



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southwest Region  
501 West Ocean Boulevard, Suite 4200  
Long Beach, California 90802-4213

February 1, 2005

In Response Refer To:  
151422SWR1999SA1221:HLB

Honorable Magalie R. Salas  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

Re: Comments, SD1, PAD, and Study Requests for DeSabra-Centerville Hydroelectric Project  
(FERC No. 803-068)


Dear Ms. Salas:

This letter presents the National Marine Fisheries Service's (NOAA Fisheries) comments on the Federal Energy Regulatory Commission's (FERC) Scoping Document 1 (Enclosure 1), and Pacific Gas and Electric Company's (PG&E) Pre-application Document (Enclosure 2), for the relicensing of the DeSabra-Centerville Hydroelectric Project (FERC No. 803-068). These facilities are located within anadromous waters occupied by Federally threatened Central Valley spring-run Chinook salmon, threatened Central Valley steelhead, and species of special concern fall and late-fall run Chinook salmon. The project is also within the proposed critical habitat of Central Valley spring-run Chinook salmon and Central Valley steelhead.

In general, our comments address the scope of the regulatory framework pursuant to the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and the Federal Power Act (FPA). Our comments also address issues related to potential impacts to salmon and steelhead and their habitats associated with FERC No. 803-068 facilities, operations, and maintenance. Our initial study comments are intended to facilitate the collection of information necessary to conduct effects analyses and to develop conservation measures, reasonable and prudent measures, and protection, mitigation, and enhancement measures pursuant to these Acts.

If you have any questions regarding this correspondence, please contact Mr. Howard Brown in our Sacramento Area Office, 650 Capitol Mall, Suite 8-300, Sacramento, CA 95814. Mr. Brown may be reached by telephone at (916) 930-3608, or by Fax at (916) 930-3629.

Sincerely,

  
Rodney R. McInnis  
Regional Administrator



## Enclosures

cc: NOAA Fisheries-PRD, Long Beach, CA  
Steve Edmondson, NOAA Fisheries, Santa Rosa, CA  
Dan Hytrek, NOAA Fisheries, Long Beach, CA

**National Marine Fisheries Service Comments  
on  
Scoping Document 1 (SD1)  
DeSabra-Centerville Project (FERC 803-068)**

**I. NOAA Fisheries Interest in these Proceedings**

NOAA Fisheries is responsible for protecting and managing a variety of marine animals and their habitat, including Pacific salmon and steelhead, pursuant to provisions of the Endangered Species Act (ESA) (16 U.S.C. § 1531 *et seq.*), the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 *et seq.*), and the Fish and Wildlife Coordination Act (FWA), and the Federal Power Act (FPA). The NOAA Fisheries Southwest Region plays a role in the management of living marine resources in areas under the jurisdiction of the State of California, provides scientific and policy leadership, and recommends and implements conservation and management measures as appropriate. NOAA Fisheries administers Sustainable Fisheries, Protected Resources, and Habitat Conservation programs throughout the Southwest Region. Through these programs, NOAA Fisheries manages the recreational and commercial fisheries of Southwest region to provide a sustainable harvest; reviews and evaluates the impacts of water resource development activities on marine, estuarine and anadromous fishery resources and the habitats which support them; and administers programs, laws, and acts that promote and support conservation, protection, and recovery of salmonid resources in Central California

An important goal of NOAA Fisheries is to ensure that the processes of negotiation, and public and environmental review will result in decisions that minimize project-related impacts, provide for full and adequate protection, mitigation and enhancement of anadromous fish, and other resources affected by the Project, in accordance with our statutory obligations under the ESA, MSA, the FPA and other relevant jurisdictional authorities.

**II. NOAA Fisheries Resource Goals and Objectives**

**A. Resource Goals**

1. Protect, conserve, enhance, and recover native anadromous salmonids and their habitats by providing access to historic habitats and by protecting, enhancing, and restoring fully functioning habitat conditions.
2. Identify and implement measures to protect, mitigate or minimize direct, indirect, and cumulative impacts to, and enhance native anadromous salmonid

resources, including related holding, spawning, rearing, and migration habitats and adjoining riparian habitats.

