

## COMMENTS

Draft Environmental Assessment  
DeSabra – Centerville Project (FERC No. 803)  
Docket No. P-803-068  
Applicant: Pacific Gas & Electric Co.

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February 26, 2009

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission

Dear Ms. Bose:

The California Sportfishing Protection Alliance, Friends of Butte Creek, Friends of the River, American Whitewater and Golden West Women Flyfishers (hereafter, Conservation Groups) have reviewed the Environmental Assessment for the DeSabra – Centerville Project relicensing, issued by the Commission on December 29, 2008. Conservation Groups offer the following comments on this document, both as an Environmental Assessment under the National Environmental Protection Act, and as a Biological Assessment for threatened Central Valley spring-run Chinook salmon and Central Valley steelhead, under Section 7 of the Federal Endangered Species Act.

## SUMMARY OF ISSUES

### Statutory Background

The National Environmental Policy Act (“NEPA”), 42 U.S.C. §§ 4321-4347, is our “basic national charter for the protection of the environment.” 40 C.F.R. § 1500.1. NEPA’s fundamental purposes are to guarantee that: (1) agencies take a “hard look” at the environmental impacts of their actions by ensuring that they “will have available, and will carefully consider, detailed information concerning significant environmental impacts;” and (2) “the relevant information will be made available to the larger audience that may also play a role in both the decision making process and the implementation of that decision.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

To accomplish these purposes, NEPA requires all agencies of the federal government to prepare a “detailed statement” that discusses the environmental impacts of, and reasonable alternatives to, all “major Federal actions significantly affecting the quality of the human environment.” 42 U.S.C. § 4332(2)(C). This statement is commonly known as an environmental impact statement (“EIS”). *See* 40 C.F.R. Part 1502. An EIS must provide a “full and fair discussion of significant environmental impacts” of a proposed action, “supported by evidence that the agency has made the necessary environmental analyses.” *Id.* at § 1502.1. A limited discussion of impacts is permissible only where the EIS demonstrates that no further inquiry is warranted. *Id.* at § 1502.2(b).

To determine whether the effects of an agency action may “significantly” affect the environment, thus requiring preparation of an EIS, an agency may first prepare an environmental assessment (“EA”). 40 C.F.R. § 1501.4(b). The objective of an EA is to “[b]riefly provide sufficient evidence and analysis for determining whether to prepare” an EIS. *Id.* at § 1508.9(a)(1). If the EA indicates that the federal action “may” significantly affect the quality of the human environment, the agency must prepare an EIS. 40 C.F.R. § 1501.4; 42 U.S.C. § 4332(2)(C). *See Kern v. United States Bureau of Land Mgmt.*, 284 F.3d 1062, 1066-67 (9th Cir. 2002). “An agency’s decision not to prepare an EIS will be considered unreasonable if the agency fails to supply a convincing statement of reasons why potential effects are insignificant.” *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1211 (9th Cir. 1998).

The threshold for requiring preparation of an EIS is low. *See Natural Resources Defense Council v. Duvall*, 777 F. Supp. 1533, 1537-38 (E.D. Cal. 1991) (noting that “the [Ninth] Circuit has established a relatively low threshold for preparation of an EIS”) (citations omitted). The Ninth Circuit has stressed that the evidence regarding the significance of the impacts need not be conclusive in order to compel the preparation of an EIS. Rather,

[A]n EIS must be prepared if substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor. The plaintiff need not show that significant effects

will in fact occur, but if the plaintiff raises substantial questions whether a project may have a significant effect, an EIS must be prepared.

*LaFlamme v. FERC*, 852 F.2d 389, 397 (9th Cir. 1988) (citations omitted).

### **Level of analysis under NEPA**

The Commission has chosen to issue an Environmental Analysis, rather than an Environmental Impact Statement, for relicensing this project. The need for an EIS on this project was an issue that was specifically raised in scoping comments by Friends of the River (January 27, 2005):

FERC's regulations provide that an EIS must be completed for major federal actions that significantly affect the quality of the human environment. 18 CFR 380.6(b) The DeSabra-Centerville project continues to impact those who live on and around Butte Creek. The project has temperature and water quality impacts that affect the creek's aesthetics and may have contributed to large fish kills on Butte Creek. ... Butte Creek supports one of the largest runs of threatened spring run Chinook salmon in California's Central Valley. It also supports threatened steelhead. NEPA guidelines require an EIS for a project that may result in significant impacts to ESA listed species and their habitat.

The assertion that relicensing this project will not significantly affect the environment is untenable. As noted in our comments, a determination of whether a project is significant, thus requiring the preparation of an EIS, includes a consideration of whether there are "unique characteristics" of the geographic area such as "ecologically critical areas," as well as "[t]he degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act." 40 C.F.R. § 1508.27(b)(3), (9).

Through its system of dams, canals, reservoirs, powerhouses, and other facilities, the DeSabra-Centerville Project has completely supplanted the natural hydrology of Butte Creek and directly impacts the spring-run Chinook salmon, a species listed as threatened under the Endangered Species Act. 64 Fed. Reg. 50,394 (Sept. 16, 1999). In fact, Butte Creek contains the largest remaining population of spring-run Chinook and provides critical habitat for the species. *Id.* at 50,399; 70 Fed. Reg. 52,488, 52,590-91 (Sept. 2, 2005). Butte Creek also provides habitat for the threatened Central Valley steelhead. *See* 63 Fed. Reg. 13,347 (Mar. 19, 1998); 70 Fed. Reg. at 52,518.

In 2002, CDFG counted 1,699 pre-spawning mortalities and subsequently estimated that at least 3,431 spring-run Chinook, or over 20 percent of the 16,028 estimated to have returned to Butte Creek that year, died before spawning. In the summer of 2003, there was pre-spawn mortality of over 10,000 spring-run Chinook, mostly in the Centerville Bypass Reach, in which flow is reduced by the Project. In 2008, there was pre-spawn mortality of over 1000 fish in Butte Creek, out of an estimated 11,000 returning adult spring-run (Clint Garman, CDFG, pers. comm.). By comparison, combined returns in

2008 to Mill Creek and Deer Creek, which support the second and third largest runs of Central Valley spring-run Chinook with genetic integrity, numbered 500 adults. Butte Creek, in 2008, was therefore responsible for about 90% of the returning Central Valley spring-run Chinook; more wild spring-run died before spawning in Butte Creek than returned anywhere else in the Central Valley. In addition, preliminary estimates indicate that the spring-run salmon adults that returned the Butte Creek in 2008 may account for as many as ten percent of all adult returns to the Central Valley of salmon of any kind.

To suggest that relicensing the DeSabra – Centerville Project will not significantly affect the quality of the human environment, or that no significant impacts to threatened Central Valley spring-run Chinook may result from the proposed action, is not supported by the record.

The question of whether relicensing the DeSabra – Centerville Project constitutes a “major” federal action is not adequately addressed in considering that this application is for a “Minor-Part Hydropower License,” as stated in the title of the Environmental Assessment. When the future of what today constitutes 90% of a listed species and 10% of all runs of salmon in California’s Central Valley are at stake in the outcome, a major federal action is being contemplated under any reasonable definition.

The Commission should therefore re-work the environmental analysis of this project and reissue its analysis as a draft Environmental Impact Statement.

### **Alternatives considered under NEPA**

It is well established that the discussion of alternatives is the “heart” of the NEPA process. 40 C.F.R. § 1502.14; *Ctr. for Biological Diversity v. National Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008). NEPA requires agencies to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. § 4332(2)(E). Such an analysis must “rigorously explore and objectively evaluate all reasonable alternatives” to the proposed project in order to “sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public.” 40 C.F.R. § 1502.14(a). The existence of a viable but unexamined alternative renders an environmental impact statement inadequate. *Resources Ltd. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1994).

The alternatives presented by the Commission in the EA are unfortunately characteristic of many recent FERC environmental documents, where alternatives presented are limited to small variations on the proposed action. The “no action” alternative presented in the present document is in fact inaccurately described: it is not how the project is operated at present. Rather, this “no action alternative” represents the license conditions permitted to the licensee by the Commission in the current license, significant portions of which have been voluntarily abandoned by the licensee because their letter-of-the-law implementation poses a clear and egregious diminution of habitat for threatened anadromous fish in the Centerville Bypass Reach. As noted in the footnote to table 3-27

on page 166 of the EA (the table compares three flow scenarios for Butte Creek below Lower Centerville Diversion Dam):

The Operations and Maintenance Plan implemented in 1999 and updated annually in consultation with the agencies has controlled minimum flow releases downstream of Centerville Diversion dam. June through January values are current Operations and Maintenance Plan flow targets for Lower Centerville Diversion dam during normal and dry water year types. February through May values are proposed MIF requirements for lower Centerville Diversion dam to address steelhead spawning during normal and dry water year types.

In addition, the fish rescues noted in the summarizing chart on Draft EA page iii have already been implemented by the licensee. However, the use of this imaginary “no action” alternative is apparently carried over into the economic analysis throughout the Draft EA, notably in the annual power value figures in table 4-2 on page 314. The \$793,000 per year differential cited between “no action” and PG&E’s proposal is in significant part an accounting of paper power that has already been foregone. The same figure is given in Table 4-3, item 9, page 320.

In addition to this inaccurate “no action alternative,” the EA considers three additional alternatives:

1. The action proposed by the licensee.
2. A “Staff Alternative” which is equivalent to the licensee-proposed alternative with additions so minute that they amount to a cost increase of \$17,000 per year.
3. A third alternative where mandatory agency conditions are added, and which is really analyzed only in order to consider its cost. By far the most expensive of these mandatory conditions, a Forest Service monitoring program for the West Branch Feather River has, moreover, been challenged with an “Alternative Condition” under the Energy Policy Act of 2005, and its outcome is not certain.

The Draft EA announces on page iii of the Introduction that:

The primary issue with this project is effects on cool water habitat for federally listed threatened Central Valley spring-run Chinook salmon (Chinook salmon) and Central Valley steelhead (steelhead) in lower Butte Creek by transferring cool water in the summer from the Project’s reservoirs on the West Branch Feather River to lower Butte Creek.

Under each of the four “alternatives” analyzed in this document, this “primary issue” would be addressed in exactly the same way: summer holding conditions for spring-run Chinook and rearing conditions for Central Valley steelhead in the Centerville bypass reach would remain exactly as they are today.

There is another important aspect of the environmental baseline that is unclear in the Draft EA: whether or not the planned refurbishing of Centerville Powerhouse is included in it. In the Final License Application, Exhibit D, table D4.2-1, footnote 1, licensee states that the cost of refurbishing Centerville is included in its ongoing operation and is not included as part of the cost of the proposed action. The Commission should clarify in a new Draft EIS whether this cost is also part of its baseline. Further, it should clarify how it has addressed the costs involved in addressing the modification of the Centerville Powerhouse as a historic structure, as discussed on page 305 of the Draft EA.

### **Conservation Groups' proposed alternative**

Conservation Groups proposed in our Comments of June 27, 2008 (accession number 20080627-5050, hereafter "our REA Comments") an integrated alternative ("Alternative") that would provide more and greater cold water benefits to threatened salmonids than does the Staff alternative, or any other alternative that is presented in the EA or that has otherwise been presented in this proceeding, and would provide greater certainty that such benefits would be achieved.

