetic information is available on Battle Creek to recommend a donor population, and if a genetically suitable donor population was identified it is unlikely there would be excess individuals for this use. Supplementation proposals for spring-run Chinook and steel head would be vastly different since a donor population of steelhead could come from Coleman National Fish Hatchery (CNFH) or the fish trap at Keswick Dam (at the Bureau of Reclamation facility on the Sacramento River below Shasta Dam) if either of these sources were deemed appropriate. Conversely there are no genetically acceptable hatchery produced spring-run Chinook salmon nor a wild population with excess individuals that could be used for supplementation. The supplementation program for steelhead which started in 1996 was recently suspended due to concerns expressed by the CALFED science panels, and others, regarding the impacts from hatchery produced steelhead on naturally produced steelhead.

The Restoration Project activities directed at achieving conservation goals and objectives for the second priority species of fall and late fall-run Chinook are similar to the first priority species (i.e. improved flows and facilities) with some important exceptions. Passage of salmonids above the CNFH Barrier Weir is currently managed to the extent controllable to benefit first priority species. The Barrier Weir is a partial barrier to fish migration that is operated to minimize potential negative effects of CNFH on first priority species (e.g. hybridization and superimposition of redds). Once priority species restoration is attained, future management of Battle Creek may also target fall/late fall-run salmon. Restoration of fall and late fall-run would only be further delayed or interrupted after the first priority species have achieved viable populations if it is demonstrated that their restoration impedes the ability these first priority species to maintain viable populations and no other adaptive management actions can be taken to assist the first priority species (refer to ASIP Table 1-2, AMP pg. 23). At the point the second priority species become a target of the Restoration Project, the population goals will be consistent with the Anadromous Fisheries Restoration Project goals (USFWS 2001).

The ASIP is the comprehensive plan for the Restoration Project under the CALFED Program. General goals and objectives associated with the Restoration Project include:

- Contribution to the species goals in the CALFED MSCS.
- Implemention of the CALFED Ecosystem Restoration Program Plan actions and CALFED Record of Decision Stage I.
- Restoration of naturally self-sustaining genetically viable populations of Chinook salmon and steelhead by reliably meeting their habitat requirements through voluntary modification and re-operation of the Hydroelectric Project Partnerships include state and federal agencies, a third-party donor, and PG&E.

- Up-front certainty regarding specific restoration components, including Resource Agency-recommended instream flow releases, selected removal or decommissioning of dams at key locations in the watershed, dedication of water diversion rights for instream purposes at decommissioned sites, construction of tailrace connectors, and installation of state-of-the-art fish screens and fish ladders meeting contemporary state and federal criteria.

Table 2. Restoration Project Objectives & Hypotheses

POPULATION OBJECTIVE 1
Ensure successful salmon and steelhead spawning and juvenile production.
HYPOTHESIS: Implementation of instream flow levels and facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure that juvenile salmon and steelhead production is within the expected level given the number of spawning adults and relevant ecological factors.
POPULATION OBJECTIVE 2
Restore and recover the assemblage of anadromous salmonids (i.e., winter-run Chinook, spring-run Chinook, steelhead) that inhabit the streams' cooler reaches during the dry season.
HYPOTHESIS: Implementation of instream flow levels and facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure that populations of spring-run Chinook, winter-run Chinook and steelhead are at viable population levels.
POPULATION OBJECTIVE 3
Restore and recover the assemblage of anadromous salmonids (i.e., fall-run Chinook, late-fall-run Chinook) that enter the stream as adults in the wet season and spawn upon arrival.
HYPOTHESIS: Implementation of instream flow levels and facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure that populations of fall-run Chinook and late-fall-run Chinook are at viable population levels.
POPULATION OBJECTIVE 4
Ensure salmon and steelhead fully utilize available habitat in a manner that benefits all life stages, thereby maximizing natural production and full utilization of ecosystem carrying capacity.
HYPOTHESIS: Implementation of instream flow levels and facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure that, once populations of anadromous salmonids are at viable population levels, the natural production of populations of anadromous salmonids within the Restoration Project Area is maximized based on full utilization of habitat and ecosystem carrying capacity.
HABITAT OBJECTIVE 1
Maximize usable habitat quantity – volume.
HYPOTHESIS: Implementation of instream flow levels specified in the description of the Restoration Project, and implementation of any adaptive responses affecting instream flows, will provide at least 95% of maximum usable habitat quantity for critical life stages among priority species.
HABITAT OBJECTIVE 2
Maximize usable habitat quantity – water temperature.
HYPOTHESIS: Implementation of instream flow levels and facilities modifications specified in the description of the Restoration Project, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will provide instream water temperatures that are suitable for critical life stages among species at appropriate stream reaches.
HABITAT OBJECTIVE 3
Minimize false attraction and harmful fluctuation in thermal and flow regimes due to planned

outages or detectable leaks from the hydroelectric project.
HYPOTHESIS: Implementation of facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure that water discharges from the powerhouse tailrace connectors or water conveyance system are confined to times and amounts that avoid false attraction.
HABITAT OBJECTIVE 4
Minimize stranding or isolation of salmon and steelhead due to variations in flow regimes caused by hydroelectric project operations.
HYPOTHESIS: Implementation of facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure variations in flow regimes, following forced or scheduled outages where the available diversion flow has been released to the natural stream channel, do not strand salmon and steelhead or isolate them from their habitat when diversions are resumed.
PASSAGE OBJECTIVE 1
Provide reliable upstream passage of salmon and steelhead adults at North Battle Creek Feeder, Eagle Canyon, and Inskip Diversion Dams per Contemporary engineering standards/guidelines.
HYPOTHESIS: Implementation of facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will insure unimpeded passage of adult salmon and steelhead at fish ladders relative to Contemporary standards/guidelines.
PASSAGE OBJECTIVE 2
Provide reliable downstream passage of juveniles at North Battle Creek Feeder, Eagle Canyon, and Inskip Diversion Dams per contemporary criteria after the transfer of facilities to Licensee.
HYPOTHESIS: Implementation of facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure that hydraulic parameters at fish screens meet Contemporary criteria at all times.
PASSAGE OBJECTIVE 3
Provide reliable upstream passage of adult salmon and steelhead to their appropriate habitat over natural obstacles within the Restoration Project Area while maintaining an appropriate level of spatial separation among the runs.
HYPOTHESIS: Implementation of instream flow levels and facilities modifications specified in the description of the Restoration Project, implementation of the Facilities Monitoring Plan, and implementation of any adaptive responses affecting instream flows or hydroelectric project facilities, will ensure that natural instream barriers do not impede upstream migration of adult salmon and steelhead at prescribed flows and normal wet season flow regimes.

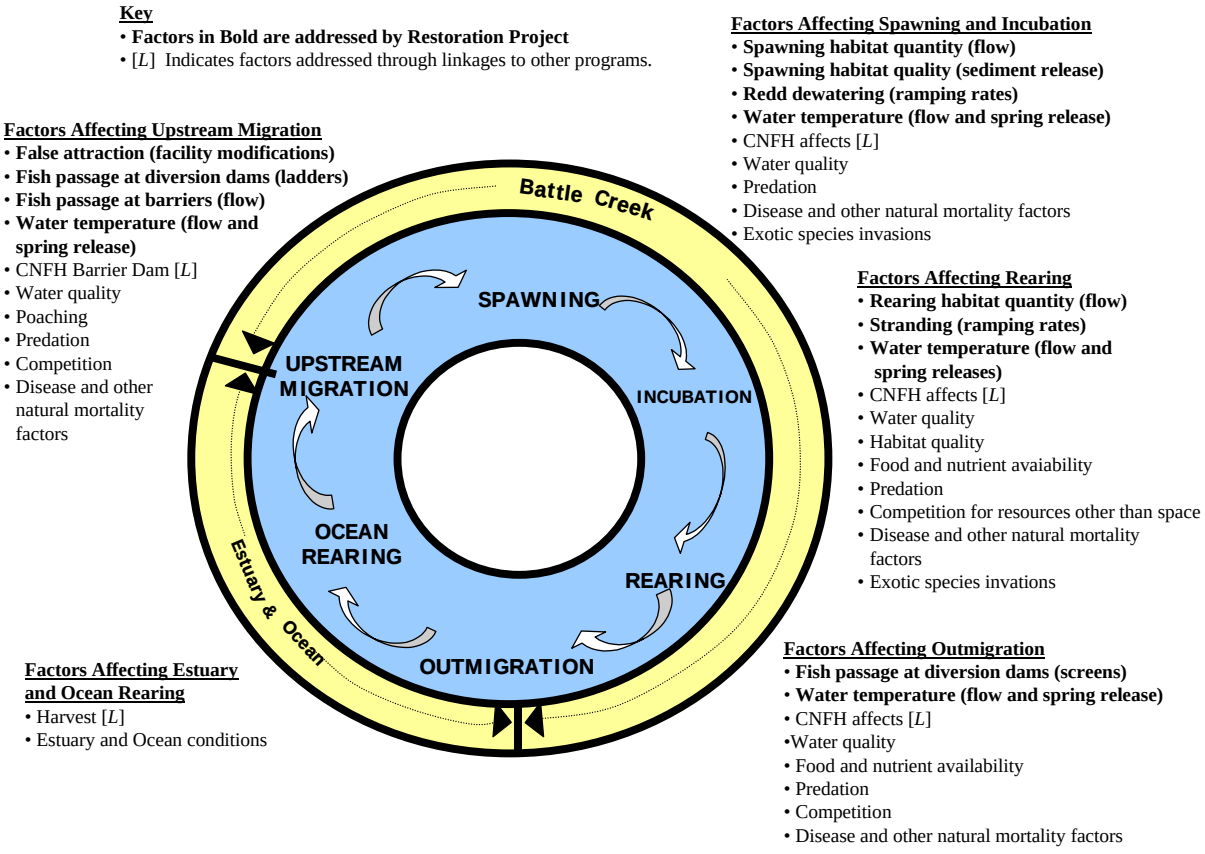
A2. Justification

Biological Justification

The initial assessment for the Restoration Project focused on factors limiting populations of anadromous salmonids in Battle Creek following a life-cycle and watershed-based approach (Ward and Kier 1999). This approach considered all the usual impacts to salmonid populations including changes to freshwater habitat, harvest influences, hydropower facilities and hatchery effects. These factors are illustrated in the Conceptual Model 1 figure. The Restoration Project and its Adaptive Management Program focuses on improvements designed to reduce factors limiting freshwater life stages of anadromous salmonids affected by the Battle Creek Hydroelectric Project. Other limiting factors (e.g. harvest, hatcheries, and other habitat issues) are identified in the AMP, but

are more appropriately addressed by other programs identified as being linked to the Restoration Project.

Development of a full life cycle model that includes the Sacramento River, its estuary and the Pacific Ocean is unnecessary as a specific activity for this project because it is a task scheduled for broader programs in the Central Valley. The Restoration Project approach is to provide the relationship between the number of spawners in Battle Creek and out migrants going from the creek to the river (i.e., Battle Creek population and productivity data) for the basin wide modeling of other programs that include the river, estuary and ocean. The basin level modeling effort is required under the Central Valley Project Improvement Act provisions calling for development of readily usable, broadly available models and supporting data to evaluate the ecologic and hydrologic effects in the Sacramento River system (Section 3406 (g)).



Conceptual Model 1. Battle Creek limiting factors model with key uncertainties and key linkages
(Source: April 2004 Draft AMP)

Fish passage at diversion dams was considered in light of state and federal standards for fish ladders and criteria for fish screens established to maximize the effectiveness of

these types of facilities for salmon and steelhead. Furthermore, the cost of fish passage facility modification at diversion dams was compared with diversion dam decommissioning. Finally, economic models of power production were used to estimate economic impacts of various restoration scenarios.

Structural and non-structural restoration measures were developed and reviewed by a CALFED appointed Technical Review Panel. Necessary revisions were made based on reviewers' comments. The refined project design and scientific framework, including updated funding needs, provide for the long-term assessment of how well the Restoration Project achieves restoration goals, and a science based process, with financial means, for any necessary adjustment on-the-ground. Thus this approach maximizes reliability by monitoring the results of restoration actions and responding to changed circumstance or new knowledge with adaptive actions. Key to this post-construction phase of the Restoration Project is the establishment of a science framework that: 1) builds on the concepts and models presented in the AMP, 2) describes the present condition of the stream and fish habitat (as a baseline), 3) implements comprehensive monitoring designs, and 4) describes specific assessment analyses for comparing observed vs. predicted outcomes and hypothesis testing. In addition, specific criteria are used to assess the validity of underlying assumptions and scientific hypotheses, and provide a means to evaluate success in meeting individual goals and objectives.