3. Monitor anadromous fishery habitat conditions, habitat utilization, and population trends.

## **B. Resource Objectives**

Some or all of the following objectives may be promoted to facilitate the protection, mitigation, or enhancement of anadromous fish species, and their associated terrestrial ecosystems. Other objectives may be promoted as new information and legislation becomes available.

1. **Flows** - Implement scheduled flows in Butte Creek and regulated tributaries to the benefit of native anadromous salmonids and their habitats. This includes providing a range or schedule of flows necessary to: a) optimize suitable habitat; b.) minimize water temperatures during critical periods; c) stabilize flows during spawning and incubation of in-gravel forms; d) facilitate the efficient migration of spawning adults, safe and timely emigration of smolts, and movement of rearing juveniles between feeding and sheltering areas; e) ensure redd placement in viable areas; and f) preserve channel forming processes, riparian habitat protection, and maintenance movement of forage communities. This also includes impacts of flood control, irrigation, or other project structures or operations that act to displace individuals or their forage or destabilizes, scours, or degrades physical, chemical, or biological quality of habitat.
2. **Water Quality** - Modify project structures or operations necessary to mitigate direct, indirect, or cumulative water temperature and quality impacts associated with project structures and operations or enhance water temperature and quality conditions in salmonid habitat.
3. **Water Availability** - Coordinate operations with other projects, programs or initiatives, and/or use water transfers, water exchanges, water purchases or other forms of agreements to maximize potential benefits to anadromous salmonids that are affected by limited water supplies.
4. **Fish Passage** - Provide passage for anadromous fish to historic spawning, rearing and migration habitats within or near the project. Passage within or near the Project boundary may include modifications to project facilities and operations necessary to ensure the safe, timely, and efficient passage of upstream migrating adults, downstream passage of emigrating juveniles, and passage necessary for juveniles to access habitat necessary for the seasonal movement of rearing juveniles to feeding and shelter habitats.

5. Channel Maintenance - Implement flow regimes and non-flow related measures necessary to mitigate and minimize direct, indirect, and cumulative impacts of project facilities and operations on sediment movement and deposition, river geometry, and channel characteristics. This includes impacts on stream competence, capacity, flood plain conductivity, bank stability and extent, duration, and repetition of high flow events. In addition, this includes impacts to habitat diversity and complexity such as pool riffle sequencing and instream cover.
6. Predation - Minimize and mitigate the impact of Project structures or operations that either have in the past or continue to introduce predators, create suitable habitat for predators, harbor predators, or are conducive to the predation of native anadromous salmonids.
7. Riparian Habitat - Protect, mitigate or minimize direct, indirect, and cumulative impacts to, and enhance riparian habitat and habitat functions necessary to mitigate and minimize direct, indirect and cumulative impacts of project facilities and operations.
8. Flow Ramping - Modify project structures or operations necessary to minimize impacts of flow fluctuations associated with increases or decreases in project discharges. .
9. Coordination - In developing alternatives for relicensing, include a full range of alternatives for modifying project and non-project structures and operations to the benefit of anadromous salmonids and their habitats, while minimizing conflicts with operational requirements and other beneficial uses. This includes developing alternatives for greater coordination with other stakeholders and water development projects to ensure that, at a minimum, project structures and operations are consistent with on-going and future fishery restoration efforts and potentially enhance these efforts.

### **III. SCOPE OF CONSULTATION PURSUANT TO THE ENDANGERED SPECIES ACT**

Section 7(a)(1) of the Endangered Species Act (ESA) directs Federal agencies to further the purpose of the ESA by carrying out programs for the conservation of Federally listed species. Section 7(a)(2) of the ESA states that Federal agencies shall, in consultation with the Secretary of the Interior or the Secretary of Commerce, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the adverse modification of designated critical habitat. Consultation is necessary if the Federal action may affect listed species or their critical habitat. If the Federal action is likely to adversely affect listed species, formal consultation must be initiated by the action agency. An

action is considered to have an adverse effect if it results in the take of a Federally listed species.

Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NOAA Fisheries as an act which kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering. Section 9(a)(1) of the ESA prohibits the take of an endangered or threatened species without special exemption.

The section 7 consultation process is described by Federal regulation (50 CFR §402). To comply with the section 7 regulations, an initiation package is submitted with the request for consultation and must include the following:

1. A description of the action being covered.
2. A description of the specific area that may be affected by the action. The “action area” is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR 402.2).
3. A description of any listed species or critical habitat that may be affected by the action.
4. A description of the manner in which the action may affect any listed species or critical habitat, and an analysis of any direct, indirect, or cumulative effects. Direct effects to listed species or designated critical habitat occur during implementation of the project. Indirect effects occur later in time or offsite, but are reasonably certain to occur. For purposes of the ESA, cumulative effects are defined as the effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within an action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions are not included here because they require separate consultation pursuant to section 7 of the ESA.
5. Relevant reports, including any environmental impact statements, environmental assessments, biological assessments or other analysis prepared on the proposal.
6. Any other relevant studies or other information available on the action, the affected listed species, or critical habitat.

The following list includes the Federally listed anadromous salmonids that occur within the

action area, and may be affected by the proposed action:

- Central Valley spring-run Chinook salmon - threatened
- Central Valley steelhead - threatened

Additionally, stream reaches within or near the project area may be proposed for designation as critical habitat for Central Valley spring-run Chinook salmon and Central Valley steelhead. For specific start and end points of proposed stream reaches, refer to the December 10, 2004 proposed rule to designate critical habitat for seven evolutionarily significant units of Pacific salmon and steelhead in California (69 FR 71880). The Federal Register Notice can be found at: <http://swr.ucsd.edu/salmon/69%20FR%2071880.pdf>. An analysis of critical habitat should consider the effects of the action on the primary biological or physical constituent elements within the defined area that are essential to the conservation of the species. These primary elements may include roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types (50CFR § 424.12).

The joint Handbook in the section “Determining the effect of ongoing water projects” (at 4-28) states that when analyzing the effects of ongoing federal discretionary operations of water projects and water contracts, the Services’ are to approach their analysis in the same way that they would analyze a new license or contract, thus considering:

1. The total effects of all past activities, including effects of the past operation of the project, current non-federal activities, and Federal projects with completed section 7 consultations, form the environmental baseline;
2. To this baseline, future direct and indirect impacts of the operation over the new license or contract period, including effects of any interrelated and interdependent activities, and any reasonably certain future non-Federal activities (cumulative effects), are added to determine the total effect on listed species and their habitat.

#### **IV. SCOPE OF CONSULTATION PURSUANT TO THE MAGNUSON-STEVENS FISHERY CONSERVATION ACT**

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) set forth the Essential Fish Habitat (EFH) provisions to identify and protect important habitats of Federally managed marine and anadromous fish species. Federal agencies which fund, authorize, or undertake activities that may adversely effect EFH are required to consult with NOAA Fisheries regarding the potential effects of their actions on EFH, and respond in writing to NOAA Fisheries’ EFH conservation recommendations (50 CFR 600.920).

An adverse effect is defined as any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

For a guide to EFH consultations refer to:

[http://www.nmfs.noaa.gov/habitat/habitatprotection/efh\\_guidance.htm](http://www.nmfs.noaa.gov/habitat/habitatprotection/efh_guidance.htm).

## **V. NATIONAL ENVIRONMENTAL POLICY ACT**

The implementing regulations for NEPA require that Federal action agencies must analyze the direct and indirect environmental effects and cumulative impacts of project alternatives and connected actions. The regulations emphasize agency cooperation early in the NEPA process. Section 1501.6. Section 1501.7 on "scoping" also provides that all affected Federal agencies are to be invited to participate in scoping the environmental issues and to identify the various environmental review and consultation requirements that may apply to the proposed action. Further, Section 1502.25(b) requires that the draft EIS list all the federal permits, licenses and other entitlements that are needed to implement the proposal.

