UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

IN THE MATTER OF:	)	**DOCKET NUMBER**
	)	
DON PEDRO HYDROELECTRIC PROJECT	)	
(Modesto Irrigation District	)	
and Turlock Irrigation District)	)	**FERC PROJECT NUMBER:**
	)	
	)	2299-000, -053, -065

STATEMENT OF
NATIONAL MARINE FISHERIES SERVICE,
U.S. FISH AND WILDLIFE SERVICE,
CALIFORNIA DEPARTMENT OF FISH AND GAME,
AND
CONSERVATION GROUPS
REGARDING REPORT TO THE COMMISSION BY ADMINISTRATIVE LAW JUDGE CHARLOTTE J. HARDNETT IN DON PEDRO PROJECT REHEARING

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I.
INTRODUCTION

Pursuant to the Federal Energy Regulatory Commission's (FERC or Commission) Order On Rehearing, Amending License, Denying Late Intervention, Denying Petition, And Directing Appointment Of A Presiding Judge For A Proceeding On Interim Conditions[1] (hereafter, Order on Rehearing), and subsequent Order Clarifying Proceedings,[2] the National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Game (collectively, "the Resource Agencies"), and the Tuolumne River Preservation Trust, Friends of the River, California Trout, Inc., and California Rivers Restoration Fund (collectively, "the Conservation Groups) hereby provide comments on the Final Report of the Administrative Law Judge on Interim Measures[3] in the matter of *Turlock Irrigation District and Modesto Irrigation District* (P-2299-065, -053). The Resource Agencies and Conservation Groups commend the Commission for its recognition that, "in light of the presence of [Endangered Species Act] listed steelhead and the serious decline of fall-run Chinook salmon that is occurring, there may be a need for interim protective measures pending relicensing,"[4] and for thus initiating this fact-finding process. The Resource Agencies and Conservation Groups offer their scientific and technical expertise to assist the Commission in reaching well-reasoned solutions to the imminent threats to fish populations on the lower Tuolumne.

Our comments are organized into seven sections, starting with this Introduction as Section I. Section II provides the background on the Proceeding; Section III summarizes the legal and regulatory context for this proceeding; Section IV provides our general comments on the treatment of the hearing record; Section V provides our responses to specific findings; Section VI states our request for further relief from the Commission; and Section VII provides our remarks in conclusion to this proceeding.

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[1] 128 FERC ¶ 61,035 (July 16, 2009).

[2] e-Library No. 20091203-3006 (December 3, 2009).

[3] 129 FERC ¶ 63,015 (Nov. 20, 2009) [hereinafter Final Report].

[4] Order on Rehearing at 61,155.

II.
BACKGROUND

In 1964, the Commission granted Modesto Irrigation District and Turlock Irrigation District (the Districts) a major license under Section 4(e) of the Federal Power Act (FPA) to construct, operate, and maintain the New Don Pedro Project (DPP or Project) on the Tuolumne River.[5] The Project's purposes included not only irrigation and municipal water supply, hydroelectric power, flood control, and recreation, but also fish and wildlife conservation.[6] Issues regarding fish and the flows in the Tuolumne River required to protect them were contentious during the original licensing proceeding. Fishery information constituted the bulk of the evidence in the licensing proceeding record, and after more than forty years of inconclusive information-gathering, water flows for fish survival remain the focus of the parties' disputes today.

A. The Commission designed fish flows in the 1964 License to maintain pre-license salmon runs of 40,000 and initiated a study process for fish conservation.

In the course of the original licensing proceeding, the Commission found that the average run of salmon in the Tuolumne River was 40,000 from 1940 to 1961.[7] The Commission determined that in order for the 1964 License to be best adapted to a comprehensive plan of development, as required under FPA section 10(a),[8] it should be conditioned on the release of water for the benefit of fish:

> In our judgment [fish water] releases are required as hereinafter prescribed if the project is to be found to be best adapted to a comprehensive plan for development of the waterway, since only by making the releases a condition of the license can we be sure that the project will be operated so as to utilize the available water in the best interest of all parties and provide the best plan for comprehensive development for all public uses.[9]

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[5] *Re Turlock Irrigation District,* 31 FPC 510 (Mar. 10, 1964) (1964 License).

[6] *Id.*

[7] *Id.* at 516.

[8] 16 U.S.C. § 803(a).

[9] *Re Turlock Irrigation District,* 31 FPC at 515.