A3. Approach

The purpose of the Restoration Project is to restore approximately 42 miles of habitat in Battle Creek and an additional 6 miles of habitat in its tributaries while minimizing the loss of clean and renewable energy produced by the Hydroelectric Project. Habitat restoration would enable safe passage for naturally produced salmonids and would facilitate their population growth and recovery in the Sacramento River and its tributaries. First priority species recovery goals include Sacramento River winter-run Chinook salmon, state- and federally listed as endangered; Central Valley spring-run Chinook salmon, state- and federally listed as threatened; and Central Valley steelhead, federally listed as threatened (see Table 1 for more details). The second priority species recovery goals include fall and late fall-run Chinook which will be managed to the extent their recovery does not interfere with the first priority recovery goals. The Restoration Project would be accomplished through the modification of Hydroelectric Project facilities and operations. The Restoration Project Proposed Action (which stems from the 1999 MOU) includes removal of five small hydropower diversion dams, construction of new screens and ladders on three dams, modification of several hydropower facilities to ensure continued hydropower operations, and significant increases of instream flow releases. The Proposed Action and other project alternatives are being evaluated in National Environmental Policy Act and California Environmental Quality Act processes, and a Draft Battle Creek Salmon and Steelhead Restoration Project Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) and a Battle Creek Salmon and Steelhead Restoration Project Draft Supplemental EIS/Revised EIR have been developed. These documents are located on the Battle Creek Restoration Project Website: http://www.usbr.gov/mp/battlecreek/.

Summary of Restoration Project Proposed Action Features

1. **Coleman Diversion Dam**
   - Installation of a tailrace connector from Inskip Powerhouse to Coleman Canal and a water bypass facility around Inskip Powerhouse to Coleman Canal.
   - Removal of dam and appurtenant facilities.

2. **Inskip Diversion Dam**
   - Installation of a fish screen and fish ladder.
   - Installation of a tailrace connector from South Powerhouse to Inskip Canal.
   - Development of an access road to Inskip Dam.

3. **South Diversion Dam**
   - Removal of dam, related water conveyance (South Canal) and appurtenant facilities.

4. **Wildcat Diversion Dam**
   - Removal of dam, related water conveyance (Wildcat Canal) and appurtenant facilities.

5. **Eagle Canyon Diversion Dam**
   - Installation of a fish screen and fish ladder.
   - Modification of spring collection facilities.

6. **North Battle Creek Feeder Diversion Dam**
   - Installation of a fish screen and fish ladder.
   - Development of an access road to North Battle Creek Feeder Diversion Dam.
   - Installation of a bridge across the stream to access fish screen and fish ladder facilities.

7. **Soap Creek Diversion Dam**
   - Removal of dam, related water conveyance and appurtenant facilities.

8. **Lower Ripley Creek Diversion Dam**
   - Removal of dam, related water conveyance and appurtenant facilities.

9. **Asbury Pump Diversion**
    - Provide for a means to release an instream flow of 5 cfs from Asbury Pump Diversion into Baldwin Creek and to prevent anadromous fish from passing above Asbury Dam and potentially conveying diseases to trout at Darrah Springs Fish Hatchery.

10. **Prescribed Instream Flow Releases (shown in Tables 3 and 4)**

11. **Water Acquisition Fund**

12. **Adaptive Management Plan (included with item 16 below)**

13. **Adaptive Management Fund**

14. **Dedication of water rights to the environment (in perpetuity) at all dam removals.**

15. **Anadromous Fish Monitoring**

16. **Adaptive Management Plan (AMP) and Environmental Compliance**

17. **Environmental Mitigation for Construction**

18. **Real Estate Compensation for Construction**

19. **Cost of Foregone Power During Construction**

20. **Net Present Value of Annual Foregone Power**

21. **Net Present Value of Operations and Maintenance (O&M) Impacts**

22. **Mount Lassen Trout Farms IHN Pathogen Issue**

Restoration Project Related Actions Associated with this Proposal:

1. **Interim Flows:** A current interim flow agreement with PG&E (No. 03-WC-20-2554, dated September 30, 2003) is in effect until December 2005. CALFED funding was approved for this agreement in 2003 and, in March 2004, an additional $1.5 million was approved through the Ecosystem Restoration Program Amendments Worskshop Process. However, the additional $1.5 million was approved by the Amendments Committee to be taken out of the CALFED Project No. 1999-B01 Restoration Project ($28 M) funds. Therefore the funding for the original proposal tasks decreased to $26.5 M. In addition, because instream construction work is now not planned to begin until 2006 at Wildcat and Eagle Canyon Diversion Dams and until 2009 at Coleman Diversion Dams, a new interim instream flow agreement will be developed,

and it is estimated that $1.5 M of additional interim instream flow funding will be needed.

2. **Coleman National Fish Hatchery Adaptive Management Plan (CNFH-AMP) Development Proposal:** This proposal was developed in response to the January 2004 CNFH Science Panel Report and subsequent February 2004 Workshop, as well as in response to the September 2003 Restoration Project Technical Review Panel Report. (This proposal in Attachment A)

   The primary reason for the CNFH-AMP being separate from, but closely coordinated with, the Restoration Project, is that each of these activities have very different institutional authorities for decision making, funding and dispute resolution (eg. the Restoration Project is under Federal Energy Regulatory Commission and the hatchery is under Department of Interior). Adaptive management must be able to make changes when and where needed and, therefore, the programs must be structured within purview of the appropriate authorities to make the needed changes.

3. **CNFH-AMP Diagnostic Studies Proposal:** This proposal was developed in response to the January 2004 CNFH Science Panel Report and subsequent February 2004 Workshop, as well as in response to the September 2003 Restoration Project Technical Review Panel Report. (This proposal in Attachment B)

Table 3. Summary of prescribed instream flow releases from dams in the anadromous fish reaches of the North and South Forks following completion of the Restoration Project

Dam	Fork	Monthly Minimum Flow (cfs) to be Released From Dam											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Keswick	North	3[A]	3[A]	3[A]	3[A]	3[A]	3[A]	3[A]	3[A]	3[A]	3[A]	3[A]	3[A]
NBCF	North	88[F]	88[F]	88[F]	67[F]	47[F]	47[F]	47[F]	47[F]	47[F]	47[F]	47[F]	88[F]
Eagle	North	46[S]	46[S]	46[S]	46[S]	35[S]	35[S]	35[S]	35[S]	35[S]	35[S]	35[S]	46[S]
Wildcat	North	Facility decommissioned; no instream flow requirement											
South	South	Facility decommissioned; no instream flow requirement											
Inskip	South	86[P1]	86[P1]	86[P1]	61[P1]	40[P1]	40[P1]	40[P1]	40[P1]	40[P1]	40[P1]	40[P1]	86[P1]
Coleman	South	Facility decommissioned; no instream flow requirement											

[A] Accretion flows downstream of the Keswick Dam can exceed 100% of maximum weighted useable area (WUA) for steelhead spawning in the portion of the Keswick reach available to anadromous fish and can exceed predictive capability of the Instream Flow Incremental Methodology (IFIM) model (TRPA 1998a). Accretion flows downstream of the Keswick Dam provide greater than 90% of maximum WUA for steelhead rearing in the portion of the Keswick reach available to anadromous fish.

[F] On occasion the release is not available due to quantity of inflow reaching North Battle Creek Feeder Diversion. Additional inflows to the North Battle Creek Feeder reach are occasionally received from the junction box of Volta 2 Powerhouse tailrace and Cross Country Canal a short distance downstream.

[S] Eagle Canyon Dam releases reported in this table include releases from Eagle Canyon Springs (those springs located downstream of Eagle Canyon Dam that were included in the "interim flow agreement" between PG&E and USBR; USBR 1998).

[P1] The prescribed instream flow will be the total available inflow in the South Fork upstream of the South Powerhouse at times when the available inflow is less than the prescribed flow.

Table 4. Summary of prescribed instream flow releases from diversions in tributaries affecting anadromous fish reaches of Battle Creek and tributaries based on best available information.

Diversion	Monthly Minimum Flow (cfs) To Be Released from Tributary Diversions											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Eagle Canyon Spring	All[D]	All[D]	All[D]	All[D]	All[D]	All[D]	All[D]	All[D]	All[D]	All[D]	All[D]	All[D]
Soap Creek	Facility Decommissioned; no instream flow requirement											
Lower Ripley Creek	Facility Decommissioned; no instream flow requirement											
Baldwin Creek	5[C]	5[C]	5[C]	5[C]	5[C]	5[C]	5[C]	5[C]	5[C]	5[C]	5[C]	5[C]

[D] Flow from Eagle Canyon Springs enters Battle Creek in the vicinity of Eagle Canyon Dam and is included in Eagle Canyon Dam releases shown in Table 3. These springs are limited to those that were included in the "interim flow agreement" between PG&E and USBR (USBR 1998) and will be released to maximize cooling of Battle Creek.
[C] The flow value reported for Baldwin Creek represents the maximum instream flow release.

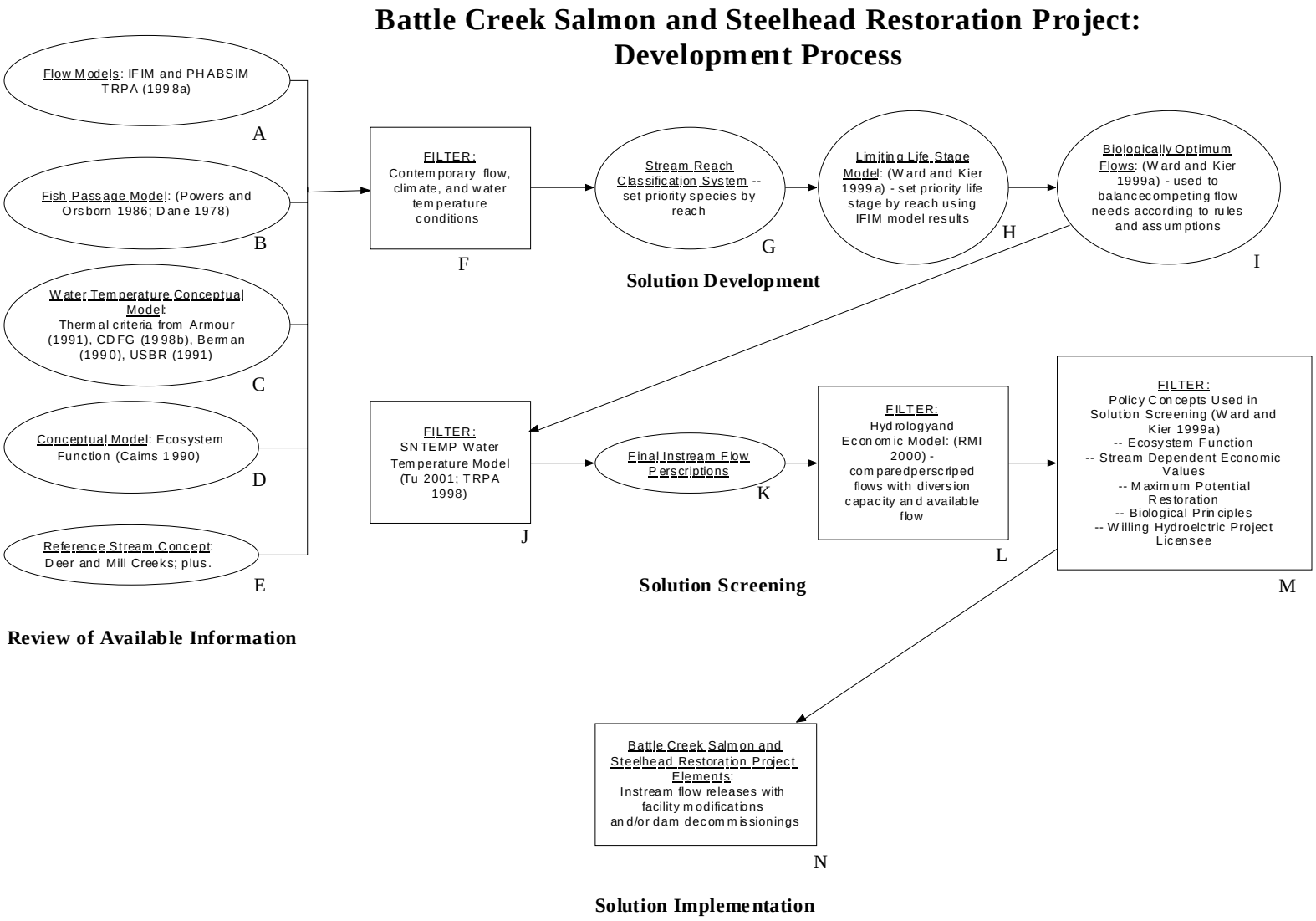
The process by which the Restoration Project was developed is illustrated in the Conceptual Model 2 figure. The initial process and concepts were guided by several previous restoration planning efforts for Battle Creek dating from the 1980's and were shaped by several legal mandates (see Conceptual Model 2 for specifics). Within this framework, several stakeholder groups, PG&E (the owner of the Hydroelectric Project) and state and federal agencies worked together within the Battle Creek Working Group (BCWG) forum to review available information, to identify the problems facing anadromous salmonids in Battle Creek, to screen alternate solutions, and to identify a restoration project that was technically feasible, acceptable to the community, stakeholders, and PG&E, and which met numerous policy constraints. Eventually, elements were identified and further refined through direct negotiations with PG&E culminating in the MOU, which became the foundation for the Restoration Project.