## **VI. FEDERAL POWER ACT**

### **A. Section 18 of the FPA**

Section 18 of the FPA expressly grants to the Department of Commerce and the Department of the Interior (Departments) exclusive authority to prescribe fishways. Section 18 states that the Commission must require construction, maintenance, and operation by a licensee at its own expense of such fishways as may be prescribed by the Secretary of Commerce or the Secretary of the Interior. Fishways prescribed under Section 18 by the Departments are mandatory upon the Commission. Within the Department of the Interior, the authority to prescribe fishways is delegated from the Secretary of the Interior to the FWS Regional Directors. Within the Department of Commerce, the authority to prescribe fishways is delegated to the NOAA Fisheries Regional Administrators.

### **B. Section 10(j) of the FPA**

Under section 10(j) of the FPA, licenses for hydroelectric projects must include conditions to protect, mitigate damages to, and enhance fish and wildlife resources, including related



spawning grounds and habitat. These conditions are to be based on recommendations received from Federal and state fish and wildlife agencies. The Commission is required to include such recommendations unless it finds that they are inconsistent with Part I of the FPA or other applicable law, and that alternative conditions will adequately address fish and wildlife issues. Before rejecting an agency recommendation, the Commission and the agencies must attempt to resolve the inconsistency, giving due weight to the agencies' recommendations, expertise, and statutory authority. If the Commission does not adopt a 10(j) recommendation, in whole or in part, it must publish findings that adoption of the recommendation is inconsistent with the purposes and requirements of Part 1 of the FPA or other applicable provisions of law, and that conditions selected by the Commission adequately and equitably protect, mitigate damages to, and enhance fish and wildlife, including related spawning grounds and habitat.

### **C. Section 10(a)(1) of the FPA**

Resources agencies may also recommend conditions under section 10(a)(1) of the FPA. However, the Commission may accept, modify, or reject those conditions under the comprehensive development standard of Section 10(a)(1) without attempting to resolve inconsistencies or making the findings required by Section 10(j).

### **D. Authority to Recommend Studies During Relicensing**

The Code of Federal Regulations (CFR) at 18 CFR 16.8(b)(4) direct interested resource agencies to provide a potential applicant with written comments. The NOAA Fisheries has identified studies that are necessary to assess the environmental and social consequences of the proposed relicensing. Under 18 CFR each interested resource agency and Indian tribe must provide a potential applicant with written comments:

1. Identifying its determination of necessary studies to be performed or information to be provided by the potential applicant;
2. Identifying the basis for its determination;
3. Discussing its understanding of the resource issues and its goals and objectives of these resources;
4. Explaining why each study methodology recommended by it is more appropriate than other available methodology alternatives, including those identified by the potential applicant pursuant to paragraph (b) (1) (vi) of this section;
5. Documenting that the use of each study methodology recommended is a generally accepted practice; and
6. Explaining how the studies and information requested will be useful to the

agency or Indian tribe in furthering its resource goals and objectives.

## **VII. SCOPE OF RESOURCE ISSUES DESCRIBED BY FERC IN SD-1 (SD-1 SECTION 5.2)**

In this section of the SD-1, FERC presents a preliminary list of environmental issues that will be addressed in the EA. We believe that many of these issues are general and do not include sufficient detail to adequately identify potential project impacts to anadromous salmonids and their habitat. In order to meet the information needs for completing effects analyses pursuant to NEPA, the ESA, and the MSA, and for developing minimization, mitigation, protection, and enhancement measures pursuant to these Acts and to the FPA, several issues should be described in greater detail. NOAA Fisheries presents the following additional or modified issues for consideration:

### **A. Section 5.2.2 Aquatic Resources**

1. Potential for facility failures to adversely affect Federally listed salmonids and their habitat through flow modifications and water temperature changes. Facility failures could include canal and flume failures, powerhouse and bypass valve malfunctions. Outcomes could be altered short term changes to instream flow, water temperature, and turbidity.
2. Potential for project to influence water temperatures in the anadromous habitat of Butte Creek.
3. Potential for project to maximize cold water conditions for spring-run Chinook salmon and steelhead during critical time periods through coordinated facilities operation, potential facility modifications.
4. Potential for project to affect holding spawning, and rearing habitat suitability and availability throughout the anadromous reaches of the project area.
5. Potential for project facilities, operations, and maintenance to affect spring-run Chinook salmon and steelhead holding and spawning distribution in Butte Creek.
6. Potential effects of turbidity and sediment generated during facility operations and maintenance activities on Chinook salmon and steelhead spawning habitat and redd viability.
7. Potential effects of turbidity and sediment generated during facility operations and maintenance activities on benthic macroinvertebrate communities.

8. Potential effects of juvenile and adult salmon and steelhead attraction to bypass channel flows.
9. Potential effects of the Centerville Diversion Dam on the upstream migration of adult Central Valley spring-run Chinook salmon and Central Valley steelhead.
10. Potential effects of providing anadromous fish passage for Central Valley spring-run Chinook salmon and Central Valley steelhead over Centerville Diversion Dam.
11. Potential effects of facilities operations on recruitment and retention Shaded Riverine Aquatic Cover (SRA).
12. Potential effects of project operations on juvenile Central Valley spring-run Chinook salmon production in the upper anadromous reach (*i.e.*, between the Centerville Diversion Dam and the Centerville Powerhouse) versus the lower anadromous reach (*i.e.*, downstream from the Centerville Powerhouse).
13. Potential effects of the project on disease outbreaks that affect anadromous salmonids.
14. Potential for improving water use efficiency and minimize erosion risk and canal failure by lining project canals and updating project facilities.
15. Potential for project operations to coordinate with State and Federal conservation strategies such as the CALFED Ecosystem Restoration Program (ERP) and the CALFED Environmental Water Program (EWP) for improving aquatic habitat conditions within the project reach.
16. Potential for existing and future public access points and interrelated recreation activity to adversely affect Central Valley spring-run Chinook salmon and steelhead.
17. Potential for legal and illegal fishing activities within the project area to impact Federally listed salmonid individuals and populations.

## **VIII. SCOPE OF CUMULATIVE EFFECTS**

Under the Endangered Species Act, cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of

the ESA.

Under NEPA, cumulative impacts are those combined effects on quality of the human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what Federal or non-Federal agency or person undertakes such other actions (40 CFR 1508.7, 1508.25(a), and 1508.25©)). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The scope of cumulative effects should consider the following potential impacts to anadromous salmonids:

- Water Temperature from non-project hydroelectric facilities in Butte Creek.
- Recreational activities including rafting, kayaking, intertubing, swimming, and fishing.
- Upstream dredging, mining, and other activities that disturb the stream channel or banks and contribute sediment and turbidity to project reaches.

### **VIII. CONSISTENCY WITH COMPREHENSIVE PLANS**

FERC should consider the following comprehensive plans, and salmonid restoration programs in developing the EA:

1. Central Valley Project Improvement Act, Anadromous Fish Restoration Program
2. Restoring Central Valley Streams: A Plan for Action. California Department of Fish and Game. 1993
3. Steelhead Restoration and Management Plan for California, California Department of Fish and Game. 1996
4. CALFED
  - Multiple Species Conservation Strategy
  - Environmental Restoration Program
  - Watershed Restoration Program
  - CALFED
5. Lassen National Forest Land and Resource Management Plan and Long-term Anadromous Fish Strategy

6. Butte Creek Watershed Conservancy Watershed Management Strategy
7. Ducks Unlimited-Lower Butte Creek Project

**National Marine Fisheries Service Comments  
on  
Pre-application Document (PAD)  
DeSabra-Centerville Project (FERC 803-068)**

**I. Section 6.1.- Known or Potential Project Impacts**

The following additional potential project impacts should be recognized:

1. Impact of project facilities, operations, and maintenance on the short and long-term abundance and distribution of Central Valley spring-run Chinook salmon and Central Valley steelhead in Butte Creek.
2. Impacts of project facilities on the upstream migration of steelhead.
3. Impact of project facilities, operation, and maintenance on instream habitat conditions in Butte Creek for anadromous salmonids.
4. Impact of canal failures and spillway releases on salmon and steelhead spawning habitat.