Conservation Groups requested in those REA Comments that the Commission analyze Conservation Groups' proposed operation of the project as an alternative under NEPA. In response, the Commission states, on page 38 of the Draft EA: "because the alternative being proposed is not supported in its entirety by any of the resource agencies, especially those with mandatory conditioning authority, we do not consider the Conservation Groups' alternative to be a reasonable, complete NEPA alternative."

In response, we note that the only mandatory conditioning agency *under the Federal Power Act* with *mandatory authority over the "primary issue"* in this proceeding is the California State Water Resources Control Board, which is precluded from supporting any alternative presented by other parties because doing so would be pre-decisional in regards to its authority and obligations under Section 401 of the Clean Water Act. The Commission has thus erected a standard which cannot be met by definition. Further, the standard for inclusion of an alternative under NEPA is not whether an alternative has been advocated or supported by any resource agency. The standard is whether an alternative is reasonable, and whether a reasonable range of alternatives has been analyzed (regarding range, see discussion above).

The Draft EA mischaracterizes our Alternative as unreasonable:

Also, the existence of the project's diversion dams and canal system allow for the conveyance of needed cold water from the West Branch Feather River to lower Butte Creek and the expedited deliver[y] of cold water from upper Butte Creek to lower Butte Creek to support ESA listed anadromous salmonid populations. Therefore, dam removal, as proposed by the Conservation Groups, is not a reasonable alternative to relicensing the project with appropriate protection, mitigation and enhancement measures. We do however; analyze each of the

individual measures of their recommended alternative within the appropriate resource areas. (p. 38)

Our Alternative as proposed would, based on evidence in the record, provide colder water than is provided at present to the reach of Butte Creek downstream of the existing site of Centerville Powerhouse [this reach is referred to in the above citation as “lower Butte Creek”]. Our Alternative would also provide substantially colder water than is provided at present to the reach of Butte Creek upstream of the current site of Centerville Powerhouse (hereafter, Centerville Powerhouse or simply “Powerhouse”). Since Conservation Groups’ alternative would achieve the purpose of providing cold water to “lower Butte Creek,” and because evidence in the record shows that the Alternative would provide water that is colder than water than is presently provided by the project but in a different way, the Alternative thus meets the definition of “reasonable” under NEPA.

There is no evidence in the record to show that the “expedited deliver[y]” of cold water to “lower Butte Creek” is the end in itself; on the contrary, it is unreasonable on its face to suggest that rapid delivery of water that is less cold is preferable to slower-traveling water that arrives at its destination in lower Butte Creek colder. It is also unreasonable to ignore the benefits of Conservation Groups’ Alternative to water temperatures upstream of the present location of Centerville Powerhouse; yet this is exactly what the Commission, in excluding the Alternative, has done.

The Draft EA (p. 38) falsely characterizes the Alternative as being opposed to “the existence of the project’s diversion dams and canal system.” On the contrary, our Alternative seeks to make use of most of them.

Nor do we propose “dam removal” as an alternative to relicensing the project, or even as an end in itself; we propose changing the operation of the project to provide colder water to ESA listed anadromous salmonid populations: the “primary issue with this project.”

The temperature benefits of Conservation Groups’ Alternative have not been analyzed and acknowledged by the Commission. To be understood and evaluated, these temperature elements must be considered as an integrated whole. We will review these elements below. For the moment, we shall conclude our discussion of alternatives by saying that the Draft EA cuts the baby into little pieces and then erroneously finds the temperature measures posed by Conservation Groups inadequate when compared, one by one, to existing conditions. This is not the same as analyzing our Alternative as an alternative under NEPA. It is deficient under NEPA.

The Draft EA states that Conservation Groups have failed to present a reasonable alternative to analyze. We reply that the Commission has failed to provide a reasonable range of alternatives and a reasonable analysis of our Alternative in particular.

### **The EA as a Biological Assessment**

On page 7 of the document, the EA reveals that it will also serve as the Biological Assessment under Section 7 of the Endangered Species Act, both for threatened spring-run Chinook salmon and for Central Valley steelhead.

As described in the scoping comments of the National Marine Fisheries Service of February 1, 2005,

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:

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 effect 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.

The EA/BA says virtually nothing about steelhead in Butte Creek. “Data on Butte Creek steelhead in the project area are restricted to limited visual observations by anglers and Cal Fish & Game game wardens. There are no estimates of steelhead numbers for Butte Creek. Scientific data for these fish are also scarce” (p. 254). The Commission utterly failed to require the study of adult steelhead in Butte Creek (see esp. 20050817-3034 Study Plan Determination, pages 13-15). Moreover, the EA/BA does not even bother to mention fish population data which measured the use of Butte Creek downstream of Lower Centerville Diversion Dam by juvenile *O. mykiss*, let alone offer an analysis. Though the EA/BA presents WUA graphs for the Centerville bypass reach, it says nothing about the population dynamics of juvenile *O. mykiss* in the reach, and, regarding spawning, says only that “generally, it can be expected that improvements to Chinook salmon habitat conditions are also beneficial to steelhead” (p. 171). As a Biological Assessment for steelhead, the document is absolutely deficient.

The Biological Assessment for spring-run Chinook is built on speculation and conjecture, handed down from document to document: first, in Paul Ward et al, *Butte Creek Spring-run Chinook Salmon, Oncorhynchus Tshawytscha Pre-Spawn Mortality Evaluation, 2003*; next, the *Preliminary Biological Opinion* for spring-run Chinook in the DeSabra – Centerville Project submitted by the National Marine Fisheries Service to FERC in November, 2006; to licensee’s Application for License; to the present document. We note for the record the circularity of the document insofar as it is a Biological Assessment, in



that NMFS is asked to write a Biological Opinion based on the “evidence” of the speculation in its Preliminary Biological Opinion.

As NMFS noted in its response to the REA notice (20080627-5062), “the relicensing process for this project has not provided NMFS many critical information needs, which has interfered with an orderly and efficient integration of our FPA, Endangered Species Act, and Fish and Wildlife Coordination Act Responsibilities. For example, timely requests for reasonable genetics, radio telemetry and entrainment data were denied largely on the basis of formatting.”

Finally, we can only note with incredulity the following statement from page 10 of the EA/BA:

We conclude that continued operation of the project could adversely affect the Central Valley Chinook salmon and steelhead and the Central Valley Chinook salmon’s designated critical habitat. Even with the benefits the project provides to the Chinook salmon and the steelhead and their habitats, and with our recommended measures, the project may still result in the incidental take of these species or adversely modify their habitat as a result of an unanticipated shut-down of project facilities or other malfunctions. Therefore, we conclude that relicensing the project may adversely affect these species and the Central Valley Chinook salmon’s designated critical habitat. We will request formal consultation with the NMFS upon issuance of this draft EA.

The notion that take or adverse modification of critical habitat as a possible result of the project is only conceivable as a function of unanticipated shut-down or other malfunction is stunning in its complacency. The presumption that operational reforms to date, welcome, diligent, and thoughtful as they may be, have precluded future fish die-offs on the basis of an ensuing dataset of five years, and ignoring the pre-spawn mortality of about one tenth of returning spring-run in 2008 and the complete lack of investigation on the survival rates of juvenile *O. mykiss*, is wholly unwarranted.

### **The other key factors of the DeSabra – Centerville relicensing**

In addition to summer water temperature in Butte Creek from Lower Centerville Diversion Dam to Covered Bridge, there are several other factors that play a key role in shaping this process. We note again that, in addition to the critical role water temperature plays for holding spring-run Chinook, water temperature also appears, based on the evidence gathered of actual usage in Butte Creek, to play a critical role in the juvenile rearing of *O. mykiss*, some of which become steelhead.

These other key factors in relicensing this project are:

Migration of spring-run once they reach the greater project area

Amount, location and utilization of spring-run spawning habitat

Separation and crowding of holding spring-run

Habitat conditions of juvenile *O. mykiss*

Entrainment into project canals, particularly of *O. mykiss* that are potential steelhead recruits into Lower Centerville Canal

Turbidity events

Project cost and economics

## **ANALYSIS OF THE DRAFT ENVIRONMENTAL ASSESSMENT**

### **Water temperature modeling; preface**

The results from the final CE-QUAL-W2 water temperature modeling runs that were presented by the licensee as Attachment 8 in its August 14, 2008 reply comments (20080814-5057) are shown in Appendix 2 of the Draft EA, except that the first seven model runs (page 1 of “Table 1”) do not appear. Runs 8 through 15 (page 2 of “Table 1”) are shown twice (on successive pages 432 and 433). Also, the tables in the pdf version of the Draft EA are unreadable

We have copied page 1 of the table below from Attachment 8 of 20080814-5057. We recall that these tables go directly to “the primary issue with this project” (Draft EA, p. iii as cited above). The complete hash that was made of these tables in the Draft EA is unacceptable and inexcusable.

**Table 1: W2 Simulation Results: Difference between base case and simulation from Julian day 171 (6/15) to Julian day 246 (8/05) using the 2005 calibrated model (base normal hydrology, but meteorology is NMA) - Weekly Mean of the daily Maximum Temperature during the hottest month of the summer.**

Simulation	Location	Mean Temp. Difference, C	Largest Change in Daily Maximum Temperature, C	Days of Largest Temp. Difference	WQIMT+ (1915-2015), C
1 60% release from Centerville Forebay (60%)	Boys Creek Above Centerville Powerhouse	0.01	0.01	111	1.38
	Boys Creek Above Centerville Powerhouse	0.19	0.20	171	0.61
	Boys Creek at Milltown	0.11	0.11	171	1.09
2 30% release from LDC	Boys Creek Below Centerville Powerhouse	-0.09	0.01	111	1.79
	Boys Creek Above Centerville Powerhouse	-0.49	-0.50	111	-0.63
	Boys Creek at Milltown	0.11	0.11	171	1.11
3 All DeSabra Powerhouse (ASPP) in a Bank Flow	Boys Creek Below Centerville Powerhouse	0.16	0.17	111	0.67
	Boys Creek Above Centerville Powerhouse	-1.27	-1.28	100	-0.52
	Boys Creek at Milltown	0.07	0.08	111	0.49
4 50% release from Hendricks Head Dam (HDD)	Boys Creek Below Centerville Powerhouse	0.07	0.07	111	1.13
	Boys Creek Above Centerville Powerhouse	0.01	0.01	97	1.01
	Boys Creek at Milltown	0.01	0.01	111	0.21
5 90% release from WBR (Release from LDC)	Boys Creek Below Centerville Powerhouse	0.17	0.17	111	1.18
	Boys Creek Above Centerville Powerhouse	0.01	0.01	97	0.17
	Boys Creek at Milltown	0.08	0.08	111	1.11
6 50% Reduction in DeSabra Forebay (50% thermal loading)	Boys Creek Below Centerville Powerhouse	-0.19	0.01	111	0.58
	Boys Creek Above Centerville Powerhouse	-0.14	-0.07	171	-0.29
	Boys Creek at Milltown	0.11	0.11	171	1.11
7 80% Reduction in DeSabra Forebay (80% thermal loading)	Boys Creek Below Centerville Powerhouse	-0.27	-1.10	111	-0.52
	Boys Creek Above Centerville Powerhouse	-1.23	-1.23	100	-0.52
	Boys Creek at Milltown	0.11	0.11	171	0.98
	Boys Creek at Centerville	-0.25	-1.09	171	-0.61

**Water temperature modeling analysis**

Conservation Groups provided in our REA Comments an analysis of how combining several factors, notably combining an 80% reduction in DeSabra Forebay thermal loading with releasing all water from DeSabra Powerhouse, achieves a small reduction in mean daily water temperature below Centerville Powerhouse while achieving a tremendous reduction in mean daily water temperature above Centerville Powerhouse and elsewhere in the Centerville Bypass Reach.