The primary action proposed in the Restoration Project is increasing the flow of surface water and cold spring water in the stream channel using the Instream Flow Incremental Methodology. The Instream Flow Council (2002) recommends that adaptive management be used to answer critical uncertainties for the instream flow-setting process as described in Castleberry et al. (1996). The three recommended steps in this adaptive management approach were incorporated with the Restoration Project flow setting methodology as follows.

- Set conservative, resource-protective interim flow standards based on available information. The flow setting process used by the Biological Team of the Battle Creek Working Group (Ward and Kier 1999) developed a conservative resource protective minimum flow regime predicted to provide 89 to 95 percent of usable habitat based on predictive models for flow (TRPA 1998a) and temperature (Tu 2001). The results of this flow setting process were more protective than that of the typical FERC regulatory process due to the influence of a substantial contribution of public funds in the negotiation process.

- Establish a credible monitoring program that allows interim standards to serve as experiments. The Restoration Project MOU includes a funded Adaptive Management Program with detailed monitoring and focused studies expected to monitor the effectiveness of the new flow regime, verify model predictions and attainment of habitat objectives.

- Establish an effective procedure that allows revision of the interim flows. If monitoring of the Restoration Project does not substantiate the modeled predictions, the Adaptive Management Program has the flexibility to make changes to the models and implement another flow option predicted to be more effective. Flow increases can be accommodated with the use of both a publicly funded Water Acquisition Fund and an Adaptive Management Fund. Together these funding sources have an estimated maximum purchasing capability of 13,000 acre feet per year 3 years after completion of construction.



Conceptual Model 2. Model illustrating the development of the Restoration Project
(Source: April 2004 Draft AMP)

The flow setting process also integrated temperature needs of the various life stages of the species using predictions from the SNTEMP Model (Tu 2001). Temperature tolerance varies among species and among life stages in the same species. The presence and absence of temperature sensitive life stages in each reach varies seasonally and was based upon results of life history studies from the nearby Sacramento River as well as available data for Battle Creek. The Adaptive Management Program includes measures to increase flow releases to manage temperatures on a real time basis to the extent controllable.

The flow setting process also integrated the estimated flow needs for fish to pass over natural obstacles in the stream (TRPA 1998b). The Adaptive Management Program includes measures to increase flow releases for passage or modify the natural obstacles as appropriate for target species.

The flow setting process also integrated the estimated flow needs for sediment transport to maintain healthy conditions in the stream channel and overall variability in the hydrograph. Examining the hydrographs estimated for the Restoration Project indicates seasonal pattern of the hydrograph is maintained because there is no major storage reservoir in the Battle Creek hydro system to impair runoff from storm and snow melt events and the hydro diversions are small relative to wet season events. Geomorphic studies in Battle Creek (Kondolf and Katzel 1998) did not find any evidence of serious sediment imbalance in the Battle Creek system indicating the dams are not seriously impacting sediment transport. This is likely due to the small size of the dams relative to the normal runoff events and the operation of the sluice gates. The magnitude of a flood event that moves sediment was estimated at a 1.5-year return frequency using tracer rocks. The diversion quantities are small relative to the magnitude of the 1.5 year return flood. Some scientific uncertainty exists regarding sediment transport relations in the Battle Creek system as recognized and addressed in the Sediment Management Plan that will be part of the Adaptive Management Program.

The Restoration Project Proposed Action (5 Dam Removal Alternative), as identified in the Draft EIS/EIR and Supplemental Draft EIS/Revised EIR (Draft EIS/EIR 2003, Draft SEIS/REIR 2005) builds and maintains fish ladders on Eagle Canyon, Inskip and North Battle Creek Feeder Dams, which are significantly larger than existing facilities (exit/attraction flows on new ladders are 30 to 50 times existing levels). In addition, the Proposed Action alternative removes five dams leaving passage conditions as they were before the dams were constructed. Adult passage delays for salmon are not considered significant unless they exceed three days (Katapodis 1992). Delay problems can be related to shut downs for maintenance and sub-standard amounts of attraction flow at the ladder exit during extreme high-flow events. The designs for the three new ladders meet all present standards to avoid delay problems (DWR 2000). The current accepted standard for ladder design during extreme high-flow events is to allow a delay exceeding three days to occur once every ten years during flows when fish can move in the channel (Katapodis 1992, DWR 2000). Such a long reoccurrence interval is considered to reduce the impact of this delay to insignificant because it is encountered by such a small portion of the total population over a decade. Maintenance requirements for ladders are expected

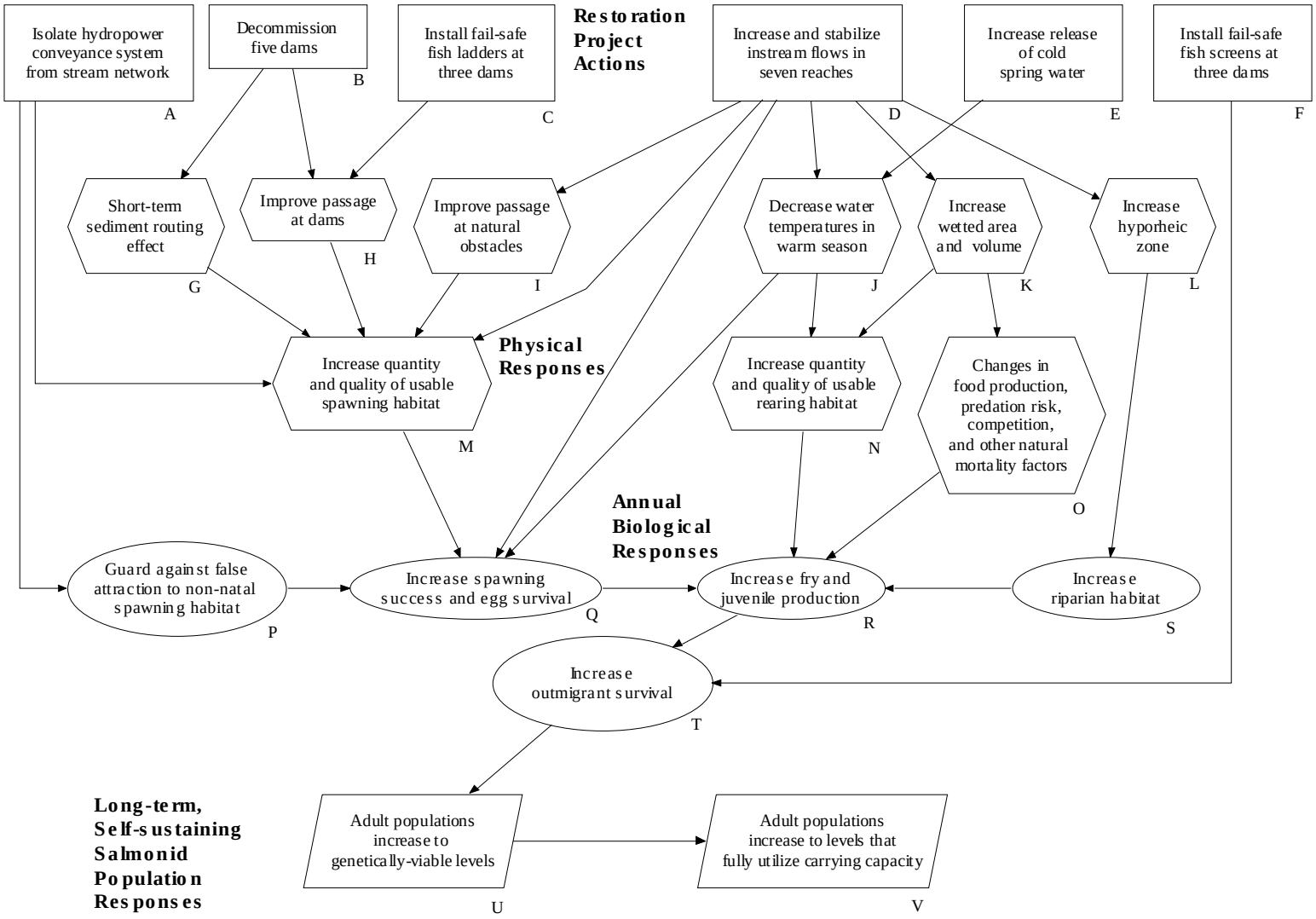
to cause less than a three-day delay for migrating fish at any one time under the Proposed Action. Maintenance caused delays should be less than past due to design improvements in the proposed ladders including: enlarged size, installation of trash racks and floodwalls, improved accessibility, and installation of remote sensing equipment to detect problems and summon maintenance efforts as needed. The three new fish ladders are not expected to cause a significant impact to the migration of salmon and steelhead.

The Restoration Project Proposed Action also builds and maintains screens at the same three dams and will automatically stop the diversion during malfunction (DWR 2000). Consequently, the Adaptive Management Plan is funded with up to six million dollars for necessary modifications to facilities. Under the MOU the owner of the Hydroelectric Project is responsible for maintenance and replacement of facilities. The CALFED Technical Review Panel found the designs to meet all current standards and criteria for fish passage and some refinements were made to designs as a result of this review.

The Restoration Project incorporates a multifaceted adaptive management approach to restoration that uses the best available science to develop a comprehensive solution to meet fisheries restoration goals and objectives. The Restoration Project implementation plan is illustrated in the Conceptual Model 3 figure.

The adaptive management approach makes use of detailed monitoring and data assessment approaches for each objective, identified timelines, trigger events, responses, response limits, response evaluations, and end points. The scientific methods and criteria used to test each hypothesis are developed into a monitoring and data assessment approach and are comprised of established and routine procedures, surveys, analyses, and modeling. These scientific methods will comply with all contemporary standard methods and reporting practices that are adopted by CALFED and Resource Agencies as they are developed, with provisions for updating methods based on contemporary scientific norms. For each objective, an implementation schedule, or timeline, is developed. This ***timeline*** lists the duration and order of monitoring activities for each objective, and includes trigger events and end points. Monitoring activities include those of the Coleman Adaptive Management Program and the Upper Watershed projects. ***Trigger events*** are circumstances specific to the Restoration Project (with consideration given to other adaptive management activities in the watershed) that indicate an action, or adaptive response, should be taken because an ecosystem response controlled by the Restoration Project did not occur as anticipated. If an objective is not being met due to the Restoration Project and a trigger event occurs, then an adaptive ***response*** would be required, which could involve further diagnostic studies or modification of the hydroelectric project facilities or operations, or changes to natural features of the Restoration Project Area, designed to bring the system closer to achieving the objective. All responses will have ***response evaluations*** and must be feasible, practical, reasonable, prudent, and acceptable to the local community, though this does not preclude potentially major modifications to project facilities or operations. However, each response has ***response limits*** that describe the absolute scope of actions that can be taken in response to a trigger event. ***End points*** are a goal and/or circumstance indicating that an objective has been attained and that monitoring and data assessment are no longer needed for that

objective. The Restoration Project will closely coordinate with other adaptive management programs in the watershed, including the CNFH-AMP, to facilitate a coordinated, adaptive decision making process for activities in the watershed that may be influencing or controlling attainment of specific ecosystem restoration objectives.