**II. Section 6.2.- Preliminary Issues by Resource**

NOAA Fisheries comments on preliminary issues are provided in Enclosure 1, section IV, Scope of Resource Issues. In this section NOAA Fisheries presents additional and modified issues necessary to complete effects analyses pursuant to NEPA, the ESA, and the MSA.

**III. Section 6.3.- Potential Study and Information Gathering Needs by Resource**

Regarding the scope of specific studies, all studies must be sufficient to fully describe impacts of the proposed hydroelectric project license and alternatives. Studies designed to describe water quality, hydrology and other temporally and spatially broad parameters must include an analysis of project impacts extending downstream to the confluence with the ocean unless specific threshold analyses indicate otherwise. These studies must include direct, indirect and cumulative impacts. Similarly, records indicate that suitable habitat exists in Butte Creek upstream from Centerville Diversion Dam. Therefore, absent information indicating that fish passage is technologically infeasible, would result in comparably greater negative impacts, or would provide lesser benefits to anadromous salmonids than other alternative enhancement

measures, we must assume that access to these habitats is necessary to meet our resource management goals and objectives for anadromous fish. The licensee must conduct adequate studies to fully develop a range of alternatives for providing fish passage including plans for restoring access to historic habitats or extending the range into previously unoccupied habitats that are currently suitable.

### **Section 6.6.3 Fish and Aquatic Resources**

#### Perform Instream Flow Studies on Butte Creek

NOAA Fisheries encourages PG&E to develop site-specific habitat suitability curves for Central Valley steelhead to accompany the existing site-specific curves already developed for Central Valley spring-run Chinook salmon. The instream flows studies also should be used to quantify the amount and distribution of Chinook salmon spawning habitat upstream and downstream from the Centerville Powerhouse to improve the understanding of spawning habitat availability so that flows can be accurately managed to provide holding and spawning conditions that meet the reproduction needs of the species. NOAA Fisheries supports the comments on the Instream Flow Studies provided by Dr. Mark Gard of the U.S. Fish and Wildlife Service and encourages that they be incorporated into the final study plan. If PG&E determines through consultation with NOAA Fisheries, DFG, and FWS that a 2d approach is not necessary to characterize flow/habitat relationships on a reach scale, then additional cross sections should be added as per FWS recommendations.

#### Characterize Fish Populations in Project Reservoirs and Project-affected Stream Reaches

This study plan should be expanded to characterize anadromous Central Valley steelhead populations in the anadromous reaches of Butte Creek. The need to characterize anadromous steelhead populations is supported by the fact that the DeSabra-Centerville project affects the stream flows and water temperatures throughout the entire range of potential spawning and summer rearing habitat for steelhead in Butte Creek. No information is currently available regarding steelhead population abundance or the use of the project area by anadromous steelhead. Therefore, ascertaining project-related impacts on this species speculative and not supported by local population information. Potential techniques for monitoring steelhead could include installing temporary weirs and trapping and counting adults, conducting winter and spring snorkel surveys to count adult steelhead and/or steelhead redds, conducting kayak- or boat-based steelhead redd surveys. This information will be useful for conducting effects analyses pursuant to the ESA as well as for developing future PM&Es for steelhead.

#### Potential Enhancement of Salmon and Steelhead Passage on Butte Creek Downstream of Project

PG&E should study the benefit to Central Valley spring-run Chinook salmon and steelhead of providing upstream passage to each potential barrier on an incremental basis. To achieve this,

potential barriers should be mapped and evaluated on a case-by-case basis using an interdisciplinary team of fishery biologist and fish passage engineers. To the extent practicable, barriers should be classified as permanent or partial using the most recently available approaches for quantifying fish passage. Holding and spawning habitats also should be mapped and assessed in consideration of barrier locations. Additionally, further study at Centerville Diversion Dam should be undertaken to determine the extent to which this structure affects steelhead passage. A variety of passage improvement alternatives should also be investigated by this interdisciplinary team ranging from low-tech rock busting opportunities to high-tech engineered fish passage structures.