Since we also proposed a small increase in release from the West Branch Feather River below Hendricks Diversion Dam, our Alternative in a Normal Year is shown in model run 13:

Simulation	Location	Mean Temp. Difference, C	Largest Change in Daily Maximum Temperature, C	Days of Largest Temp. Difference	WQIMT+ (1915-2015), C
13 50% release from WBR (Release from LDC)	Boys Creek Below Centerville Powerhouse	0.16	0.16	111	0.18
13 50% release from WBR (Release from LDC) and 80% release from DeSabra Forebay (80% thermal loading) and All ASPP in a Bank Flow	Boys Creek Above Centerville Powerhouse	-1.26	-1.26	100	-0.60
13 50% release from WBR (Release from LDC) and 80% release from DeSabra Forebay (80% thermal loading) and All ASPP in a Bank Flow	Boys Creek at Milltown	-0.25	-0.71	100	-0.40

This compares to the closest model run to the Staff’s recommended alternative, run 6, which would reduce thermal loading by 50% (a combination of this 50% reduction with a total 20 cfs release into WBFR was not modeled):

Simulation	Location	Mean Temp. Difference, C	Largest Change in Daily Maximum Temp. (C) 4	Delay of Largest Temp. Difference	WMMT* (JULY-SEPT), C
5 50% Reduction in Draft EA Forests (July, Winter 2004)	Batts Creek Below Centerville Powerhouse	-0.17	-0.08	218	-0.86
	Batts Creek Above Centerville Powerhouse	-0.14	-0.07	170	-0.87
	Batts Creek at Helltown	-0.15	-0.08	170	-0.84

In a dry year, our Alternative is represented in model run 29:

Simulation	Location	Mean Temp. Difference, C	Largest Change in Daily Maximum Temp. (C) 4	Delay of Largest Temp. Difference	WMMT* (JULY-SEPT), C
29 100% Reduction in Draft EA Forests (July, Winter 2004) (WFRD) 2006 (with 100% thermal loading and 100% DDFR flow in Batts Creek)	Batts Creek Below Centerville Powerhouse	-0.13	-0.70	170	0.19
	Batts Creek Above Centerville Powerhouse	-1.00	-2.91	202	-2.33
	Batts Creek at Helltown	-1.48	-2.78	202	-2.41

This compares to the Staff’s recommended dry year alternative, model run 22:

Simulation	Location	Mean Temp. Difference, C	Largest Change in Daily Maximum Temp. (C) 4	Delay of Largest Temp. Difference	WMMT* (JULY-SEPT), C
22 100% Reduction in DDFR Annual Loading	Batts Creek Below Centerville Powerhouse	0.14	2.41	214	0.11
	Batts Creek Above Centerville Powerhouse	-0.18	-1.52	217	-0.24
	Batts Creek at Helltown	0.20	1.48	211	0.48

We called attention in our REA Comments to the numbers given in the column “Mean Temp Difference, C,” and compared them to the output from other model runs as given in the same column.

Commission Staff has analyzed the results of the water temperature model runs at various points in the Draft EA, and most notably on pages 167-168. However, the Draft EA has used the WMMT (weekly mean of the maximum temperature) metric without even acknowledging this use in its narrative, and without explaining a rationale for this use. Thus, for example, on page 167, the statement is made:

However, as a result of increasing flows at Lower Centerville diversion dam, water temperatures downstream of Centerville Powerhouse increase 1.0 to 1.22°C [runs 18 and 16 respectively] in dry years, and 0.08 to 0.67°C [runs 1 and 3 respectively] in normal years, compared to existing conditions as cooler flows from Lower Centerville canal are reduced.

This narrative suggests, first, that these increases below Centerville are year-long or at least summer-long. This, of course, is not true: the WMMT metric is designed to capture the hottest week of the summer, using historic air temperatures from one of the hottest summers on record (4% of summers would be hotter). The mean daily temperatures below Centerville Powerhouse under dry year runs 18 and 16 would increase by .20° C and .34° C ( a fifth to a third of a degree) respectively. Under normal year runs 1 and 3, mean daily temperatures would increase 0.05° C and .16° C (a twentieth to a sixth of a degree) respectively.

Why Staff chose the WMMT metric for the EA is never stated. Conservation Groups used the mean daily average metric in our REA Comments after discussing the issue with agency biologists, who felt that the water temperature differences in the long haul were probably more significant than a worst case comparison. This also is consistent with the report, quoted in our REA Comments, by Dr. Alice Rich, who emphasized the importance of prolonged exposure to sublethal thermal stress. (*Preliminary comments on the Thermal Effects of PG&E's DeSabra – Centerville Project on Spring-Run Chinook Salmon (Oncorhynchus tshawytscha)*, 2007).

For the record, we point out, when comparing the right-hand column on the excerpts from the tables shown above, that under our Alternative we are looking at WMMT temperature improvements at Helltown, where spring-run salmon hold, of 2.5° C over base case, and of over 2° C when compared to Staff's alternative. Those are big enough numbers to consistently be the difference between whether salmon die or don't die.

Licensee PG&E, on page 15 of its July 30, 2008 filing of Alternative Conditions with the USDA Forest Service (20080730-5132), stated that a "0.38° C difference in WMMT below Centerville Powerhouse is considered biologically significant and could result in higher mortalities of holding Chinook, and less favorable conditions for steelhead rearing below this location." ***So what we want to know, from PG&E and from FERC staff, is how come .38° C is "biologically significant" below the Centerville Powerhouse, but 5 times that differential is not significant above the Powerhouse?*** Please recall, when formulating an answer, that the water above the Powerhouse is warmer to begin with.

### **Water temperature models not linked**

The Draft EA, on pages 256-257, states:

Project operations and maintenance will influence and affect the quality and quantity of habitat for both, the Central Valley Spring-run Chinook Salmon ESU and the Central Valley Steelhead ESU. The continue[d] operation of the DeSabra Centerville Project is critical to the continued survival of these federally listed fish. The interbasin transfer of cold water from the West Branch Feather River to lower Butte Creek improves the habitat in lower Butte Creek and allows for tolerable habitat conditions during summer heat storms where otherwise none would exist.

The SNTEMP model for Upper Butte Creek (below Butte Diversion Dam) and the CE-QUAL-W2 model for Butte Creek below DeSabra Powerhouse were not linked up, and interface between them was not possible because they operate on different timesteps. In addition, the SNTEMP model did not include Butte Creek downstream of the West Branch of Butte Creek, and did not include the operation of the Forks of Butte Project. Therefore, the benefit posited in the Draft EA on pages 256-257 has not been quantified. Failing such quantification, the “critical” nature of the DeSabra – Centerville Project to the survival of the Central Valley Spring-run Chinook Salmon ESU and the Central Valley Steelhead ESU has not been demonstrated.

We note that on the December 9, 2008, Commission staff held a conference call to discuss water temperature modeling issues for the DeSabra – Centerville relicensing, and asked specifically where the documentation of this link-up could be found. Staff was informed that there was no link-up.

Regardless of what most or all of the parties to the relicensing *believe* to be the case about the overall benefit of the project to these ESU’s, the lack of quantification of the thermal benefit of the project to these ESU’s should be stated in a revised Draft EIS on the relicensing proposal.

### **Temperature control at DeSabra Forebay**

Staff recommends the installation of a temperature control device at DeSabra Forebay that will reduce thermal loading as water passes through the Forebay by 50%. The greatest resulting WMMT benefit shown in the model would be .36° C (below Centerville in a Normal year), and the greatest mean daily temperature difference would be .26° C (below Centerville in a dry year).

Staff rejects the proposal that the device reduce thermal loading at DeSabra Forebay by 80%:

We do not support recommendations by FWS, NMFS, Forest Service, Cal Fish & Game, and the Conservation Groups that this plan address reducing thermal loading within DeSabra forebay by 80 percent or greater. Without taking into account minimum instream flows in the lower West Branch Feather River, during normal and dry water years, reducing thermal loading within DeSabra forebay by 80 percent would further decrease the weekly mean of the daily maximum temperature during the hottest week of the summer by approximately 0.23°C and 0.19°C, respectively, in lower Butte Creek. We estimate that the construction of such a facility would cost approximately \$201,100 more annually than a facility which reduces thermal loading by 50 percent. Therefore, we conclude that these additional costs do not justify the limited additional

temperature reductions that would result in lower Butte Creek by reducing thermal loading by 80 percent.

We have reviewed the temperature model runs carefully, and cannot determine on which numbers the temperature figures cited above are based. The differential in WMMT output below Centerville Powerhouse between run 6 (50% reduction) and run 7 (80% reduction) in a normal year is .24°C. The differential in WMMT output below Centerville Powerhouse between run 22 (50% reduction) and 23 (80% reduction) in a dry year is .13°C. In any case, the numbers are relatively small. We agree. ***The overall benefit for any thermal control device at any modeled point in Butte Creek is very small if the only change made is to reduce thermal loading at DeSabra Forebay.***

We now reference the output from model runs 11 and 27. ***If thermal loading at DeSabra Forebay is reduced by 80%, and the water below DeSabra Powerhouse is released into Butte Creek, the water temperatures in the areas where more than half the spring-run Chinook hold is reduced by large numbers, more than 2½°C at Pool 4, for example.***

***Reduce thermal loading by 80% AND shut down the Powerhouse, and FISH DON'T DIE.***

Even adding slightly more flow into the West Branch Feather River, as proposed by Conservation Groups in our REA Alternative, still leaves the improvement in all years at Helltown at or above 2.4°C, which is 2°C better than staff alternative in normal years and 1.92°C better in dry years.

Staff provides no basis for its cost analysis of temperature control at DeSabra Forebay. Staff estimates the cost of PG&E's very preliminary sheet pile cooling option (50%) for DeSabra Forebay at two million dollars, and a very preliminary option of installing a pipe to convey water within the Forebay from inflow to penstock intake (80%) at three million dollars. The only objective basis we can see for the numbers used by the Commission to estimate the cost of DeSabra Forebay temperature improvements is a reflex deference to the licensee coupled with a decision on operation of the Centerville bypass reach that sees not opportunity but simply a given. The stated cost differential, further, is presented as annualized cost, which at \$200,000 per year makes the cost appear as something much greater than it is.

Subsequent investigation by PG&E has shown the alternatives to cost out about the same, and PG&E to its credit now seems to be pursuing a pipe option that is more effective than sheet pile in terms of cooling.

### **The blessed and the damned**

All listed fish must be protected under the Endangered Species Act. Take of the listed fish that happen to migrate upstream of Centerville Powerhouse is not exempted from this requirement.

However, the Draft EA, the licensee, and even some of the resource agencies have created two categories of listed fish, in particular two categories of holding adult spring-run Chinook, one category of which is treated as superior to the other.

The superior fish are those that remain downstream of the Centerville Powerhouse. These are the good fish, the wise fish, if you will the blessed fish, which remain close to the greatest amount of spawning gravels, and thus fulfill their roles of reproduction efficiently.

The other fish, the different fish, those who have gone astray, are the adult spring-run that have unwisely swum past the Centerville Powerhouse, upstream to the Centerville bypass reach. Having once crossed into such troubled waters, the combined powers-that-be collectively propose to condemn them, not to the certainty, but surely to a greatly heightened risk of pre-spawn mortality because of increased thermal stress, in order to better protect the blessed fish.