Conceptual Model 3. Restoration Project Implementation Model
(Source: April 2004 Draft AMP)

A4. Feasibility

The January 1999 Restoration Plan (Ward and Kier 1999) formed the foundation for entering into a long term agreement (1999 MOU) with PG&E for the restoration of anadromous fishery habitat in Battle Creek and its tributaries, and facilitate the goals of the Central Valley Project Improvement Act (CVPIA). Parties to the MOU include, in addition to PG&E, the NOAA Fisheries, Reclamation, the USFWS, and DFG. This participation by all of the key resource agencies in a signatory role along with PG&E is indicative of the widespread support for the Restoration Project and demonstrates that implementation is feasible.

Any proposed change to the Hydroelectric Project triggers the need for PG&E to seek a license amendment from FERC. In addition to the FERC license amendment process, the Restoration Project needs to be in compliance with both the National Environmental Policy Act (NEPA) (42 USC4321-4347) and the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] 21000 et seq.). The Restoration Project is also directed by several actions needed to implement the CALFED Ecosystem Restoration Program (ERP) and contribute to the Multi Species Conservation Plan through an adaptive management process.

Restoration Project alternatives consist of a "No Action" alternative and action alternatives. Action alternatives consist of various combinations of dam removals, fish screen improvements, fish ladder improvements, and increased stream flow below dams. The alternatives have been analyzed in a draft NEPA/CEQA document; the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), dated July 2003, and supplemental/revised draft NEPA/CEQA document; the Draft Supplemental EIS/Revised EIR, dated March 2005.

The proposed Restoration Project is currently undergoing the finalization of the EIS/EIR, development of environmental permits, finalization of design plans and specifications and pursuance of a FERC License Amendment. Table 5 illustrates a feasible schedule to begin construction of the Restoration Project in 2006. (Also refer to Table 6: 'Proposed Work Schedule' within Section A8 of this proposal.)

Table 5. March 2005 Draft Schedule of Key Items

Date	Action
July 2003	• Draft EIS/EIR Released • Draft FERC License Amendment Application Complete
Sept. 2003	CALFED Technical Review Panel Report
Oct. 2003	Draft EIS/EIR Public Comment Period Ends
Jan. 2004	• Initial Response to Technical Review Panel Report • CNFH Science Report
March 2004	Public Workshop Comparing the Proposed Action (5 Dam Removal Alternative) to an 8 Dam Removal Scenario
April 2004	• ASIP Completed, Section 7 Consultation begins • Final Response to Technical Review Panel Report (including Revised Draft AMP)
November 2004	ASIP revised

Date	Action
May 2004	Submittal of PSP Proposal for supplemental funding for the Restoration Project
March 2005	Submittal of revisions to the PSP for supplemental funding for the Restoration Project
March/April 2005	ASIP Addendum complete
July 2005	• Final EIS/EIR complete • USFWS and NOAA Fisheries BO's completed
August 2005	• CEQA Findings and NEPA Record of Decision (ROD) • Issuance of Clean Water Act (CWA) 404 Permit and CWA 401 Water Quality Certification
Aug. 11, 2005	CBDA Meeting: Board considers the Resolution to make a Funding Decision for the Restoration Project
After Aug. 11, 2005	Final FERC License Amendment completed and submitted to FERC
Oct. 2005 – Feb. 2006	FERC Determination
Oct. 2005 – Feb. 2006	Potential Clearing/Hazing Contracts Awarded
February 2006	Wildcat Dam and Canal Removal Contract Awarded
April 2006	North Fork Fish Screens and Ladders and Hydropower Facility Contracts Awarded
June 2008	South Dam, South Canal and Soap Creek Dam Removals Contract Awarded
July 2009	Construction Complete

A5. Performance Measures

A full monitoring plan is included in Adaptive Management Plan, which is located on the California Bay Delta Authority website: http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemBattleCreek.shtml, and the Battle Creek Restoration Project Website: http://www.usbr.gov/mp/battlecreek/. This plan includes, as discussed in 'Section A3. Approach' of this proposal, a full discussion of monitoring and data assessment methods, monitoring timelines, trigger events defining performance measures, potential response measures and limits, response evaluations, and end points.

Primary monitoring responsibilities associated with the proposed Restoration Project lie with PG&E, USFWS, and DFG. Details of specific monitoring actions are more fully delineated in separate CALFED proposals by USFWS. The monitoring included in this proposal is being incorporated into existing monitoring programs being conducted by the USFWS. Additional monitoring may be conducted by DFG. Some monitoring aspects may also be conducted under the auspices of the Battle Creek Watershed Conservancy.

A6. Data Handling and Storage

It will be the responsibility of any Party collecting and/or funding the collection of data as part of adaptive management monitoring to ensure that the following data management protocols are carried out. All data collected as part of Adaptive Management monitoring will be:

- Collected according to scientifically sound protocols developed by the agencies collecting or funding data collection;
- Collected following AMP protocols for data collection on private lands;

- Validated using scientifically sound quality assurance and quality control procedures before being released to the public or other agencies, or used in decision making;
- Include information consistent with CMARP, U.S. Environmental Protection Agency (EPA), or other contemporary standards;
- Stored and/or disseminated in an appropriate agency information system that is publicly accessible which provides for public distribution of information; and
- Transmitted to the Battle Creek Watershed Conservancy (BCWC) for storage and/or dissemination in an information system operated and maintained by the BCWC and will include metadata and narrative descriptions of the goals, objectives, methodology of data collection, and a description of the limitations on the use of the data.
- Transmitted to the CNFH Adaptive Management Program to assist in their adaptive management evaluations.

Contemporary CMARP and EPA data collection standards encourage the collection of the following information: date; time; station code; GPS (global positioning system) coordinates; species; length; length criteria; marks or tags; life stage; plus count; live/dead; effort information; trapping efficiency; basic water quality data such as temperature, turbidity, flow; and metadata. Adaptive Management data collection and storage standards may change to meet any changes in contemporary standards.

A7. Expected Products/Outcomes

Ultimately, the expected outcome of the proposed Restoration Project is restoration of listed Chinook salmon populations and steelhead. The principle product includes the completion of the physical features of the proposed Restoration Project. Associated documents to be prepared include:

- Design/Construction Documentation, including Design Summary Report, As-built drawings of all physical structures, construction monitoring documentation, Designer's Operating Criteria Report and Facilities Monitoring Plan
- Environmental Documentation, including the EIS/EIR, an Action Specific Implementation Plan (ASIP) and Environmental Permits
- Adaptive Management Plan, Adaptive Management Monitoring Documentation and close coordination with both the CNFH-AMP and Upper Watershed Adaptive Management Programs.

A8. Work Schedule

Construction of the Restoration Project is anticipated to begin in Spring 2006 and end by Summer 2009 (also refer Table 5: 'March 2005 Draft Schedule of Key Items' in Section A4 of this proposal). Table 6 shows the proposed work schedule at each site. The construction schedule is governed by the following assumptions:

- Supplemental funding is provided.
- Environmental documentation is completed, and environmental permits are obtained.
- The FERC License Amendment is obtained.
- Construction is sequenced to minimize power outages.
- Construction is sequenced to attain benefits for aquatic resources as early as possible and to minimize adverse impacts associated with construction.
- Construction is sequenced to minimize streamflow diversion requirements at each dam site during dam removal and for other instream construction.

Table 6. Proposed Work Schedule

Site	Estimated Start Date	Estimated Finish Date
Wildcat Diversion Dam & Wildcat Canal	July 2006	November 2006
North Battle Creek Feeder Diversion Dam	May 2006	August 2007
Eagle Canyon Diversion Dam & Eagle Canyon Canal	May 2006	August 2007
Inskip Diversion Dam/South Powerhouse	May 2006	January 2009
Coleman Diversion Dam/Inskip Powerhouse Bypass	May 2006	July 2009
Lower Ripley Creek Diversion Dam	June 2007	June 2007
Soap Creek Feeder Diversion Dam	October 2008	November 2008
South Diversion Dam and South Canal	August 2008	January 2009

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

B1. ERP, Science Program and CVPIA Priorities

Strategic goals identified in the "Ecosystem Restoration Program Draft Stage 1 Implementation Plan – August 2001" which apply to the proposed Restoration Project include:

- Goal 1 – At-Risk Species
- Goal 2 – Ecosystem Processes and Biotic Communities
- Goal 4 – Habitats

Restoration priorities for the Sacramento Region identified in the Draft Stage 1 Implementation Plan which apply to the Restoration Project include:

- Develop and implement habitat management and restoration actions in collaboration with local groups
- Restore fish habitat and fish passage particularly for spring-run Chinook salmon and steelhead trout and conduct passage studies
- Conduct adaptive management experiments in regard to natural and modified flow regimes to promote ecosystem functions or otherwise support restoration actions
- Develop conceptual models to support restoration of river, stream, and riparian habitat.

The CVPIA Anadromous Fish Restoration Program (AFRP) has identified 12 actions that would help restore anadromous fish to Battle Creek, including increasing instream flows past PG&E's hydropower diversions and installing effective fish screens and ladders. Of the twelve proposed actions listed in the AFRP, three are elements of the proposed Restoration Project.

B2. Relationship to Other Ecosystem Restoration Projects

Table 7 identifies restoration programs, directives and activities related to the Restoration Project. A detailed discussion of many of these items is found in the Draft Adaptive Management Plan, which is located on the California Bay Delta Authority website: http://calwater.ca.gov/Programs/EcosystemRestoration/EcosystemBattleCreek.shtml, and the Battle Creek Restoration Project Website: http://www.usbr.gov/mp/battlecreek/.

Specific Restoration Project Related Actions Associated with this Proposal:

1. Interim Flows: A current interim flow agreement with PG&E (No. 03-WC-20-2554, dated September 30, 2003) is in effect until December 2005. CALFED funding was approved for this agreement in 2003 and, in March 2004, an additional $1.5 M was approved through the Ecosystem Restoration Subcommittee Amendments Requests Process. However, the additional $1.5 M was approved by the Amendments Committee to be taken out of the CALFED Project No. 1999-B01 Restoration Project ($ 28 M) funds. Therefore the funding for the original 1999 Restoration Project proposal tasks decreased to $26.5 M. In addition, because instream construction work is now not planned to begin until 2006 at Wildcat and Eagle Canyon Diversion Dams and until 2009 at Coleman Diversion Dam, a new interim instream flow agreement will be developed, and it is estimated that $1.5 M of additional interim instream flow funding will be needed.

2. Coleman National Fish Hatchery Adaptive Management Plan (CNFH-AMP) Development Proposal: A proposal was developed in response to the January 2004 CNFH Science Panel Report and subsequent February 2004 Workshop, as well as in response to the September 2003 Restoration Project Technical Review Panel Report. (This proposal in Attachment A)

3. CNFH-AMP Diagnostic Studies: A proposal was developed in response to the January 2004 CNFH Science Panel Report and subsequent February 2004 Workshop, as well as in response to the September 2003 Restoration Project Technical Review Panel Report. (This proposal in Attachment B)

B3. Requests for Next-Phase Funding

While not specifically requesting next phase funding, this proposal does request supplemental funding to complete the Restoration Project.