#### Potential Effects on Water Temperature in Butte Creek for Spring-run Chinook Salmon

NOAA Fisheries recognizes the development of the Water Temperature Model as an important component for addressing potential effects of the project on water temperature on Central Valley spring-run Chinook salmon. In addition to Central Valley spring-run Chinook salmon, this study should consider and evaluate effects to Central Valleys steelhead. The study should include an additional component that assesses facility improvements or water use efficiency to address potential water temperature impacts.

#### Significance of Fish Entrainment at Project Diversion

NOAA Fisheries believes that prior to the construction of Lower Centerville Diversion Dam, steelhead may have ascended further upstream than the present conditions allow, and that minor modifications to the Centerville Diversion Dam could re-establish upstream passage. Given this possibility there is a potential that juvenile steelhead could be entrained by the Lower Centerville Canal and removed from the population. Therefore, fish entrainment studies at the Lower Centerville Diversion are recommended so that potential steelhead entrainment rates can be quantified. Additionally, PG&E should conduct a feasibility analysis of screening the Lower Centerville Canal to prevent anadromous steelhead from being entrained if fish passage above Centerville Dam is restored.

#### Potential Effects on Anadromous Salmonids from Sediment Caused by Failure of Project Canals and Flumes

NOAA Fisheries recognizes the procedures and practices undertaken by PG&E to inspect and maintain canals and flumes. We also recognize that increasing patrols has not resulted in an increased ability to forecast potential failures because areas that fail typically do not show signs of impending failure. However, a risk assessment should be undertaken using existing information and past records to help identify the conditions that may lead to failures, the potential frequency of failures the locations that failures are most likely to occur, the proximity of these locations to anadromous salmonids and their habitat, and the potential for causing adverse effects to holding, spawning, and rearing salmonids and their habitat.



### Potential for Fish Stranding or Displacement in Stream Channels from Rapid Changes in Project Canal Flows

NOAA commends PG&E for taking steps in the fall of 2003 to minimize the risk of stranding newly-emergent Chinook salmon fry by returning the Lower Centerville Canal back into service at the rate of 5 cfs per hour, and for delaying the return to service from November 20 to December 2, 2004, when storm runoff raised instream flow at LCDD to 180 cfs. However, these recommendations were not supported by Butte Creek field data or regional information that suggests that these conditions were ideal. NOAA Fisheries believes that either stranding studies or geomorphic channel evaluations are needed to identify the locations of potential stranding areas, and accurately determine which operational scenarios minimize stranding rates. This type of information can be applied to quantify individual fish losses or the extent of affected habitat for so that an effects analysis can be conducted pursuant to the ESA. At a minimum, PG&E should conduct an assessment using existing information that identifies when project-induced flow changes are expected to occur, what ramping criteria will be followed, which life-history stages of anadromous salmonids may be present during such periods, and what relative risks are faced by the most vulnerable life history stages of affected species. Additionally, the scope of this assessment should include the potential for canal, flume, and other facility failures to affect Federally listed salmonids and their habitat through flow modifications, temporary flow interruption, and water temperature changes.

### Potential Effects on Anadromous Salmonids from Sediment Caused by Project construction, operation, and maintenance activities (see also Geology and Soils)

NOAA Fisheries frequently receives notification of episodes of high turbidity within the project reach on Butte Creek. Although the development and implementation of annual operations plans has addressed this issue by establishing a communications protocol, significant potential to impact anadromous fish and their habitat still exists. A comprehensive turbidity and sediment monitoring plan should be developed to track and compare project-related events and contributions to background levels. The plan also should measure instream sediment levels to determine the effects of project-related turbidity and sediment on Central Valley spring-run Chinook salmon and Central Valley steelhead redds viability, and egg and larval survival. Additional minimization and avoidance measures should be developed.