Less metaphorically, there are numerous unsupported assumptions underlying the fundamental resource management decision which marginally enhances holding habitat downstream of Centerville at the cost of severely degrading holding habitat upstream of Centerville. These assumptions include:

- 1) That there is no “significant” downstream migration from the bypass reach to the reach downstream of Centerville Powerhouse.
- 2) That the distance that any fish that do migrate downstream from above the Powerhouse to below is known.
- 3) That the fish below the Powerhouse do not migrate downstream to further below the Powerhouse, thus allowing migrants from above the Powerhouse to efficiently use the gravels downstream of, but closer to, the Powerhouse.
- 4) That there is no significant upstream migration during the summer by fish in the bypass reach under present operation of the project.
- 5) That the carrying capacity for spawning spring-run Chinook both upstream of the Powerhouse and downstream of the Powerhouse is accurately understood by interpreting the modeling efforts done by the Fish & Wildlife Service in 1999.
- 6) That the ratio of actual smolt production upstream and downstream of Centerville Powerhouse is proportional to the modeled carrying capacity of spawning habitat in each reach.
- 7) That the spring-run Chinook in Butte Creek are more tolerant of thermal stress than spring-run in other locations.
- 8) That the operation of the project and de facto creation of a summertime “thermal barrier” at Centerville Powerhouse is the most efficient management tool for separating spring-run at that point in the system.

Confirmation or alteration of these assumptions could have occurred had these issues been appropriately studied in the relicensing process. Radio tagging and tracking of adult fish could have addressed the migration issues, both upstream and downstream. Physical measurement of the spawning habitat upstream of Centerville Powerhouse, and/or screw



traps at or near the Centerville Powerhouse, could have provided evidence regarding the production of smolts in the bypass reach. A physiological study of the effects of thermal stress on Butte Creek spring-run could have quantified the level of risk in high summer water temperatures

No such studies were approved by the Commission.

The annual (2003-2006) CDFG *Pre-Spawn Mortality Reports*, at least one of which was adopted as an official study report for the purposes of this relicensing, show that the number of spring-run that hold upstream of Centerville Powerhouse vary from less than half to over two-thirds of all holding fish in Butte Creek in any given year. These reports, and a spreadsheet from CDFG that shows holding and spawning locations of spring-run in 2007, show that as many as 25% of the spring-run that hold upstream of Centerville Powerhouse spawn downstream of it (see also Draft EA, p. 167). The large number of fish that hold directly downstream of Centerville Powerhouse also suggests that there is some validity to the “thermal barrier” concept, but the variability in the numbers of fish that hold both directly downstream of the Powerhouse and still further downstream suggests there is limited effectiveness to this approach as a management tool.

### **Conservation Groups’ proposal for use of a weir**

In our REA Comments, we suggest the use of a resistance board weir, such as that used by the Fish & Wildlife Service and Cramer Fish Sciences on the Stanislaus River, as a superior management tool on Butte Creek. We provided a reference to a document which discusses such a weir (Anderson, Jesse T., et al, *Upstream Fish Passage at a Resistance Board Weir Using Infrared and Digital Technology in the Lower Stanislaus River*, California, Cramer Fish Sciences for USFWS, 2007), and provided an electronic version of this document to the Commission. This document was posted in the e-library on June 30, 2008 (20080630-5015).

We suggested in our REA Comments the placement of such a weir just upstream of the current location of Centerville Powerhouse. It has become evident to us since then that some people failed to understand that such a weir is equipped with a gate that can be opened or closed by an operator. Such flexibility would allow for active management of the number of fish that move upstream from the area of the Powerhouse at any time after the weir was installed in any given year, presumably in or around early June. As determined by the resource agencies, the weir gate could be closed, or opened. Note that opening the gate on the weir would also allow downstream migration of fish ready to spawn, without requiring human presence in the river.

PG&E, in its reply comments of August 14, 2008 (20080814-5057), simply ignored the portion of our proposal that dealt with a weir, and addressed only our proposal to leave all the water in the summer in Butte Creek, diverting no water at Lower Centerville Diversion Dam. Licensee then arrived at the impossible solution:

In all probability, these fish would not remain below Centerville PH under the Conservation Group's proposal, but would be induced to move upstream by these warmer water temperatures and higher attraction flows which would increase the concentration of adult spring-run Chinook above Centerville Powerhouse and exacerbate the already crowded conditions. (Attachment 6, pp. 2-3).

Clearly, we proposed the weir to avoid precisely such a *possibility*. Note that it is not a "probability," because there is no substantial evidence to support that contention. However, probability or possibility, the belief or simply the fear that increased summer flow would induce upstream migration, became, in 2003, the rationale for failure to release more water into the Centerville Bypass Reach in the face of a die-off that ended with the pre-spawn mortality of over 10,000 spring-run.

In our REA Comments (p. 14), we quoted correspondence that demonstrated how in 2003 this fear played out in action, or more precisely in inaction. We pointed out that, even under existing operation, a weir would allow emergency release of water into the Bypass reach while preventing migration upstream from the Centerville Powerhouse. A weir would serve, therefore, as a form of insurance policy, so that in the face of emergency, measures could be taken that last time no one had the courage to take. Neither licensee, the Commission, nor the resource agencies have offered an alternative should a future fish kill come to pass; every indication is they'd all do the same thing all over again. This is analogous to those who think that "don't get sick" is a national health policy.

When large numbers of a listed species die in a stream from which a federal project has removed a substantial portion of flow, it is not reasonable to maintain that an "adverse modification of critical habitat" has not taken place. Nor does it make sense to say that the action of removing water from the stream has not "reduced the value of critical habitat."

The Commission, for its part, offered a response (to our proposal of a weir) that was an artifact of its determination to mince our proposal into pieces before addressing it (cf. discussion of alternatives, above). The result was painful, though artistic in its illogic:

The Conservation Groups recommend installation of a removable weir to limit upstream migration of Chinook salmon to enable PG&E's monitoring of Chinook salmon migration, holding, and spawning, and that the monitoring would then be used to set a default protocol for the weir's installation and removal, for the better management of Chinook salmon habitat and spawning. To address concern for the effects of the PG&E DeSabra-Centerville project on the survival Chinook salmon, Cal Fish & Game constructed a removable fish barrier dam above the Centerville Powerhouse to confine all Chinook salmon to the reach below the Powerhouse. This action reduced the quantity of holding and spawning habitat for the salmon, but limited their exposure to low flow conditions and high water temperatures. The barrier dam was removed in the 1980s. Since then anadromous fish returns to Butte Creek exceed the historical returns when the barrier dam was in place. As a result, we do not find any reason to install a removable weir or a need to set a

protocol for its installation and removal as recommended by the Conservation Groups' 10(a) recommendation 1(c). (Draft EA, p. 381).

But the weir as discussed in our REA Comments wasn't simply about monitoring, and it wasn't about keeping *all* spring-run Chinook out of the bypass reach. It was first and foremost about separating fish more actively and consciously, in order to reduce the risk inherent in the crowding of fish. It was then about, possibly, collecting some of the evidence that FERC and the licensee never got around to gathering, while limiting and managing the risk involved in that collection.

Paul Ward et al, in *Butte Creek Spring-run Chinook Salmon, Oncorhynchus Tshawytscha Pre-Spawn Mortality Evaluation 2003*, (California Department of Fish and Game, 2004, p. 6), say of the earlier weir, referred to above in the EA: "CDFG constructed a removable barrier immediately above the Centerville Powerhouse in the late 1960's, which was inconsistently installed and operated until the early 1980's, when it was removed." So, because an "inconsistently installed and operated" weir was deployed in Butte Creek twenty to forty years ago, with a design and technology that presumably dated from the sixties, Commission staff concludes that a modern weir that has an operable gate could never be an effective management tool in 2009 going forward.

But the prize in the above-cited paragraph is the last three sentences, which impute a causal connection between removal of the old weir and increased salmon returns. We cited in our REA Comments extensive documentation of the reasons for the resurgence of spring-run Chinook in Butte Creek, which were clearly later in time and completely unrelated to the removal of the old weir (see, for example, California Department of Fish and Game, *Butte Creek Department of Fish and Game Anadromous Fish Restoration and Calfed Programs*, 2005)

All weirs are not created equal. There may be a better way of managing risk to holding spring-run in Butte Creek than use of a resistance board weir such as that which is used on the Stanislaus. Frankly, we haven't seen it. Nor have we seen a serious response yet to our proposal of how to go about managing risk: not from the licensee, not from FERC, and not from the resource agencies. It may be that a weir is not needed to manage holding spring-run salmon if all the water below DeSabra Powerhouse is left in Butte Creek. No one has gathered the evidence to show that, ***any more than anyone has gathered the evidence to show that operation of Centerville Powerhouse is needed to manage holding spring-run salmon in Butte Creek.***

As a corollary to the above, use of a weir is a component of the least risky means that we can think of to gather such evidence, and in fact ought to be part of the object as well as the means of risk management analysis. In other words, a weir should be used to assist in the collection of substantial evidence about the migratory behavior and spawning success of Butte Creek spring-run, and the evidence gathered should also in part address how a weir might best be used (if at all) as an effective management tool.

## **An Environmental Assessment and a Biological Assessment founded on speculation**

As we noted above, the Commission had ample opportunity within the relicensing to evaluate many critical assumptions. However, having failed to do so, it is now compelled to rely on unsubstantiated conclusions that were stated in earlier documents. The Commission has thus fallen victim to its own dogmatic interpretation of the study plan requirements of its Integrated Licensing Process. In limiting studies on the front end, it is now without adequate information to support defensible conclusions in its environmental document.

Forming testable hypotheses is an integral part of science. Paul Ward, in *Butte Creek Spring-run Chinook Salmon, Oncorhynchus Tshawytscha Pre-Spawn Mortality Evaluation 2003*, drew a number of conclusions in 2004, the product of some outstanding scientific work to that point in time. Mr. Ward's conclusions would have been eminently appropriate to test as hypotheses during the relicensing process, and would have refined and extended his earlier scientific inquiry.

However, these conclusions were not stated as hypotheses. They were not tested. They were simply repeated over and over, from document to document, during a process that is supposed to formally uncover and mitigate the environmental impacts of a proposed project. That is not science. It is abdication to expedience.

### **Speculation, Part 1: The amount and significance of downstream migration to spawn, and the amount and significance of spawning habitat upstream and downstream of Centerville Powerhouse**

In each of the quotations below, bold italics have been added for easier reference.