Table 7. Relationship to Other Ecosystem Programs, Directives and Activities

Non-Project Restoration Programs in Battle Creek
Greater Battle Creek Watershed Strategy
Conservation easements and conservation water rights
Proposed fisheries management plan for the upper Sacramento River and tributaries
Sacramento Corridor Habitat Restoration Assessment
Coleman National Fish Hatchery, water-supply intake modifications
Proposed Coleman Powerhouse tailrace barrier construction
Modifications to the Coleman National Fish Hatchery Barrier Weir and Associated Fish Ladders
Coleman National Fish Hatchery Biological Assessment and Associated Biological Opinion
Coleman National Fish Hatchery Adaptive Management Plan
Planning for recovery of ESA-listed species in Battle Creek
Regional Restoration Programs and Directives
CALFED Ecosystem Restoration Program.
CALFED Science Program
Central Valley Project Improvement Act
Anadromous Fish Restoration Program
Comprehensive Assessment and Monitoring Program
Recovery plans for threatened or endangered salmonids
Central Valley Salmon and Steelhead Restoration and Enhancement Plan
Upper Sacramento River Fisheries and Riparian Habitat Management Plan
Restoring Central Valley Streams- A Plan for Action
Steelhead Restoration and Management Plan for California.
Delta and Sacramento River operations and monitoring
Reference Watersheds
U.S. Bureau of Land Management
U.S. Forest Service
Sport and commercial fisheries management
Battle Creek Watershed Conservancy
Local community participation
Sediment quality monitoring
Watershed assessment
Water temperature and climate monitoring
Data management and dissemination
Non-Project Restoration Emergencies
For example, hazardous spills/toxic leaks

B4. Previous Recipients of CALFED Program or CVPIA funding

The Restoration Project was initially funded under CALFED Project No. 1999-B01 ($28 million). This PSP requests supplemental funding to complete the Restoration Project.

Two previous interim flow agreements with PG&E for augmenting flows on Battle Creek have previously been funded under the CVPIA water acquisition program. The first agreement with PG&E (No. 6-07-20-W1379), dated October 4, 1996 was effective until November 1998. The second agreement (No. 8-07-20-W1528), dated November 17, 1998, expired in February 2001.

A current interim flow agreement with PG&E (No. 03-WC-20-2554, dated September 30, 2003) is in effect until December 2005. CALFED funding was approved for this agreement in 2003 and, in March 2004, an additional $1.5 M was approved through the Ecosystem Restoration Subcommittee Amendments Requests Process. The additional $1.5 M was approved by the Amendments Committee to be taken out of the CALFED Project No. 1999-B01 Restoration Project ($28 M) funds.

B5. System-wide Ecosystem Benefits

The local Battle Creek Watershed Conservancy (BCWC) is currently carrying out watershed studies for the Battle Creek Watershed. This work includes the development of watershed management strategies. This work is examining, among other things, land use practices that may ultimately affect fishery restoration projects in the watershed. These independent efforts by BCWC will facilitate successful implementation of this Restoration Project.

B6. Additional Information for Proposals Containing Land Acquisition

The MOU obligates PG&E in the role of land acquisition. Where feasible, existing PG&E rights-of-way will be utilized for project implementation. Specific agreements with individual landowners may also be needed. Any needed temporary construction agreements will be developed by both Reclamation and PG&E with cooperative willing individual landowners.

C. Qualifications

Key agency roles and personnel are described below. Individual biographical sketches can be provided upon request.

U.S. Bureau of Reclamation
Reclamation is responsible for activities to implement the Restoration Project. This includes design data collection, design, permitting, construction, contract administration and environmental compliance. Reclamation is the Federal lead agency for NEPA compliance. Key personnel include:

Mary Marshall, Project Manager and Environmental Team Lead, Mid-Pacific (MP) Regional Office
Tom Hepler, Design Team Leader, Technical Services Center
Jim Goodwin, Design Team Leader, MP Regional Office
Richard Welsh, Project Construction Engineer, MP Construction Office

U.S. Fish and Wildlife Service
The Fish and Wildlife Service has responsibilities associated with ESA consultation processes, development of environmental compliance documents, long-term monitoring, and participation in the development of the Adaptive Management Plan. Key personnel include:

Jim Smith, Chairperson of Adaptive Management Policy Team, Red Bluff Office
Bart Prose, Biologist, Ecologic Services, Sacramento Office
Matt Brown, Biologist, Red Bluff Office
Scott Hamelberg, Manager of Coleman National Fish Hatchery (located near Anderson)

NOAA Fisheries
NOAA Fisheries has responsibilities associated with ESA consultation processes, and provides technical engineering support to ensure facilities are designed in a manner to fully meet all regulatory requirements. Key personal include:

Steve Thomas, Fish Structure Engineer, Santa Rosa Office
Mike Tucker, Biologist, ESA Compliance, Sacramento Office

California Department of Water Resources
DWR has lead responsibility, under contract to Reclamation, for the designs of the fish screen and ladder facilities. Staffing from the Sacramento Division of Engineering and the Northern District participate in the design of these features. Key personnel include:

Cosme Diaz, Program Manager
Lucas Munoz, Civil Design Leader, Inskip Diversion Fish Screen and Ladder
Jeanne Schallberger, Civil Design Leader, North Battle Creek Feeder Fish Screen and Ladder
Timothy Talbert, Civil Design Leader, Eagle Canyon Fish Screen and Ladder
Soheil Loghmanpour, Mechanical Design Leader, All Screens and Ladders

California Department of Fish and Game
DFG has the lead responsibility for dedication of water rights associated at dam removal locations. DFG also provides engineering technical support and peer review in the development of fish passage facilities and participates in the development of the Adaptive Management Plan. Key personnel include:

Harry Rectenwald, Environmental Scientist, Chairperson of Adaptive Management Technical Team, Redding Office
Steve Turek, Environmental Manager, Redding Office
Robert Hughes, Fish Structure Engineer, Sacramento Office
Mike Berry, Senior Fishery Biologist

State Water Resources Control Board
The State Water Resources Control Board, located in Sacramento, is the State Lead Agency for CEQA compliance and for issuance of the CWA Section 401 Water Quality Certification. Key contact:

Jim Canaday, Environmental Scientist, Sacramento

Pacific Gas & Electric Company
As owner/operator of the Battle Creek Hydroelectric Project, PG&E has a full range of responsibilities in the implementation of this Restoration Project. PG&E has the lead responsibility in the FERC license amendment process. Key personnel include:

Angela Risdon, Project Manager, San Francisco Office
Chip Stalica, Operations Manager of PG&E Office in Manton
Gene Geary, Biologist, San Ramon Office
Curtis Steitz, Biologist, San Ramon Office

Federal Energy Regulatory Commission
FERC is a Federal cooperating agency for NEPA compliance. FERC will make the determination on the request for a Battle Creek Hydroelectric Project license amendment. Key contact:

Thomas J. (TJ) LoVullo, Hydropower Team Leader, Washington D.C. Office

D. Cost

D1. Budget

The total request for funding under this Proposal is $57.55 M to $ 64.05 M to supplement the $28 M funding approved by CALFED in 1999 for the Restoration Project.

The Budget Summary and Budget Justification Form provide a complete description of and justification for cost increases.

D2. Cost-Sharing

A complete delineation of cost-sharing responsibilities and other for the Restoration Project Proposed Action is found in the June 1999 MOU (MOU 1999). In summary, Table 3 of the January 1999 Agreement In Principle (Attachment to the MOU) illustrates the cost sharing specifics. As noted in this table, PG&E's total contribution is $20.55 M (which includes costs for environmental (fisheries) monitoring, net present value of O&M impacts, cost of foregone power during construction and net present value of annual foregone power, and a Third Party Donor (The Packard Foundation) is contributing $ 3M for an adaptive management fund.

In addition, there is potential for cost-sharing by the Iron Mountain Mine Council.

E. Local Involvement

Members of the Battle Creek Watershed Conservancy and the Battle Creek Working Group meet on a regular basis to discuss technical and policy issues relating to restoration in the watershed. Numerous working sessions have addressed upstream watershed concerns, hatchery and natural fish interaction, and other environmental and Endangered Species Act regulatory concerns and assurances. As watershed issues and issues specific to the Restoration Project have evolved, the importance of a total watershed and ecosystem approach to dealing with resource issues as well as the importance of fully vested stakeholder participation in resource management decisions has been recognized.

Compatibility of CNFH operations with Battle Creek watershed restoration is a major concern of stakeholders engaged in planning and implementing restoration activities in the Battle Creek watershed. The CALFED Science Program formed an independent Science Panel to address these and other technical questions from a science perspective. In January 2004, a Science Report was issued, followed by a Science Report Workshop in February 2004. Based on the ERP Selection Panel recommendation, issues identified by the Science Panel, have been addressed in the AMP for the Restoration Project. Restoration Project screen and ladders will be modified, as described in the Initial and Final Response to the September 2003 Technical Review Panel Report. In addition, as part of this Proposal, Attachments A and B contain proposals to develop a CNFH Adaptive Management Plan (CNFH-AMP), as well as perform diagnostics studies associated with the CNFH-AMP.

In their February 8, 2005 letter to Mr. Patrick Wright with the CBDA, the Battle Creek Watershed Conservancy (BCWC) indicates that Reclamation, USFWS, DFG and NOAA Fisheries have made significant steps regarding the four tasks (steelhead supplementation, restoration project objectives, recovery strategies and adaptive management at Coleman National Fishery Hatchery) that the BCWC considered necessary and sufficient to allow for their active support for the Restoration Project and which would avoid delays to project implementation that could arise if preparation of a comprehensive document was undertaken (BCWC 2005).

F. Compliance with Standard Terms and Conditions

In reference to the ERP 2002 Proposal Solicitation Attachments A and D, Reclamation takes exception to several of the standard terms and conditions outlined in Attachment D, however, will comply with applicable replacement terms negotiated with the Department of Water Resources and formalized in DWR 4247 (Rev. 9/95), Standard Clauses -- Contracts with the United States Bureau of Reclamation.

Reclamation further takes exception to Attachment D, Item 2. Payment Schedule and Item 3. Performance Retention, as it implies that payment for all work under the grant will be made on a reimbursable basis. Reclamation requires advances of funds in whole or part from non-Federal funding entities seeking services that do not fall within the rules and regulations promulgated in Office of Management and Budget Circular A-97.

G. Literature Cited

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ATTACHMENT A

COLEMAN NATIONAL FISH HATCHERY
ADAPTIVE MANAGEMENT PLAN
DEVELOPMENT PROPOSAL

Proposal to Facilitate and Develop an Adaptive Management Plan for Coleman National Fish Hatchery for consideration by Greater Battle Creek Watershed Working Group

Purpose

The purpose of this proposal is to request funds to facilitate the development of an adaptive management plan (AMP) for Coleman National Fish Hatchery (CNFH) in a process: a) which would be inclusive of responsible agencies and interested stakeholders, b) which would conform to the "goals and objectives" of Battle Creek Salmon and Steelhead Restoration Project and legally-mandated hatchery-specific goals and objectives, c) which would be reviewed by the California Bay-Delta Authority Science Panel on CNFH and other principal scientific bodies, and d) which would include the scoping and prioritization of diagnostic studies necessary for CNFH adaptive management. This CNFH-AMP would be developed to closely coordinate with the AMP developed for the Battle Creek Salmon and Steelhead Restoration Project so that salmon and steelhead restoration in Battle Creek and production of salmon and steelhead at CNFH would be adaptively managed through a coordinated process.

Background and Problem Statement

On February 5, 2004, the California Bay-Delta Authority (CBDA) Science Program held a public meeting to report on the findings of a Science Panel review of the effects of CNFH on the recovery of anadromous salmonids in the Battle Creek Watershed. The findings were provided in a report entitled *Compatibility of Coleman National Fish Hatchery Operations and Restoration of Anadromous Salmonids in Battle Creek*. A key finding of this Science Panel was the need to implement adaptive management at CNFH in a manner which would support the Battle Creek Salmon and Steelhead Restoration Project (Restoration Project). The Science Panel stated that adaptive management on Battle Creek is essential and that the "adaptive process should be capable of changing management policies including those at CNFH."

The principal message of the Science Panel's findings, and the main reason that adaptive management is needed for CNFH, is that "scientific uncertainties" underlie all aspects of Battle Creek fisheries management, including the interactions between the Restoration Project and CNFH. Adaptive management is the best strategy for incorporating scientific uncertainty into decision making. While a thorough AMP has been developed for the Restoration Project, no such plan exists for CNFH. This proposal seeks to develop a CNFH-AMP. The CNFH-AMP will acknowledge, identify, study, and evaluate uncertainties regarding the operation of a large scale fish hatchery in a watershed being restored for natural salmonid populations. Results of monitoring and evaluation will be evaluated against goals and objectives of the CNFH-AMP. Improved understanding resulting from this formal adaptive management program may result in the development of alternative management strategies to better achieve goals and objectives of both CNFH and the Restoration Project.