Ward et al, in *Butte Creek Spring-run Chinook Salmon, Oncorhynchus Tshawytscha Pre-Spawn Mortality Evaluation 2003*, (published 2004), state on page 22:

Current diversions through the Centerville Powerhouse significantly decrease temperatures in Butte Creek below the Centerville Powerhouse, provide important holding habitat during the summer, and ultimately contribute to the maximum usage of spawning habitat. Based upon the recent evaluation of useable spawning habitat and an average redd area of 23 sq. ft. to 200 sq. ft., it is estimated that at 40 cfs, approximately 27—2352 adults spawn above the Centerville Powerhouse. Below the Centerville Powerhouse, at an average flow of 130 cfs, there is sufficient spawning gravel to accommodate approximately 1262-10976 adults. During 2003, approximately 1527 adults spawned above the Powerhouse and 4536 below. Evaluation of holding and spawning distribution since 2001, shows a net downstream movement from holding pools to spawning habitat. ***However, there is not significant movement from above the Centerville Powerhouse to below. The result is saturation of spawning habitat above and significant underutilization below.***

PG&E's *Preliminary Biological Assessment* (20050831-0135), on pages 4-6 and 4-9, states

As a result of snorkel survey estimates and post-spawning carcass counts, CDFG estimates the number of spring-run Chinook attempting to spawn in the reach above Centerville Powerhouse between 2001 and 2004 was 10,887, 7,161, 1,527 and 5,519, respectively (Ward et al. 2005)• Based on the available average redd sizes and recommended spawning areas (Table 4-2) ***the available spawning habitat was saturated, and likely resulted in redds being superimposed.***

***Studies by CDFG (Ward et al. 2004c) also indicate that no significant re-distribution of spring run Chinook holding upstream of Centerville Powerhouse to spawning habitat downstream occurs.*** In the four years from 2001-2004, CDFG determined that during the holding period between June and mid-September, approximately 65% of the observed spring-run Chinook held above the Centerville Powerhouse and 35% held below•

NMFS's *Preliminary Biological Opinion* (p. 38) picks up the theme:

As a result of snorkel survey estimates and post-spawning carcass counts, CDFG estimates the number of spring-run Chinook salmon attempting to spawn in the reach above Centerville Powerhouse between 2001 and 2004 was 10,887, 7,161, 1,527 and 5,519, respectively (Ward et al. 2005). ***Studies by CDFG ('Ward et al. 2004c) indicate that no significant re-distribution of fish holding upstream of Centerville Powerhouse to spawning habitat downstream occurs.*** In the four years from 2001-2004, CDFG determined that during the holding period between June and mid-September, approximately 65 percent of the observed spring-run Chinook held above the Centerville Powerhouse and 35 percent held below. For the same four year period, CDFG determined approximately 53 percent of the fish spawned in the reach above the Centerville Powerhouse and 47 percent spawned below. ***Based on an evaluation of available spawning habitat the available spawning habitat has been consistently overutilized in recent years, and likely resulted in redds being superimposed.***

And finally, we have the Draft EA/Biological Assessment, on pages 167 and 168:

***...there is little redistribution of salmon to downstream areas once spawning is initiated (NMFS, 2006). ...***

***This data indicates that the available spawning habitat upstream of Centerville powerhouse has been consistently over utilized in recent years, likely resulting in redd superimposition, reducing egg and pre-emergency fry mortality.*** Although increased MIFs from the Lower Centerville diversion dam ***would likely increase*** spawning habitat, as discussed below, ***it is likely that providing*** all flow downstream of the Lower Centerville diversion dam would not provide enough spawning habitat to accommodate the number of salmon attempting to spawn.

***Consistent with NMFS conclusions in the preliminary biological opinion, it appears that the spring-run Chinook salmon population has reached or exceeded its limits in this reach (NMFS, 2006).***

Two sentences in one document in 2004, two untested conclusions made by one man and his staff, are cited over and over not as hypotheses but as evidence. The conclusions are now carved in stone. Mr. Ward asserted that downstream migration was “not significant,” and it has become so. Mr. Ward postulated saturation of the spawning habitat upstream of Centerville, and it has also become so.

The language from the Draft EA bears added comment. Consider the language used on page 168: “***This data indicates ... likely resulting ... would likely increase ... it is likely that providing ... it appears that ...***” Perhaps it is carved soft stone. Note however, that in one respect the conclusion of Commission staff has become more definitive and less nuanced than the original formulation by Mr. Ward et al. Ward et al said downstream migration was “not significant.” Commission Staff says there is “little redistribution.” By any metric, the downstream migration of 20% of the fish upstream of Centerville (*Preliminary Biological Assessment*, p. 4-9) is not properly characterized in this way: in 2008, that would have been about 1300 salmon, if the pattern cited in the *Preliminary BA* held true.

Mr. Ward’s hypotheses, that migration from above the Powerhouse to below the Powerhouse is not significant, and that spawning habitat above the Powerhouse is “saturated,” may or may not be true. However, the ILP did nothing to test these hypotheses. The evidence collected for the Pre-Spawn Mortality Reports for 2004 and 2005 did not test ***movement*** of fish; it tested only where fish were seen holding and spawning, and where their carcasses were found. The evidence collected did not test how many ***smolts*** were produced above the Powerhouse; it only tested how many fish spawned above the Powerhouse and how that compared to a modeled quantification of spawning habitat. In neither case were thresholds of significance defined. The Commission simply deferred to the untested conclusions of local DFG staff.

**Speculation, Part 2: Release of additional water into the Centerville bypass reach will cause (over)crowding of fish**

Ward et al (2004, p. 20) state:

While the high temperatures during 2003 in the reach above the powerhouse were likely a key factor in the pre-spawn mortalities, the flow-temperature evaluation (PG&E, 1993) would suggest that increased flows would not have materially reduces the temperatures. ***Additionally increased flows would have increased temperatures below the powerhouse, likely causing those SRCS hold[ing] below to move upstream.***

PG&E (*Preliminary Biological Assessment*, p. 5-52):

Conversely, such an increase in the bypass flow would reduce the amount of cooler water delivered to Centerville Powerhouse, thereby reducing and increasing the temperature of Chinook holding habitat downstream. For example, the average July powerhouse flow would be reduced from 114 cfs to 74 cfs. As discussed in Section 5.3.1.6, ***reducing water delivery through Centerville Powerhouse not only would increase temperatures in the lower portion of the Chinook holding habitat, but it could increase the concentration of Chinook holding upstream of the powerhouse, exacerbating the overcrowding that already exists in the upper reach.***

PG&E, in its August 14, 2008 Reply Comments:

***In all probability***, these fish would not remain below Centerville PH under the Conservation Group's proposal, but would be induced to move upstream by ***these warmer water temperatures and higher attraction flows which would increase the concentration of adult spring-run Chinook above Centerville Powerhouse and exacerbate the already crowded conditions.*** (Attachment 6, pp. 2-3).

Finally, the Draft EA (p. 167):

***Additionally, further reducing temperatures above the Centerville powerhouse may result in more spring-run Chinook salmon overcrowding***, preventing the utilization of spawning habitat below Centerville powerhouse since there is little redistribution of salmon to downstream areas once spawning is initiated (NMFS, 2006). [note that, although the Draft EA cites NMFS at the end of this paragraph, NMFS didn't speculate on possible overcrowding, and said that there was no "significant re-distribution," not that there was "little redistribution"].

Repetition stands in for evidence once again. NMFS, to its credit, sat this one out. There's not one simple declarative statement in the bunch. There's "***likely causing***," "***it could increase***," "***in all probability***," and "***may result in***."

If the licensee and the Commission want to demonstrate scientifically what effect increased flow in the bypass reach will have on holding spring-run, they should decide on a plan to increase the flow and test a hypothesis or hypotheses. We remind those parties that a resistance board weir could be an important part of managing the risk that might otherwise tend to preclude the development of such a plan. Failing the resolve to do this, licensee and the Commission should openly acknowledge, whenever they speculate, that their speculation is speculation. And the Commission should remove this speculation when it produces a Draft EIS.

### **Steelhead: the forgotten salmonid in the DeSabra relicensing**

The Study Plan Determination (20050817-3034) issued by the Commission for this proceeding utterly failed to provide any provision for the gathering of fish population data for adult steelhead in Butte Creek. Inexplicably, NMFS requested fish population

sampling for adult steelhead downstream of Centerville Powerhouse, but not in the Bypass Reach upstream. Equally inexplicably, Commission Staff refused to order any sampling of adult steelhead, in part because “existing fish population data (including steelhead) in this river reach are available from CDFG,” and in part because it determined that “snorkeling, while a generally accepted practice for surveying fish populations, is unsafe under the high flow conditions that exist from October-April and staff cannot require such sampling efforts” (Study Determination, p.15).

No fish population data for adult steelhead was produced for the record by CDFG or anyone else. Anglers, who are allowed to fish in Butte Creek only from November 15 through February 15, seemed to be able to find water conditions low enough to allow wading, and were able to provide the “limited visual observations” cited in the Draft EA. The “high flow conditions” that would ostensibly prevent snorkeling are highly variable, and a snorkeling effort was certainly feasible, if not always predictable in respect to timing. Butte Creek also clears relatively quickly in comparison with many other steelhead streams.

The limited visual observations of Friends of Butte Creek, a number of whose members fish frequently during fishing season, suggest that numbers of steelhead have diminished significantly in the last several years.

Summer/fall surveys of the number of *O. mykiss* present in Butte Creek were not limited by absence of effort. However, while there is discussion in the Draft EA of IFIM modeling, there is no analysis of the way that *O. mykiss* that are present in the summer system actually use the habitat. There is also no analysis in the Draft EA of how predators of juvenile *O. mykiss* use the habitat and respond to the effects of the project, and how this affects the potential recruitment pool for Central Valley steelhead

Consider Lower Butte Creek to be divided into two reaches: from Covered Bridge upstream to Centerville Powerhouse as the lower reach, and from Centerville Powerhouse upstream to Lower Centerville Diversion Dam as the Bypass Reach. Within each of the reaches, the ratio of *O. mykiss* to cyprinids increases from one survey site to the next as one moves upstream. The greatest number of cyprinids is in the downstream-most site in the Bypass Reach (Helltown). The greatest number of *O. mykiss* is in the upstream-most sites of the Bypass Reach (Quartz Bowl and just downstream of Lower Centerville Diversion Dam).

By way of an explanation that does not appear clearly in the Final License Application, the juvenile cyprinids surveyed by the licensee are not always readily identifiable by species; specifically, juvenile Sacramento pikeminnow and hardhead were difficult to distinguish, especially in snorkel surveys. Populations of adult Sacramento pikeminnow greatly outnumbered populations of adult hardhead in the 2006 Butte Creek survey.

Large Sacramento pikeminnow are known voracious predators of juvenile salmonids.



Based on the information available, the following conclusions can be drawn about the critical habitat of Central Valley steelhead in Butte Creek:

Weighted usable area for juvenile *O. mykiss* in the Bypass Reach of Butte Creek is at 100% of maximum at 100-110 cfs. WUA is at 80% of maximum at 45 cfs and 190 cfs, and at 70% of maximum at 250 cfs. Predators of juvenile *O. mykiss* have an abundant nursery at Helltown, the downstream-most fish population site surveyed by the licensee in the Bypass Reach and the area most impacted by project-affected water temperature conditions. *O. mykiss* population at the same site was very low. Fish population composition shows increase populations of salmonids in colder areas and of pikeminnow in warmer areas. Overall populations of juvenile *O. mykiss* appear to be more dependent on water temperature than on habitat as measured by weighted usable area.

The project therefore appears to be diminishing the quality of critical habitat for Central Valley steelhead in the Centerville Bypass Reach.

Note that under Conservation Groups' Alternative, modeled summer water temperatures downstream of the present location of Centerville Powerhouse show a mean daily decrease of .10° C, and the Alternative would therefore not diminish the present quality of habitat for juvenile *O. mykiss* in that downstream reach.

The Commission should explicitly address in its draft EIS/Biological Assessment this known information about the impacts of the project on juvenile *O. mykiss* in Butte Creek downstream of Lower Centerville Diversion Dam. NMFS's Biological Opinion should also address and analyze the significance of this information under Section 7 of the Endangered Species Act.

Please see the Appendix to this document for graphs of fish survey population results from licensee's 2006 surveys on Butte Creek.

### **Fish passage, entrainment and alleged canal habitat**

Commission Staff states, on page 216 of the Draft EA:

We find that the Forest Service's use of 830 rainbow trout per acre as a target reference for healthy rainbow trout populations on Northern Serrian [sic] National Forest System Lands provides a noble goal for the Forest Service to strive toward when applying fishery management measures on their lands. However, applying this goal as a target that must be met or result in the mitigative measure to be carried out solely by PG&E until the goal is met, is not appropriate.

However, at the end of the day, Staff has recommended no fish passage facilities anywhere in the project, almost no monitoring of fish populations, and has justified it all by saying that "the trout populations above and below these project facilities are viable and generally healthy" (p. 377).

“Viable,” literally the notion that not all of the fish die, is not consistent with the equal consideration standards of Section 10(a) of the Federal Power Act. If the Commission wishes to propose an alternative means of evaluating trout populations in Sierra streams or some portion of Sierra streams, then the Commission should propose an objective standard for fish populations and defend it against the standard proposed by the Forest Service. As a member of Commission staff once admonished one of the parties to this filing, the Commission should “put a number on it.”

The analysis on pages 213 and 214 of the Draft EA that was used to reach this conclusion is even more shameful. The “mean condition factor” used to determine that the fish affected by the project are “generally healthy” is based on fish recovered from project canals during fish rescues. In footnote 43, page 214, we learn that the condition of fish in project canals is meaningful because “the canals are not screened and these fish could move freely to project stream reaches.” Therefore, Staff continues, “we find that the condition factor represented for fish sampled from the canal system is likely representative of those residing within the project affected [sic] stream reaches.” So: fish populations in project stream reaches are “likely” “generally healthy” because *the fish entrained into the project canals* have a mean condition factor of 1.17 and 1.05-1.14 respectively (rainbows and browns). This is the sole objective analysis that Staff puts up against the numeric standards proposed by the Forest Service.

That’s appalling in itself, but it gets worse. As we have pointed out on several occasions, most extensively in Comments on the Draft License Application (CSPA, FBC and FOR, 20070904-5001), licensee has provided the only evidence on the record that discusses whether fish can leave project canals, and licensee’s own document says that velocities at the headworks of all three major project diversions are too great for trout to exit these canals. We quote from page 6 of our comments on the Draft License Application at length:

Equally outrageous is the fact that this line of argument’s contention of free movement by trout in and out of project canals is flatly contradicted by one of the other relicensing studies. Even if one were to accept – and we don’t – that it would mean something if fish could exit the canals and re-enter the respective streams if they so chose, the Assessment of Fish Screens PowerPoint, presented to relicensing participants on June 28, 2006 (as noted at the bottom of page E6.3-155 in the DLA), frankly and explicitly says that the present configuration of all three major project diversions precludes this:

Slide 15, “Butte Creek Diversion Dam Engineering and Construction Challenges,” seventh bullet states: “Tunnel and headgate velocities are too high for fish passage.” Slide 37, “Lower Centerville Diversion Dam Proposed Screen & Ladder Used,” states, in the fourth bullet: “The headworks and a portion of the canal would be modified to reduce flow velocities in the fish ladder/screen approach channel.” Slide 24, Hendricks Diversion Dam Engineering & Construction Challenges,” states in the third bullet: “Headgate velocities are too

high for fish passage,” and in the fifth bullet: “Will require modifications of the gates and portions of the canal to pass fish.”

Just so that they’re not forgotten, we call attention as well to the fact that there are also tunnels on the Hendricks and Lower Centerville Canals, and that the Hendricks tunnel under Stirling City is over a mile long and begins just a mile downstream of the Diversion.

Licensee answered many of our comments throughout this proceeding, but never got around to addressing our discussion of its *Assessment of Fish Screens*. We ask that Staff do so now, and provide a hydraulic analysis that proves what has now become *the Commission’s* contention that fish exit project canals at will, and also that they can “move upstream and downstream within sections of each canal” (Draft EA, p. 121).

Failing that, a proper draft EIS should exclude any analysis based on discussion of fish in project canals, and accordingly should re-evaluate its balancing regarding entrainment and fish passage. We also respectfully request that the Commission address, as part of its clarification of its objective standards for fish population analysis, and in order to make clear how Commission staff balances fishery issues, our longstanding and underlying position that fish do not belong in canals, as stated in the same Draft License Application comments:

We’re sorry, but we hold it to be a self-evident truth that fish belong in rivers or streams, as opposed to the canals associated with hydroelectric projects (and almost all other canal uses, for that matter). Fish in a canal are inherently a negative impact of that water development. (20070904-5001, page 6)

Finally, the Commission should also reconsider its balancing and order a fish ladder and a fish screen at Hendricks Diversion Dam, since most flow options for the West Branch Feather River are not acceptable given the benefits of water exported to Butte Creek. The Commission should also order installation of a fish screen at Lower Centerville Diversion Dam, if and when the Commission and licensee definitively decide not to decommission the Centerville Development. Commission Staff failed to give steelhead recruitment appropriate weight in its analysis regarding the screening of Lower Centerville Diversion; Staff should order a screen on this basis alone. NMFS should also address this issue in its Biological Opinion for Central Valley steelhead.

## **Monitoring**

Two years of monitoring immediately after a flow change, as suggested as a default in numerous places in the Draft EA and most notably on page 380 in regards to anadromous fish, is not sufficient to protect instream resources, particularly in consideration of climate change. As suggested by the resource agencies, the Commission should order long term monitoring of aquatic species, and not only of water temperature and water quality, in addition to monitoring immediately after a flow change. The objective of water temperature monitoring is foremost to protect aquatic species, and, in this project,

to protect spring-run Chinook salmon and anadromous or potentially anadromous O. mykiss in particular.

In its Study Plan Determination for the Yuba-Bear/Drum-Spaulding relicensing (FERC projects #2266 and #2310, coordinated relicensing process), the Commission noted that “where a designated beneficial use of project waters is to maintain or enhance coldwater fisheries, the Commission frequently includes water temperature monitoring in project streams and reservoirs as a license condition. Such monitoring of actual conditions, in association with input from water and land management agencies and fish and wildlife agencies, would enable responses to climate change to be incorporated into license conditions and, if needed, license amendments” (20090223-3023, p. 25). Since the Commission is now on the record refusing a climate change study within a relicensing, and is on the record stating that it will instead use monitoring as a backstop to address the effects of climate change, the need to monitor affected biological resources as well water resources over the entire term of every license is imperative.

## **Turbidity**

The Draft EA maintains on page 384 that the turbidity sensors recommended by Conservation Groups in our REA Comments are unnecessary:

We do not recommend the Conservation Groups recommendation for PG&E to install turbidity sensors at four locations on Butte Creek between DeSabra powerhouse and immediately downstream of Centerville powerhouse. We conclude that our recommendation for PG&E to conduct turbidity monitoring in receiving streams prior to, during, and after canal outages, as described above, would allow for any increases in turbidity related to Project operations to be identified. Installing sensors in Butte Creek would allow for more turbidity data to be collected; however, it may be difficult to differentiate between increases in turbidity levels associated with natural conditions (i.e., rainfall) or Project-related increases. Also, we estimate the total annual cost of installing and maintaining these turbidity sensors would be \$8,420 and conclude that the environmental benefits do not justify the additional cost.

Staff misunderstands the purpose of proposing these sensors. Conservation Groups propose these sensors as an early warning system for canal failure or other project anomalies. The goal is not to assign blame for turbidity events, or to quantify turbidity in order to assign a penalty after the fact. The goal is to allow quick detection and correction of problems.

In three recent turbidity events, licensee was alerted to the fact of a serious problem with its facilities because high turbidity was noticed by members of Conservation Groups who live in Butte Creek Canyon. On May 11, 2003, a large scale failure of the Lower Centerville Canal was called to the attention of PG&E by Butte Creek Canyon residents. Flow was 850 cfs, water was clear prior to the slide, and weather was also clear. Three

days later, dead adult salmon were found along Butte Creek. On October 10, 2007, on a clear day with flow at 141 cfs and clear water in Butte Creek, a large amount of turbid water was released from the Centerville spill channel into spawning salmon. On January 14, 2008 was an event that came to be known as the “canal slump.” Part of the Lower Centerville Canal failed, washing material into the creek. Weather was clear, creek flow at the time was 329 cfs, and water in the creek was clear before the muddy water from the slump entered the creek.

Relying on concerned local people to call licensee in the event of a facility failure is not an adequate protection measure. Conservation groups strongly disagree with Staff’s economic decision: considering the value of the resource, the annual cost is easily justified. Further, Conservation Groups believe that such sensors could very well be cost-efficient for licensee: early detection of one canal failure could cause our proposed turbidity monitoring sensors to pay for themselves by minimizing both the extent of repairs and canal downtime.

The Draft EA also finds that our proposal that licensee remediate the upper portion of the spill channel just above Centerville Powerhouse is not necessary. We find this to be particularly difficult to understand considering the emphasis placed by the Commission and by licensee on the spring-run Chinook that hold just downstream of the tailrace of Centerville Powerhouse. Large numbers of spring-run also spawn in this immediate area. The outfall from the spill channel is just upstream of the tailrace.

In a relicensing meeting on April 24, 2007, Jim Bundy of PG&E informed relicensing participants (including FERC representative Aaron Liberty, who participated by phone) that the Centerville Powerhouse faced a prospective long term outage in the Summer of 2007. This is noted in the meeting summary, on page 3. Not in the summary is the fact that Mr. Bundy expressed concern that a long term outage might require a prolonged use of the spill channel at about 120 cfs, and that the spill channel was not in a condition that Mr. Bundy, who is in charge of the day to day operation of the project, felt comfortable with for such a prolonged high flow. In its analysis on page 58 of the Draft EA, Staff states: “The Conservation Groups do not provide significant information in their comment letter that indicates that a problem still exists at the spill channel located above the Centerville powerhouse.” On the contrary, we believe that the statements by licensee staff constitute eminently “significant information.” The Draft EA cites PG&E’s reply comments regarding this matter. The quote (from 20080814-5057, Attachment 6, page 5) is:

PG&E conducted a study of the spill channel to develop recommendations for spill channel stabilization and to reduce turbidity effects as a result of spill channel operations. During 2005, PG&E implemented remediation measures recommended by the study and considers the spill channel to be stable and functioning well. PG&E believes further upgrades to the spill channel are unnecessary at this time.

A report which led to measures taken in 2005 does not address the concerns stated by licensee staff, in the presence of FERC Staff, in April of 2007, specifically those issues relating to prolonged high volume discharges, regardless of what licensee's responders may have said in more general terms in August of 2008. If Commission Staff performed a site visit to investigate this issue, or bases its information on some other study, it should describe this in its draft EIS. Otherwise, since there is conflicting information from licensee staff, the Commission should make its own inquiry, and not simply take the latest word of the licensee. The germaneness of Conservation Groups' failure to provide a cost estimate (p.58) for remediating this problem escapes us. This is not a study plan: this is a known condition that may result in the take of listed species. Take could possibly be on a large scale, especially if large amounts of sediment are discharged onto incubating eggs. It is Staff's responsibility under NEPA to analyze and quantify reasonably foreseeable expenses that will result from the deteriorated condition of licensee's facilities. Further, Staff has acknowledged licensee's statement that Centerville Powerhouse will need to be refurbished in the next ten or less years. Just because licensee narrowly missed a serious problem in 2007 does not mean that it is reasonable or prudent to assume it will continue to avoid prolonged outages which stem from a known condition of deterioration.