Other programs recognize the need for adaptive management at CNFH. For example, staff from the U.S. Bureau of Reclamation (USBR), the agency responsible for

funding CNFH, and the U.S. Fish and Wildlife Service, CNFH operators, have publicly recognized the need for adaptive management at CNFH. Additionally, adaptive management plans are generally required for projects funded through CBDA. Adaptive management of the CNFH barrier weir and fish ladder modification project (funded through CBDA) could therefore be integrated into a comprehensive CNFH AMP. Finally, local support for adaptive management at CNFH has been expressed; for example, the Battle Creek Watershed Conservancy recently issued a call for the development of such a program.

USBR is the logical lead agency for this effort because: 1) it has the ultimate funding responsibility for the hatchery, 2) is the lead agency for the Restoration Project, for which purpose the CNFH-AMP is needed, and 3) because of a strong track record of funding and facilitating the development of adaptive management in Battle Creek.

Project Description and Expected Outcomes

USBR would facilitate the development of an adaptive management plan for CNFH in a process which would be inclusive of responsible agencies and interested stakeholders. The goal of the CNFH-AMP would be to monitor CNFH activities on Battle Creek and implement adaptive management, in coordination with the Restoration Project AMP, to ensure that CNFH activities are compatible with the objectives of the Restoration Project, in addition to legally-mandated hatchery-specific goals and objectives, including but not limited to those in the CBDA EIS.

The CNFH-AMP would be compatible with, and as rigorous as, the Restoration Project AMP and would be developed using a common framework and similar organization as that document. The CNFH-AMP would include, at a minimum: goals, objectives, conceptual models, uncertainties, monitoring and data assessment approaches, specification of focused studies, description of decision making process, funding prioritization, and all other elements of formal adaptive management. Adaptive management operating procedures would be well coordinated with those of the Restoration Project AMP.

The Restoration Project AMP recognizes the need for the development of a CNFH-AMP and anticipates that the two AMPs would "share findings on key uncertainties, coordinate study designs and preliminary findings, and provide mutual assistance on activities and other items of mutual interest. Technical Teams for the AMP and CNFH-AMP will participate in any additional technical and scientific reviews of the Restoration Project or CNFH and the results of the reviews will be applied to each of the adaptive management programs, including necessary adjustments to accommodate the findings relevant to the programs using a watershed approach."

Together, the Restoration Project AMP and the CNFH-AMP will form a cooperative framework for adaptive management in Battle Creek. However, the need to partition this framework into two AMPs remains due to legal constraints related to the focus of each document. The immediate focus of the Restoration Project AMP is the Battle Creek Hydroelectric Project, which is owned by Pacific Gas and Electric Company (PG&E) and is regulated by the Federal Energy Regulatory Commission. This plan deals with flow, water temperature, gravel transport, fish passage, and other aspects of the

hydroelectric project under the control of PG&E. The immediate focus of the CNFH-AMP would be Coleman National Fish Hatchery, which is funded by USBR and is guided by U.S. Fish and Wildlife Service policy and other state and federal laws. This plan would provide for monitoring and adaptive management of the operations and facilities of CNFH to ensure that these operations and facilities are compatible with the restoration of populations of salmon and steelhead in Battle Creek and the natural ecosystem processes on which these populations depend. To Battle Creek salmon and steelhead, however, such distinctions are artificial. Therefore, the USBR will build on its well founded Restoration Project AMP by crafting the CNFH-AMP to fill in the gaps (e.g. CNFH operations) and areas of overlap (e.g. lower Battle Creek) between the two plans and to establish processes that effectively coordinate adaptive management under both plans to the maximum extent feasible under law.

The USBR may hire a contractor to facilitate and develop the CNFH-AMP or may hire/assign agency staff to complete this work. If a contractor is hired, the contractor would demonstrate adequate technical capabilities and would demonstrate that no actual or perceived conflict of interest exists. The goal would be for USBR to develop the final CNFH-AMP within 18 months of receiving a funding commitment and developing a contract with CBDA.

A Technical Advisory Committee (TAC) would be established among members of the Greater Battle Creek Watershed Working Group (GBCWWG) to guide and assist the facilitation and development of the CNFH-AMP. This TAC would include technical representatives from USFWS, CDFG, NOAA Fisheries, and at least three non-agency members of the GBCWWG. The three responsible fisheries agencies would assist Reclamation or the contractor in development of the CNFH-AMP.

Principal scientific bodies would be asked to participate in the scoping and review of the CNFH-AMP. The CBDA Science Panel on CNFH would be asked to reconvene and provide peer review of the CNFH-AMP during key milestones of the document's development including scoping and administrative draft review. Monies to fund the participation of this Science Panel are included within this request. Also, the CBDA Ecosystem Restoration Program Science Panel and the California Advisory Committee on Salmon and Steelhead Trout would also be invited to provide peer review during scoping and administrative draft review. Additionally, all meetings of the TAC would be open to the public; scientists and lay persons interested in Battle Creek adaptive management would be encouraged to participate.

Diagnostic studies, those studies necessary to help advise between alternative adaptive management responses or monitoring approaches, were recommended or inferred in the Science Panel's report. A preliminary list of diagnostic studies primarily excerpted from the Science Panel Report is included within this response packet under separate cover. While adaptive management of CNFH can be developed and implementation can be started prior to completion of all these diagnostic studies, the Science Panel makes clear that adaptive management will be more successful if uncertainties underlying these diagnostic studies were resolved as soon as possible. Therefore, a list of these studies would be evaluated by the USBR and TAC as part of the CNFH-AMP development process and would be prioritized, shortened, and/or added to

in order to meet the goals and objectives of the final CNFH-AMP and the Restoration Project.

Public involvement is an important component of adaptive management and will be encouraged during all phases of CNFH-AMP development. While public input can occur at any phase of the process, public involvement will be specifically encouraged in several ways:

- Regular reports will be provided to the Greater Battle Creek Watershed Working Group during the regular meetings of that forum;
- Contact with landowners and Battle Creek watershed residents will be coordinated through the Battle Creek Watershed Conservancy;
- The public will be invited to participate in three public meetings and to provide comment on the draft plan. The public's vision for adaptive management at CNFH will be solicited at an initial scoping meeting. A public review draft will be presented to the public during a 30-day comment period of this draft. The final CNFH-AMP will be presented and explained to the public once it has been completed; and
- Public participation in the implementation of the CNFH-AMP will be designed into the plan.

Goals and Objectives

The goal of the CNFH-AMP would be to monitor CNFH activities on Battle Creek and implement adaptive management, in coordination with the Restoration Project AMP, to ensure that CNFH activities are compatible with the objectives of the Restoration Project, in addition to legally-mandated hatchery-specific goals and objectives, including but not limited to those in the CBDA EIS.

The objectives of the Restoration Project address restoration and enhancement of anadromous fish habitat in Battle Creek to restore self-sustaining populations of fish species, including four separate runs of Chinook salmon and steelhead, and to implement a long-term adaptive management plan with dedicated funding sources to ensure the continued success of restoration efforts under this partnership. See page 2-4 of the Draft Environmental Impact Statement/Environmental Impact Report for a complete set of these objectives.

General goals for CNFH are characterized in the Service's Fisheries Strategic Vision. The general vision of all U.S. Fish and Wildlife Service fisheries activities is "….working with partners to restore and maintain fish and other aquatic resources at self-sustaining levels and to support Federal mitigation programs for the benefit of the American public."

Specific Goals from the Strategic Vision that pertain to CNFH include: self-sustaining populations of native fish and other aquatic resources that maintain species diversity provide recreational opportunities for the American public and meet the needs of tribal communities; and to meet the federal government responsibilities to mitigate for the impacts of federal water projects, including restoring habitat and/or providing fish and associated technical support to compensate for lost fishing opportunities.

Other station specific Goals and Objectives for CNFH are provided in the CNFH Station Development plan (the implementation of which is authorized under CVPIA), and the current Biological Assessment developed by the Service for operational compliance under ESA.

Some CBDA goals pertaining to CNFH and Battle Creek include: reduce or eliminate competition between hatchery salmonids in the upper Sacramento River and releases from the CNFH; direct harvest pressure from wild steelhead to steelhead produced at CNFH; increase naturally spawning steelhead population number and sizes sufficient to maintain population resiliency and to allow meta-population persistence through periods of adverse climatic and ecological conditions; improve the distributions of wild salmon and steelhead stocks through improvements to operation of Coleman National Fish Hatchery; reduce or eliminate conflicts in Battle Creek that require excluding anadromous fish from the upper section to protect the Coleman National Fish Hatchery water supply; and protect naturally produced salmon and steelhead by minimizing the likelihood that hatchery-reared salmon and steelhead produced in the Coleman National Fish Hatchery will stray into non-natal streams. See CalFed Bay-Delta Program Ecosystem Restoration Program Plan for a complete set of these goals and objectives. The complete set of these goals, not just these summaries, will be included as the goals and objectives of the CNFH-AMP.

Work to Be Performed

Task 1. Develop the CNFH-AMP including a) scoping, b) an administrative draft, c) public review draft, and d) final draft plan within 18 months of initiation of contract.

Task 2. Facilitate scientific review of CNFH-AMP development. Reconvene the CBDA Science Panel on CNFH to meet with and advise the TAC at two phases of the CNFH-AMP development including: a) scoping and b) administrative draft review. Invite the participation of the CBDA Ecosystem Restoration Program Science Panel and the California Advisory Committee on Salmon and Steelhead Trout in a) scoping and b) administrative draft review.

Task 3. Convene a Technical Advisory Committee which would include technical representatives from USFWS, CDFG, NOAA Fisheries and at least three non-agency members of the GBCWWG.

Task 4. Facilitate up to 30 meetings (approximately every 2 weeks, at least initially) of the TAC to assist the USBR or contractor develop the CNFH-AMP.

Task 5. Facilitate at least three public meetings to solicit and receive public comment on CNFH-AMP scoping, public draft, and final CNFH-AMP.

Task 6. Perform community outreach related to the development of the CNFH-AMP.

Task 7. Report on CNFH-AMP to GBCWWG on regular basis and provide written progress reports to CBDA.

Schedule Of Deliverables

Task No. / Deliverables	Deliverable Schedule
TASK 1:Develop CNFH-AMP	
1a. Scoping	Within six weeks of contract initiation
1b. Administrative Outline of CNFH-AMP	Within 3 months of contract initiation
1b. Administrative Draft CNFH-AMP	14 months after contract initiation
1c. Public Review Draft CNFH-AMP	16 months after contract initiation
1d. Final Draft CNFH-AMP	18 months after contract initiation
TASK 2:Facilitate Scientific Review of CNFH-AMP Development	
2a. CNFH Science Panel and other principal scientific bodies (i.e. ERP Science Panel and CACSST) invited to participate in initial scoping meeting	Agreements established with members of CNFH Science Panel within 2 weeks of contract initiation; Invite CNFH Science Panel and other principal scientific bodies to scoping meeting within 4 weeks of contract initiation
2b. CNFH Science Panel to participate in initial scoping meeting	Within 6 weeks of contract initiation
2c. CNFH Science Panel to provide scoping comments	Within 3 months of contract initiation
2d. CNFH Science Panel to issue comments on administrative draft	Within 4 weeks of completion of administrative draft
2e. CNFH Science Panel to issue final comments on public review draft	Within 4 weeks of completion of public review draft
TASK 3:Technical Advisory Committee	
3a. Solicit and receive commitments of support from agency and non-agency members of the TAC.	Within 2 weeks of contract initiation.
TASK 4:Facilitation/Coordination of CNFH-AMP Development with Technical Advisory Committee	
4a. Convene up to 30 meetings of the TAC to develop CNFH-AMP	Hold first meeting within 4 weeks of contract initiation to plan initial scoping meeting; hold other meetings as needed.
TASK 5:Public Meetings	
5a. Convene initial scoping meeting.	Within 6 weeks of contract initiation
5b. Convene Public draft review meeting.	Allow for a 30 day public comment period on public review draft. Present public review draft of CNFH-AMP to public 16 months after contract initiation during this comment period.
5c. Present final CNFH-AMP to public.	Present the final CNFH-AMP to public 18 months after contract initiation.
TASK 6:Community Outreach	
6a. Issue public service announcements for each of three public meetings.	At least 2 weeks in advance of public meetings.
6b. Post copies of CNFH-AMP drafts and final plan, and development materials on USBR web site	Within 1 week of completion of each draft; as needed for development materials such as supporting documents, data, and models.
6c. Notify local landowners of public meetings and plan development by coordinating with Battle Creek Watershed Conservancy.	At least 2 weeks in advance of public meetings. Within 1 week of completion of each draft; as needed for development materials such as supporting documents, data, and models.
TASK 7:Reporting / Administration	
7a. Attend and report to Greater Battle Creek	As scheduled by GBCWWG

Watershed Working Group at regular GBCWWG meetings	
7b. Provide monthly progress reports to CBDA via monthly Ecosystem Restoration Subcommittee meeting.	As scheduled by Ecosystem Restoration Subcommittee

Budget

Task No. Deliverables	**Estimated Cost** (*see "Budget Notes" for rationale)
TASK 1: Develop CNFH-AMP	$175,000
TASK 2: CBDA Science Panel on CNFH	$45,000
TASK 3: Establish Technical Advisory Committee	$0.00
TASK 4: Facilitation/Coordination	$0.00
TASK 5: Public Meetings	$10,000
TASK 6: Community Outreach	$10,000
TASK 7: Reporting / Administration	$0.00
TOTAL	$240,000

Budget Notes

- Task 1 budget is based on the cost of development of Restoration Project AMP by USBR (approximately $125,000). The Restoration Project AMP cost was increase in this proposal to account for inflation and the possible need to retain specialized experts on genetics or other hatchery topics.
- Task 2 budget is based on the labor and travel costs (approximately $41,000) associated with the Science Panel that reviewed CNFH operations in 2003.