NMFS, in its Section 7 consultation, should also address the issue of possible take resulting from the combination of a prolonged shutdown of Centerville Powerhouse and the condition of the spill channel just upstream.

### **Stream Access and Law Enforcement**

Conservation Groups appreciate the fact that Commission Staff has acknowledged the importance of providing public access to the Centerville and DeSabra powerhouse areas. We agree with Staff's statement that "there are several methods that may be employed to limit trash dumping and ensure public safety, such as placing the gates further down the road and posting signage to prevent trash dumping and encourage pedestrian access" (p. 275). We continue to disagree with PG&E's position that concerns about safety and the dumping of trash warrant the denial of public access to river reaches within the project.

Conservation Groups feel that it is inconsistent for the Commission and the licensee to claim that the state and local taxes paid by the licensee should be adequate to fund local law enforcement, and then deny the public access because of a lack of law enforcement on the project.

In order to address concerns stated by both the Commission and the licensee that a sheriff's deputy funded by the licensee might be used for purposes not related to the project, Conservation Groups suggest that, instead of a deputy, a project patrol officer could significantly improve access and related issues. Additionally, a project patrol officer could be in charge of opening and closing gates on roads leading to DeSabra Powerhouse. This would avoid the need to implement PG&E's recommended solution for recreational access, a complex and perhaps even untenable process to distribute keys to certain members of the public.

Regarding the management of this access, Conservation Groups continue to recommend that PG&E hold an annual meeting to discuss access management. We suggest this approach rather than taking a year to develop an access plan. In our experience, such plans are often delayed, and also often fail to provide needed guidance in dealing with the on-the-ground issues. An annual meeting of licensee and recreation stakeholders could be effective immediately.

### **Project Economics**

We have discussed above the lack of clarity surrounding the economic baseline of the proposed action, most notably whether the expected cost of refurbishing the Centerville Powerhouse was accounted for, and if so, how. The draft EIS should clarify how it accounts for this expected cost.

The Draft EIS should also explicitly reference the June, 2006 “Letter of Understanding” signed by licensee and senior agency managers from CDFG, the Forest Service, NMFS and the Fish & Wildlife Service, and state how, if at all, the agreed upon objective, that “The Project would be relicensed with a forecast cost-of-production that is competitive with market rates for alternative power,” has influenced the Commission in the balancing of interests and costs employed in making its determination.

### **Conclusion**

The draft Environmental Assessment should be re-issued as a draft Environmental Impact Statement, incorporating the Conservation Groups’ Alternative, as presented in our June 27, 2008 REA Comments, as an alternative under NEPA.

The Commission should, as part of its consultation with the National Marine Fisheries Service, determine the extent of information that is lacking in order to complete the consultation, and should make plans to gather needed information in a manner that is both thorough and expeditious, in order to provide a complete biological assessment. The draft EIS should eliminate the speculation contained within the draft EA regarding spring-run Chinook salmon. In particular, it should eliminate speculation regarding migration behavior of Central Valley spring-run Chinook, production of spring-run upstream and downstream of Centerville Powerhouse, the likelihood of the crowding of spring-run in conditions of increased flow into the Lower Centerville Bypass Reach, and the physiological effects of thermal stress on adult spring-run and juvenile steelhead, as we have described above. Conservation Groups recommend that, consistent with our Alternative, the Commission develop a plan to evaluate spring-run migration, productivity, and potential crowding under increased flow conditions downstream of Lower Centerville Diversion Dam, and also the physiological effects of thermal stress on both spring-run and steelhead. We recommend that the Commission develop this plan with the involvement of all relicensing stakeholders, and that it use the information gathered to develop license conditions.

The draft EIS should analyze all relevant available data regarding juvenile O. mykiss in Butte Creek, insofar as this data bears on the possible production of Central Valley steelhead.

The draft EIS should eliminate from consideration analysis based on the erroneous conclusion that fish can exit project canals at their headworks, and reconsider passage options accordingly.

The draft EIS should set forth the Commission's numeric standard(s) for trout populations in California's Sierra Nevada mountains, or for the northern Sierras, or for whatever geographical area the Commission can defend in the context of the DeSabra – Centerville Project, and should set forth its rationale both for biology and for geography.

The draft EIS should set forth the Commission's position on alleged fish habitat in the canals associated with hydroelectric projects, as discussed above.

The draft EIS should specifically relate proposed monitoring under a new license to climate change.

The draft EIS should clarify the baseline economic issues that are not clear in the Draft EA, particularly those regarding the cost of replacing Centerville Powerhouse.

Thank you for the opportunity to comment on the Draft EA for the DeSabra – Centerville Project relicensing.

Respectfully submitted,

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

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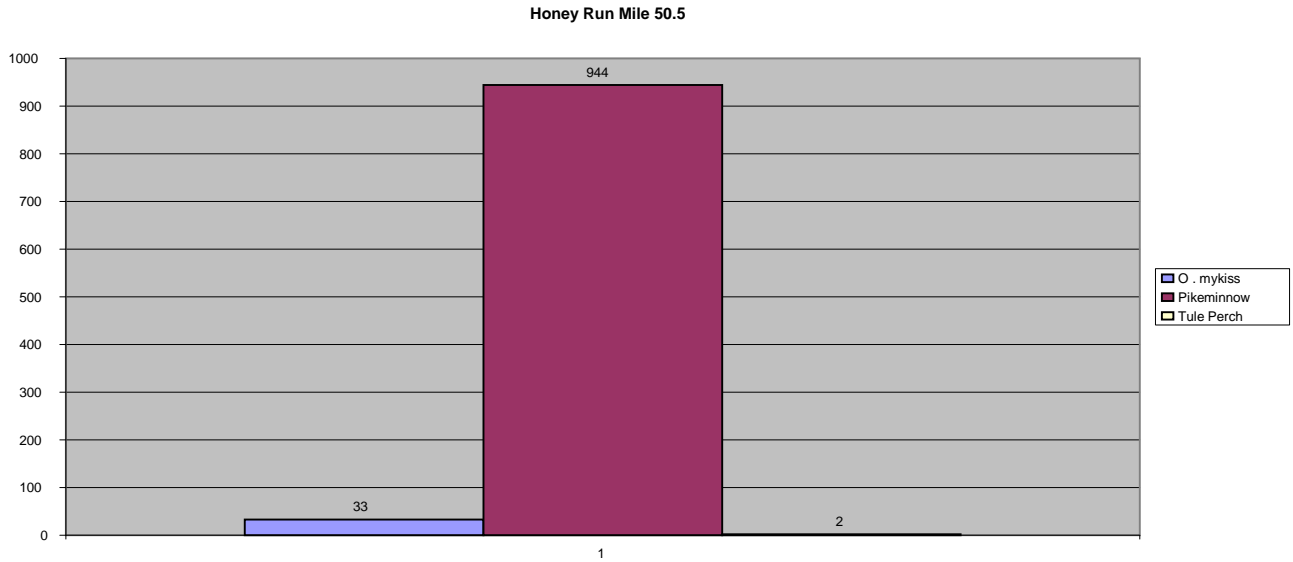
cc:  
Trent Orr, Earthjustice  
David Moller, Pacific Gas & Electric Co.  
Russ Strach, National Marine Fisheries Service

## APPENDIX

**From  
Final License Application  
APPENDIX E6.3.2.2-A1  
Stream Site Direct Observation Data, 2006.**

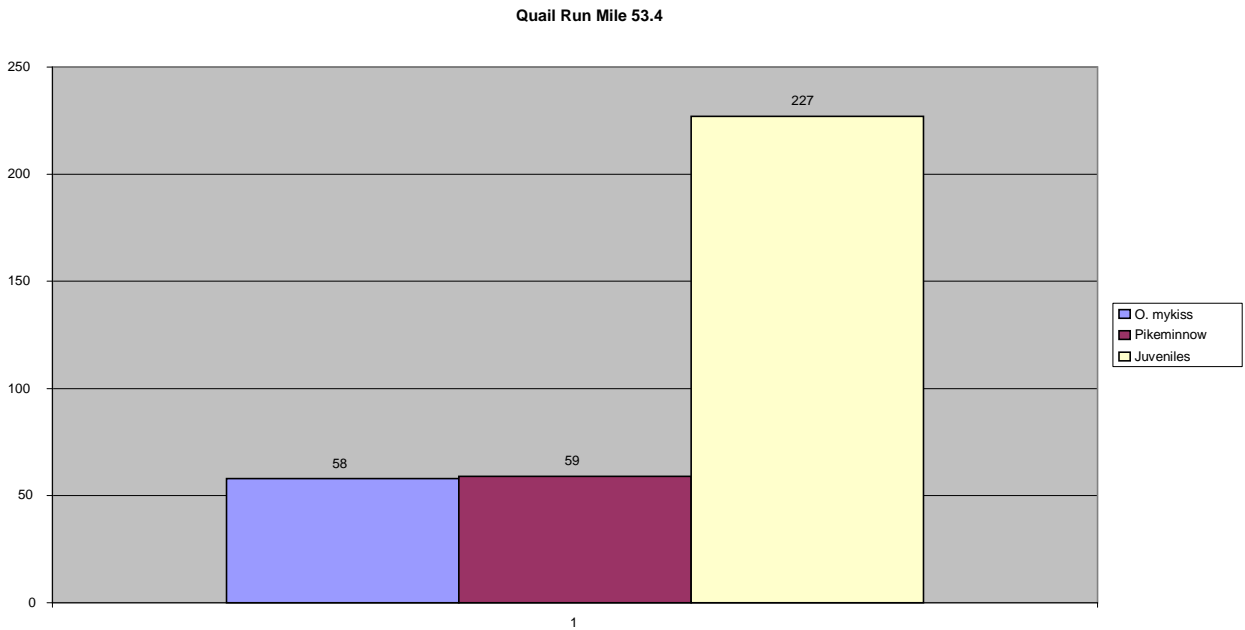
**Details of the Fish Population Survey in Butte Creek from  
Covered Bridge to Lower Centerville Head Dam  
(Anadromous Reach: Critical Habitat for  
Central Valley spring-run Chinook and Central Valley steelhead)**