ATTACHMENT B

COLEMAN NATIONAL FISH HATCHERY
ADAPTIVE MANAGEMENT PLAN
DIAGNOSTIC STUDIES
PROPOSAL

Proposal Requesting Funding for the Implementation of Diagnostic Studies of the Effects of Coleman National Fish Hatchery on the Battle Creek Salmon and Steelhead Restoration Project

Introduction

The California Bay-Delta Authority (CBDA) has been asked, in a separate request, to fund the Battle Creek Salmon and Steelhead Restoration Project (Restoration Project), a major effort to provide drought-proof habitat for several anadromous species, habitat not otherwise present in the Central Valley river system. In the seven years that the proposal for this project has been under development the agencies and stakeholders, acting jointly as the Battle Creek Working Group, and with the help of the CBDA-funded Science Panel, have identified the critical elements required to minimize the known risks to the success of the project. These risks have been addressed through the design of the Restoration Project, through the provision of an adaptive management program for the Restoration Project (including funding for implementation of the AMP), and through a request for funds to develop an adaptive management program for the Coleman National Fish Hatchery (CNFH). This proposal requests funding for unfunded critical element identified by the Science Panel–support for the diagnostic studies required to assess the character and extent of any potential adverse impacts of Coleman National Fish Hatchery upon the success of the Restoration Project.

Purpose

The purpose of this proposal is to fund up to $1 million of diagnostic studies of the potential effects of CNFH on the Battle Creek Salmon and Steelhead Restoration Project. Under a separate proposal, U.S. Bureau of Reclamation will develop an adaptive management plan (CNFH-AMP) for CNFH. This plan development, scheduled to be completed in early 2007, will also include the scoping and prioritization of diagnostic studies necessary for CNFH adaptive management. This proposal seeks to secure monies from the 2005-2007 CBDA funding cycle to implement those studies necessary to reduce scientific uncertainty regarding if/how CNFH operations will be compatible with the Restoration Project. No money is being requested to implement adaptive management responses. No monies would be spent under this proposal until a list of diagnostic studies are prioritized per the CNFH-AMP process (described in separate proposal) and until specific study plans are developed and reviewed by CBDA.

Background and Problem Statement

The expertise and financial resources of many federal and state agencies and other stakeholders have been brought to bear, over a period of many years, upon the problems presented by the decline of anadromous fish in the Central Valley of California. Issues related to water use, water quality, diversion screening, fish passage, fish genetics, and fish habitat have been addressed through regulation, environmental restoration, fish supplementation, dam modifications, and other programs.

As a result of these programs there is hope for recovery of some species in normal years. However, it was recognized early on that the Sacramento-San Joaquin River

system presently lacks any cold-water refuges for anadromous fish which would allow continued species survival in the three driest years of every century.

The Battle Creek Salmon and Steelhead Restoration Project was planned in response to this recognition. Battle Creek, thanks to its large cold springs, has the has the only anadromous habitat remaining in the Sacramento River system which can furnish adequate amounts of low-temperature water to permit the survival of certain species in these driest years of each century.

The Restoration Project proposes to restore the habitat along 42 miles of Battle Creek, by increasing flows and providing for fish passage at hydropower facilities. Beside the presence of the hydropower facilities on the creek and effects of hydropower operations, the habitat along Battle Creek is otherwise relatively undisturbed except for the presence of CNFH, which was established to mitigate for the loss of habitat caused by the building of Shasta Dam. This large hatchery has many potential impacts upon Battle Creek, including water use, water quality issues, fish genetic issues, fish predation, and the operation of a barrier weir at the hatchery. The CBDA sponsored a Science Panel to review these issues in response to concerns of many stakeholders in the Restoration Project that the presence of the hatchery was a potential risk to the success of the Project.

On February 5, 2004, the CBDA Science Program held a public meeting to report on the findings of a Science Panel review of the effects of CNFH on the recovery of anadromous salmonids in the Battle Creek Watershed. The findings were provided in a 65-page report entitled *Compatibility of Coleman National Fish Hatchery Operations and Restoration of Anadromous Salmonids in Battle Creek*. A key finding of this Science Panel was the need to implement adaptive management at CNFH in a manner which would support the Battle Creek Salmon and Steelhead Restoration Project (Restoration Project). The Science Panel stated that "operation of CNFH may pose significant risk to recovery of anadromous salmonids in Battle Creek," adaptive management was essential, and that the "adaptive process should be capable of changing management policies including those at CNFH."

The principal message of the Science Panel's findings, and the main reason that adaptive management is needed for CNFH, is that "scientific uncertainties" underlie all aspects of Battle Creek fisheries management, particularly the interactions between the Restoration Project and CNFH. Adaptive management is the best strategy for incorporating scientific uncertainty into decision making. Finally, adaptive management is often crucial, as it is in Battle Creek, to reassure the public, resource agencies, and stakeholders that future actions will take place to address existing uncertainties.

While a thorough AMP has been developed for the Restoration Project, no such plan exists for CNFH. Therefore, the USBR has requested funds (under a separate proposal) to facilitate the development a CNFH-AMP.

While the CNFH Science Panel recognized that "operation of CNFH may pose significant risk to recovery of anadromous salmonids in Battle Creek," they were unable to define all of CNFH's risks, or to prioritize the risks they were able to identify, because of a general lack of information and a high degree of scientific uncertainty. None-the-less, they recommended that the uncertainties identified in their report be incorporated in to adaptive management and they presented a long list of studies and uncertainties that

need to be rectified before potential CNFH risks to Battle Creek fish populations could be identified and negated. This list of studies taken from the CNFH Science Panel report forms the basis for this proposal.

Adequate funding for monitoring is a critical component of adaptive management. For example, in October 2003, the CALFED Bay-Delta Ecosystem Restoration Program (ERP) Selection Panel issued a report that condemned an earlier version of the Adaptive Management Plan (AMP) for the Restoration Project in large part because funding for monitoring and diagnostic studies was inadequate. The Selection Panel stated that while "*funds dedicated for all future monitoring of both implementation and physical and biological responses for the project total only $1,000,000*" this lack of funds is "*one of the most fundamental deficiencies in the Battle Creek Restoration Project.*"

The Resource Agencies and Pacific Gas and Electric Company similarly recognized the need for adequate funding for studies in the Memorandum of Understanding for the Restoration Project. The MOU states, "*The objectives of the Restoration Project are (1) the restoration of self-sustaining populations of Chinook salmon and steelhead and their habitat in the Battle Creek watershed, . . . implementation of a long-term AMP with dedicated funding sources to ensure the continued success of restoration efforts.*" In the Environmental Impact Statement for the Restoration Project, the agencies (and public) have similarly recognized the need for "dedicated funding sources" for adaptive management studies.

Finally, local community support for the Restoration Project remains contingent, at this point, on adequate funding of adaptive management at CNFH and the continued development of the CNFH-AMP through an open process. The Battle Creek Watershed Conservancy has issued a request to the Resource Agencies specifying their commitment to the findings of the CNFH Science Panel that calls for "adaptive management at CNFH" and stating that a "hatchery adaptive management fund" must be established to fund, at a minimum, the most critical diagnostic studies specified by the CNFH Science Panel. The Conservancy feels that, without this minimum obligation, there are inadequate assurances that CNFH adaptive management will be successful. These doubts logically lead to doubts regarding the likelihood of success for the entire Restoration Project.

Fortunately, the revised USBR request (under separate cover) for funding for Restoration Project adaptive management responded to the Selection Panel report and now includes more appropriately levels of funding for monitoring. The Restoration Project AMP also responded to the Selection Panel's request for "prioritization" of monitoring funding by designating three tiers of studies from Tier I (critical) to Tier III (opportunistic). The revised 2004 CBDA grant cycle request by USBR reflects this tiering and includes requests for approximately $3.36 million to fund studies in all three tiers during the 2005 to 2007 time period.

In contrast, even the most critical diagnostic studies pertaining to the compatibility of CNFH and the Restoration Project remain unfunded, although it is likely that some of the uncertainties resulting from CNFH operations would rank in the highest priority tier of the CNFH-AMP, if similarly ranked. While it is true that the diagnostic

studies pertaining to CNFH operations are presently unranked and not scoped, it is stands to reason that funding should be allocated for the most critical of these uncertainties.

Project Description and Expected Outcomes

USBR will facilitate the development of an adaptive management plan for CNFH (proposed under separate cover) and will include the scoping and prioritization of diagnostic studies necessary for CNFH adaptive management. Table 1 provides a preliminary and non-prioritized list of studies, analyses, or evaluations that may be funded through this proposal.

By early 2007, the USBR will have completed the CNFH-AMP. During this process, and potentially much earlier than 2006, the Technical Advisory Committee that will oversee the development of the CNFH-AMP will have identified the key scientific uncertainties, defined the priority diagnostic studies, and developed study plans for the priority studies. Because some of these studies may be crucial for implementation of adaptive management at CNFH, if not for the completion of the CNFH-AMP document, some of these priority studies may need to be launched prior to the next CBDA funding cycle.

USBR asks CBDA to include $1 million for the funding of diagnostic studies within the revised budget for the Restoration Project. These diagnostic studies would elucidate scientific uncertainties regarding CNFH compatibility with the Restoration Project. Disbursement of these funds by CBDA would be contingent on USBR reaching contractual milestones. These milestones would be reached when a) USBR completes a list of prioritized diagnostic studies, b) study plans for the most important studies have been developed, and c) study plans have been submitted to CBDA for final review.

There is no need to wait until a CNFH-AMP is completed before beginning diagnostic studies. In fact, some areas of uncertainty may be so critical to the success of the Restoration Project to suggest that such studies should begin immediately. Diagnostic studies upon which the Restoration Project and its AMP are founded began as early as 1987 (e.g. IFIM, gravel, and barrier studies). Likewise, development of the CNFH-AMP should not be delayed until all diagnostic studies are completed.

The $1 million request represents a compromise between a much higher amount that will likely be needed for monitoring and studies in the long term (e.g. compare with $17.3 million anticipated for monitoring studies from now through 2026 under the AMP) with the fact that no specific diagnostic study plans are available at this time. Although adaptive management planning for CNFH is relatively behind the schedule set by the Restoration Project timeline, the need to implement diagnostic studies remains and can be at least partially filled with this initial funding request. Additional funding needs would be requested under separate, future proposals to CBDA and other funding sources.

No monies would be spent under this proposal until a list of diagnostic studies are prioritized per the CNFH-AMP process (described in separate proposal) and until specific study plans are developed for review by CBDA.

No money is being requested to implement adaptive management responses. While a secure source of funding for adaptive management responses is eventually

necessary, the level of scientific uncertainty is too high at this point to assess, prioritize, and implement adaptive management responses during the 2005 to 2007 funding cycle.

Goals and Objectives

The goals and objectives of this request are to obtain a commitment of funding for the implementation of diagnostic studies anticipated to be critical for the success of adaptive management at CNFH and, hence, critical for the success of the Battle Creek Salmon and Steelhead Restoration Project. These studies would reduce scientific uncertainty that has been recognized to pertain to the Restoration Project.

The goals and objectives of the CNFH-AMP would include those of the Restoration Project in addition to legally-mandated hatchery-specific goals and objectives, including but not limited to those in the CBDA EIS. Additional goals for the CNFH-AMP are included in this response under separate cover.

Table 1. Preliminary and non-prioritized list of studies, analyses, or evaluations that may be required to adaptively management CNFH to insure compatibility with the Restoration Project.

The following is a preliminary and non-prioritized list of studies, analyses, or evaluations that may be included in the Coleman National Fish Hatchery Adaptive Management Plan. The adaptive management diagnostic studies listed below were recommended or inferred from the CALFED Science Report entitled *Compatibility of Coleman National Fish Hatchery Operations and Restoration of Anadromous Salmonids in Battle Creek.* Some of the listed actions may be more directly related to fishery management strategies associated with the Battle Creek Salmon and Steelhead Restoration Project as opposed to adaptive management of hatchery operations; those items should perhaps be covered in AMP for the Restoration Project rather than the CNFH AMP. Actual development of the Coleman AMP will include prioritization of diagnostic studies and actions, exclusion of studies and actions, and/or inclusion of additional studies and actions as deemed appropriate through an open process. During the process of developing the Coleman AMP funding estimates associated with adaptive management actions will be will be formulated.

- Genetic analysis of steelhead and rainbow trout in the Battle Creek basin to assist population management
- Genetic analysis (run determination) of salmon encountered at the CNFH barrier weir during the late-summer (July-August) to formulate a strategy for managing (allowing/disallowing) passage.
- Genetic analysis (run determination) of unmarked salmon encountered at CNFH during and shortly after the late-fall Chinook salmon broodstock collection season to formulate a strategy for managing passage.
- Evaluation of spawning characteristics (e.g., spawn timing, location) of LFC and WCS passed upstream of the CNFH weir
- Genetic monitoring of fish collected at CNFH to detect hybridization
- Evaluation of juvenile releases on forage supply in lower Battle Creek.
- Study components may include:
- Stomach content analysis of juvenile hatchery fish intercepted at mouth of Battle Creek
- Pre-and post-assessments of forage base in lower Battle Creek
- Controlled predation bioassays
- Analysis of emigration patterns of hatchery fish
- Analysis of rate of residualization by hatchery steelhead
- Analysis of density-dependent effects of CNFH releases.
- Study components may include:
- Pre- and Post-release assessments of fish community in lower Battle Creek
- Continued and extended monitoring of the numbers, temporal and spatial distributions, and diet for juvenile fishes (hatchery and natural) in lower and upper Battle Creek
- Further evaluation of competition between hatchery and natural fishes
- Evaluation of the possibility of using an alternate location to collect hatchery broodstock (such as a ditch connection to the Sacramento River)
- Evaluation of mortality associated with indirect predation
- Evaluation of homing and straying of wild and hatchery fishes
- Evaluation of relative reproductive success of hatchery and natural steelhead in Battle Creek (dependent upon steelhead passage decisions).
- Evaluation of holding, crowding, and handling on prespawn mortality of fishes diverted into CNFH and released upstream – particularly winter-run and spring-run Chinook and steelhead
- Monitoring of unintended escapement past the CNFH barrier weir
- Explore alternative methods to remove additional excess hatchery fall Chinook adults from lower Battle Creek
- Evaluate pathogen/disease dynamics among wild and hatchery fishes (salmonid and nonsalmonid) in Battle Creek.
- Describe population dynamics of each run.
- Analysis of stomach contents of adult steelhead.

Work to Be Performed

Task 1. (*to be funded under a separate proposal*) Facilitation/Coordination of CNFH-AMP Development with Technical Advisory Committee. While included under a separate CNFH-AMP proposal, commencement of this step is necessary for the performance of this request. If CNFH-AMP development is funded, Task 1 will begin in late 2005.

Task 2. (*to be funded under a separate proposal*) Develop a prioritized list of diagnostic studies within 14 months of contract initiation (e.g. by late 2006 depending on date of contract initiation). While funded under a separate proposal, this step is integrally related to the performance of this request.

Task 3. (*to be funded under a separate proposal*) Develop study plans for the top priority diagnostic studies. While funded under a separate proposal, this step is integrally related to the performance of this request.

Task 4. Submit final study plans to CBDA for review for all studies to be funded under this request (e.g. by end of 2006 depending on date of contract initiation).

Task 5. Implement diagnostic studies funded under this request to CBDA starting in 2007. Because the nature of these studies cannot be adequately described at this point, specific deliverables cannot be identified. However, the cost of producing deliverables generally required of biological studies would be included within the final budgets for these studies. These deliverables and costs would include field labor and expenses, data analysis and report writing, data management and sharing, and progress reporting and administration.

Schedule Of Deliverables

Task No. / Deliverables	**Deliverable Schedule**
TASK 1: Facilitation/Coordination of CNFH-AMP Development with Technical Advisory Committee	To be commenced at contract initiation. The process to be established for this plan's development will be in place within 2 to 6 weeks of contract initiation.
TASK 2: Prioritized List of Diagnostic Studies	14 months after contract initiation
TASK 3: Develop Study Plans for Top Priority Diagnostic Studies	16 months after contract initiation
TASK 4: Submit Final Study Plans to CBDA for Review	16 months after contract initiation
TASK 5: Implement Diagnostic Studies	2007 – 2008

Budget

Task No. Deliverables	**Estimated Cost** (*see "Budget Notes" for rationale)
TASK 1: Facilitation/Coordination of CNFH-AMP Development with Technical Advisory Committee	$0.00 (funded separately)
TASK 2: Prioritized List of Diagnostic Studies	$0.00 (funded separately)
TASK 3: Develop Study Plans for Top Priority Diagnostic Studies	$0.00 (funded separately)
TASK 4: Submit Final Study Plans to CBDA for Review	$0.00 (funded separately)
TASK 5: Implement Diagnostic Studies	$1,000,000
TOTAL	$1,000,000

March 2005 Battle Creek Salmon and Steelhead Restoration Project Budget Summary

FEATURE	1999 CALFED Funding	Element Cost Update for each Feature of the Project							Cost Difference
		CONSTRUCTION CONTRACT COST	CONT'CY (20%)	FIELD COSTS	ENGINEER'G COSTS	PLANNING COSTS	CONSTRUCTION CONTRACT ADMIN.	TOTAL BUDGET	
Coleman Dam									
Tailrace Connector - Inskip Powerhouse to Coleman Canal	$2,384,000	$1,076,200	$215,000	$1,291,200	$491,000	$168,000	$194,000	$2,144,200	**$239,800**
Dam Removal	$853,000	$214,200	$43,000	$257,200	$98,000	$33,000	$39,000	$427,200	**$425,800**
Inskip Powerhouse Bypass	$917,000	$5,270,500	$1,054,000	$6,324,500	$2,403,000	$822,000	$949,000	$10,498,500	**-$9,581,500**
Inskip Dam									
Fish Screen (220 cfs)	$1,375,000	$1,962,000	$392,000	$2,354,000	$895,000		$353,000	$3,602,000	**-$2,227,000**
Fish ladder	$963,000	$2,078,000	$416,000	$2,494,000	$948,000		$374,000	$3,816,000	**-$2,853,000**
South Powerhouse Bypass Tunnel & Tailrace Connector to Inskip Canal	$3,668,000	$6,884,200	$1,377,000	$8,261,200	$3,139,000	$1,074,000	$1,239,000	$13,713,200	**-$10,045,200**
South Dam									
Dam Removal	$3,026,000	$2,200,000	$440,000	$2,640,000	$1,003,000	$343,000	$396,000	$4,382,000	**-$1,356,000**
Wildcat Diversion Dam									
Dam Removal	$2,751,000	$2,300,000	$460,000	$2,760,000	$1,049,000	$359,000	$414,000	$4,582,000	**-$1,831,000**
Eagle Canyon Dam									
Fish Screen (70 cfs)	$1,007,000	$1,174,500	$235,000	$1,409,500	$536,000		$211,000	$2,156,500	**-$1,149,500**
Fish Ladder	$942,000	$2,242,200	$448,000	$2,690,200	$1,022,000		$404,000	$4,116,200	**-$3,174,200**
North Battle Creek Feeder Dam									
Fish Screen (55 cfs)	$535,400	$1,473,400	$295,000	$1,768,400	$672,000		$265,000	$2,705,400	**-$2,170,000**
Fish Ladder	$576,500	$982,300	$196,000	$1,178,300	$448,000		$177,000	$1,803,300	**-$1,226,800**
Access Road & Footbridge		$644,500	$129,000	$773,500	$294,000		$116,000	$1,183,500	**-$1,183,500**
Soap Creek Feeder									
Dam Removal	$183,000	$32,500	$7,000	$39,500	$15,000	$5,000	$6,000	$65,500	**$117,500**
Lower Ripley Creek Feeder Dam									
Dam Removal	$92,000	$14,700	$3,000	$17,700	$7,000	$2,000	$3,000	$29,700	**$62,300**
Asbury Pump Diversion	$0	$490,000	$98,000	$588,000	$223,000	$76,000	$88,000	$975,000	**-$975,000**
SUBTOTAL	**$19,272,900**	**$29,039,200**	**$5,808,000**	**$34,847,200**	**$13,243,000**	**$2,882,000**	**$5,228,000**	**$56,200,200**	**-$36,927,300**
Prescribed Instream Flow Releases	$0							$0	**$0**
Water Acquisition Fund	$3,000,000							$3,000,000	**$0**
Adaptive Management Fund	$0							$0	**$0**
Water Rights at Dam Removals Dedicated to the Environment in perpetutiy	$0							$0	**$0**
Anadromous Fish Monitoring	$1,000,000							$3,360,000	**-$2,360,000**
AMP, Evironmental Compliance Documentation	$2,020,000							$5,754,500	**-$3,734,500**
Cost of Forgone Power During Construction	$54,400							$54,400	**$0**
Construction Environmental Mitigation	$570,000							$5,051,150	**-$4,481,150**
Construction Real Estate Compensation	$0							$300,000	**-$300,000**
Net Present Value of Annual Forgone Power	$2,082,700							$2,082,700	**$0**
Net Present Value of O&M Impacts	$0							$0	**$0**
MLTF(Pipeline and 'Buy-out' Agreement Mitigation) -1	$0							$5,500,000	**-$5,500,000**
MLTF (Pipeline and Disinfection Mitigation) -2	$0							$12,000,000	**-$12,000,000**
Total Project Cost -1	**$28,000,000**							**$81,302,950**	**-$53,302,950**
Total Project Cost -2	**$28,000,000**							**$87,802,950**	**($59,802,950)**
RELATED PROJECT COST	$0								
Interim Flows	$0							$3,000,000	**-$3,000,000**
CNFH-AMP Development	$0							$240,000	**-$240,000**
CHFH-AMP Diagnostic Studies	$0							$1,000,000	**-$1,000,000**
Related Project Total	$0							**$4,240,000**	**-$4,240,000**
TOTAL COST -1								**$85,542,950**	**-$57,542,950**
TOTAL COST -2								**$92,042,950**	**-$64,042,950**

Notes:

1. Construction Contract Cost + Contigency Cost = Field Cost

2. Field Cost +Engineering Cost + Planning Cost + Construciton Contact Administration Cost = Total Budget Cost

3. Total Cost -1 represents the total cost utilizing the lower cost MLTF mitigation. (Asbury costs are in development and will need to be added.)

Total Cost -2 represents the total cost utilizing the higher cost MLTF mitigation. (Asbury costs are in development and will need to be added.)

MLTF mitigation options are being presented in the Draft SEIS/REIR and will be further investigated. Agreed upon MLTF mitigation will be captured in the Final EIS/EIR.