**Honey Run Pool Mile 50.5 Lower End of Reach Below Centerville**



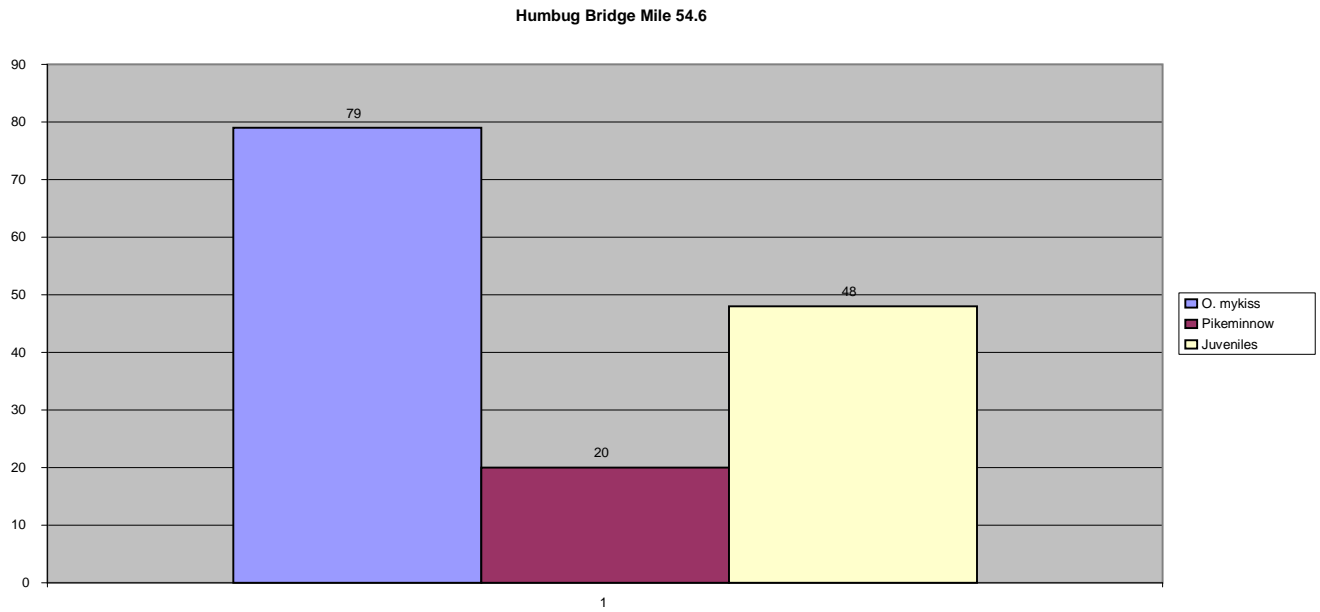
The Honey Run survey found twenty-eight times more pikeminnow than O. mykiss  
**O. mykiss – 33    Pikeminnow – 944    Tule Perch - 2**

**Quail Run 53.4 Middle of Reach Below Centerville**



The Quail run site revealed an almost equal number of O mykiss and pikeminnow,

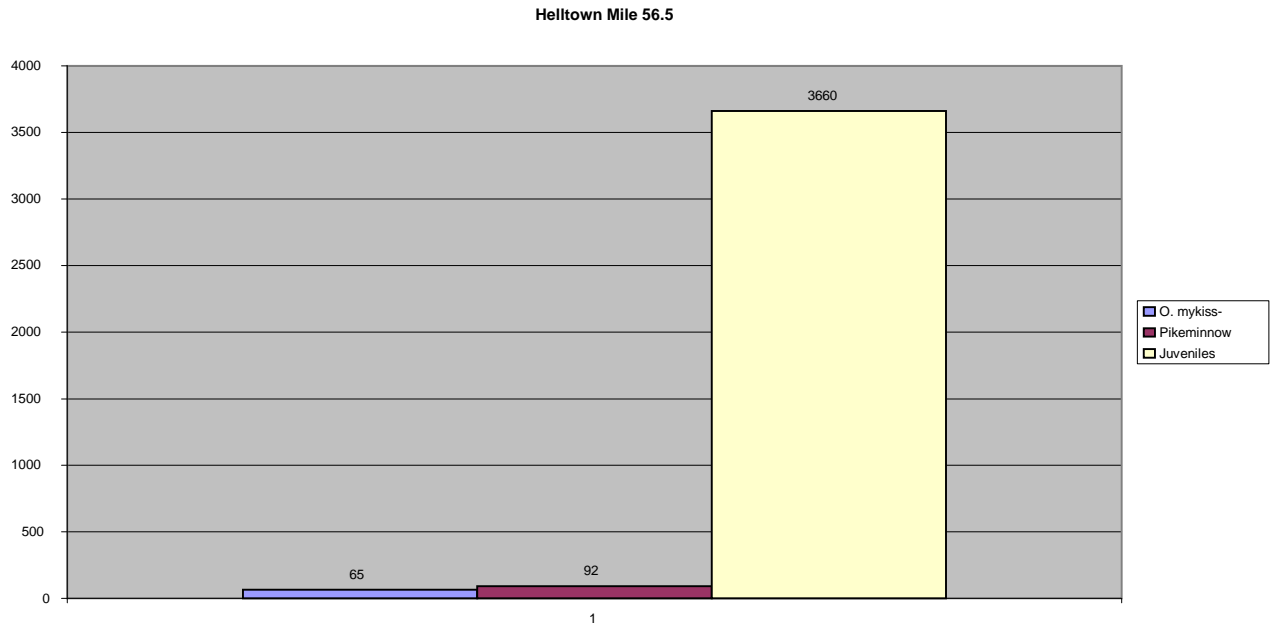
with a significant number of juvenile Cyprinids.  
**O. mykiss – 58 Pikeminnow - 59 Juvenile cyprinids - 227**  
**Humbug Bridge Mile 54.6 Upper End of Reach Below Centerville**



The Humbug Bridge site, the coldest section surveyed in the reach below Centerville, contained more O. mykiss than pikeminnow and far fewer juvenile cyprinids.

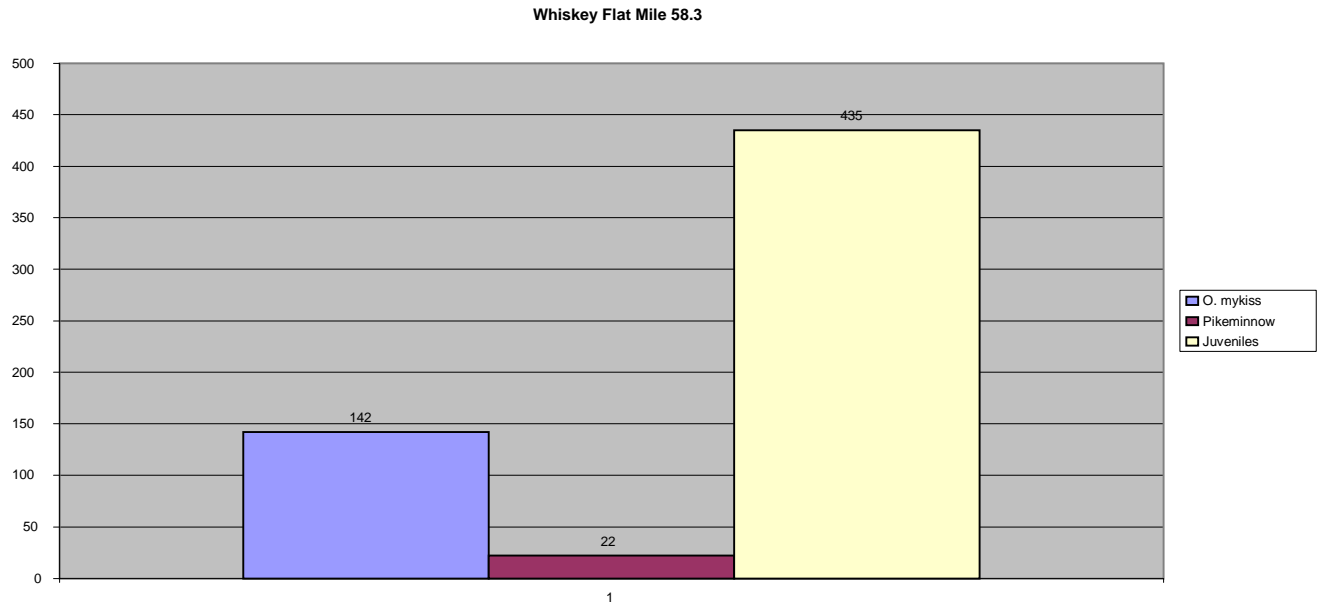
**O. mykiss – 79 Pikeminnow - 20 Juvenile cyprinids - 48**

**Helltown Mile 56.5 Lower End of Centerville Bypass Reach**



The Helltown site, with the warmest water of the survey sites in the Bypass Reach, is a prolific breeding area for the predatory pikeminnow.

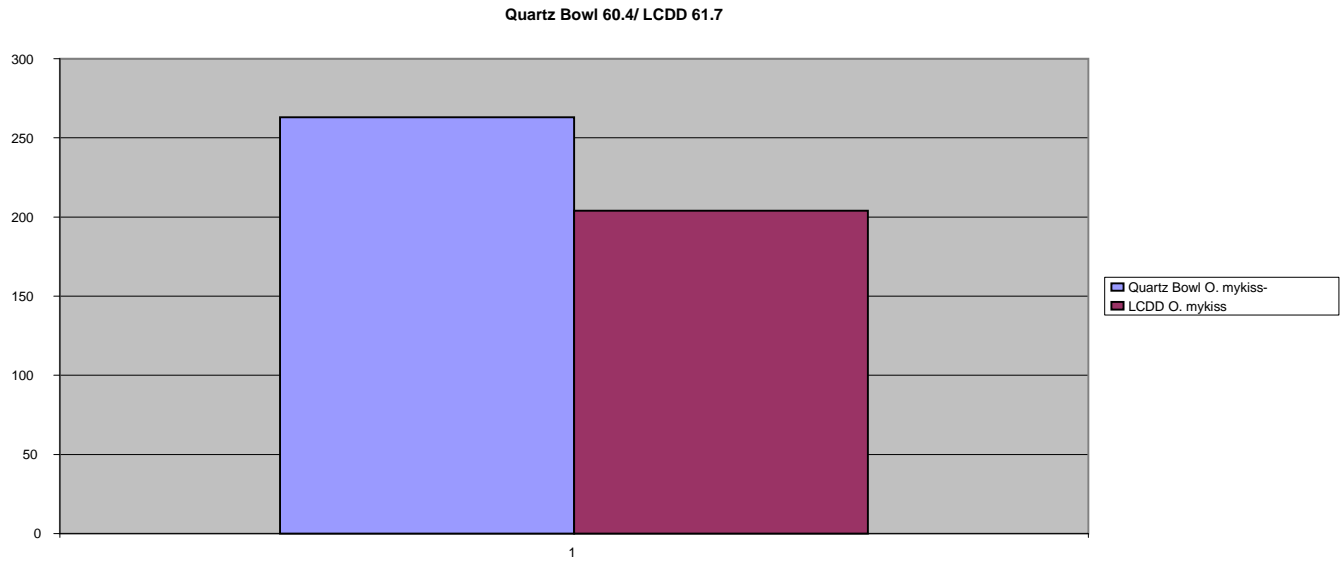
**O. mykiss – 65    Pikeminnow - 92    Juvenile cyprinids - 3660**  
**Whiskey Flat Mile 58.35 Middle of Centerville Bypass Reach**



The middle site of the Bypass Reach is cooler and has a higher ratio of O. mykiss to pikeminnow. There is still a significant reproduction of pikeminnow in this area

**O. mykiss – 142    Pikeminnow - 22    Juvenile cyprinids - 435**

**Quartz Bowl/Lower Centerville Diversion Dam Miles 60.4/61.7  
 Upper End of Centerville Bypass Reach**



The upper end of the Bypass Reach has the coldest water of the two reaches. *O. mykiss* numbers are robust, while cyprinids were not observed at all in this section.

**Quartz Bowl: *O. mykiss* - 263 Pikeminnow – 0 Juvenile cyprinids - 0**  
**LCDD: *O. mykiss* - 204 Pikeminnow – 0 Juvenile cyprinids – 0**

**Certificate of Service**

I hereby certify that I have this 26th day of February 2009, served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding under FERC Project No. 803.

Carla Miner  
Stewardship Assistant  
American Whitewater  
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West Valley City, UT 84119

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