Acknowledging the need for more information on which to base protective fish flows, the Commission in Article 37 established a twenty-year term minimum flow schedule (MFS) for "fish purposes," and required the Districts to study the Tuolumne River fishery and how it could feasibly be sustained. Supplementing the existing environmental information, Article 39 of the 1964 License required the Districts, in cooperation with California Department of Fish and Game (DFG), to make necessary studies aimed at "assuring the continuation and maintenance of the fishery of the Tuolumne River in the most economical and feasible manner."[10] After the first twenty years, the Commission reasoned, the parties would develop sufficient information about salmonids' needs to set protective flows more precisely. The Commission explained, "…it is our intention that the parties be encouraged to cooperate in continuing studies of the fish problem and to coordinate their efforts in seeking a mutually satisfactory solution in the future. Further releases will therefore be determined only after further hearing to consider the results of the parties' own efforts to solve the problem."[11] This conditional flow schedule was intended to maintain an average run of 40,000 salmon.[12]

The license further provided in Article 37 that, after the first twenty years of Project operation, with the benefit of additional environmental information, the Licensees would maintain MFS as "may be prescribed hereafter by the [Commission] upon its own motion or upon recommendation of the Secretary of the Interior or the California Department of Fish and Game" after notice and opportunity for hearing and based upon certain findings.[13]

B. After more than twenty years of study, the 1987 License Amendment sought ten additional years' worth of fishery information on which to base protective flows.

In the course of considering a license amendment in 1987, the Commission agreed, at the request of the Districts, DFG, and U.S. Fish and Wildlife Service (FWS), to have the Districts

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[10] *Id.* at 526.

[11] *Id.*

[12] *Id*. at 516.

[13] *Id.* at 526.

conduct ten additional years of fishery studies, ending in 1998. During this additional study process, the Commission left in place the MFS required under the 1964 license.[14]

C. The 1995 Settlement Agreement required additional flows to protect fish resources and provided for further study.

On March 19, 1992, the Districts submitted an application to amend the Project license to implement an agreement with DFG in which the Districts agreed to increase the MFS for fish protection. After negotiations, the Districts and other parties entered into the "New Don Pedro Proceeding P-2299-024 Settlement Agreement" (1995 Agreement). The 1995 Agreement required that flow and non-flow measures be employed to implement a recovery strategy which would: (1) increase naturally occurring salmon populations, (2) protect any remaining genetic distinction, and (3) increase salmon habitat in the Tuolumne River.[15] Such measures also were to be used to achieve the following comparative, rather than numerical, goals which were stated as follows: (1) improvements in smolt survival and successful escapement in the Tuolumne River, (2) increase in naturally reproducing Chinook salmon in this sub-basin, and (3) barring events outside the control of the participants to the settlement, by 2005 the salmon population should be at levels where there is some resiliency so that some of the management measures described herein may be tested on an experimental basis.[16]

The 1995 Agreement also established the Technical Advisory Committee (TAC) and its Management Committee. The TAC required consensus to operate, and was assigned to coordinate flow and non-flow measures for the fishery and monitoring activities, develop adaptive management strategies, and oversee their implementation. The Management Committee, composed of management representatives of the Districts, DFG, FWS, and the City of San Francisco, also required consensus. It was designed to oversee all TAC activities, request and receive recommendations from the TAC, resolve TAC issues, and make policy decisions.[17]

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[14] *See* 38 FERC ¶ 61,097 at 61,249.

[15] *See* 1995 Agreement at ¶ 8.

[16] *See id.* at ¶ 9.

[17] *Id.* at ¶14.

On February 5, 1996, the Districts filed a conforming application to amend the project license to "revise the license to release higher minimum flows [based on the results of the Article 39 study] to protect Chinook salmon in the lower Tuolumne River and to monitor fish resources under the new minimum flow regime and other management changes in the Tuolumne." The Commission approved the license amendment, and Articles 37 and 58 were revised accordingly.[18]

The amended Article 37 required the Districts to release marginally higher minimum flows for "fish purposes."[19] The Order also incorporated by reference the requirements in the 1995 Agreement that all flow schedules include a pulse flow to assist young salmon in their outmigration, and that flow schedules during wetter years include an attraction pulse flow to provide improved habitat conditions and encourage spawning salmon to move up-river.

The amended Article 58 required the Districts to develop a program to monitor Chinook salmon populations and habitat in the Tuolumne River.[20] Article 58 also provided procedures for review of the April 1, 2005 report:

> The Licensees shall include in the results of fishery studies to be filed with the Commission by April 1, 2005, all results and a discussion of the results of all monitoring studies related to the effects of flow release fluctuations on the salmon resources in the lower Tuolumne River. The filing shall also identify all non-flow mitigative measures implemented to date, and the results of all monitoring studies related to the non-flow mitigative measures. Based on the information provided in the Licensees' study results to be filed by April 1, 2005, the Commission will determine whether to require further monitoring studies and changes in project structures and operations to protect fishery resources in the Tuolumne River, after notice and opportunity for hearing.[21]

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[18] *See Turlock Irrigation District and Modesto Irrigation District*, 76 FERC ¶ 61,117 (July 31, 1996) (1996 Order).

[19] *See* 1996 Order, at Order (D).

[20] *Id.* at Order (F).

[21] *Id.* at Order (G).

On March 24, 2005, the Districts filed the Report required by Article 58, detailing the results of the fishery and monitoring studies (2005 Report).[22] In response to this filing, on June 24, 2005, the Commission issued, "Notice of Filing of Fisheries Studies Report and Study Proposals, and Soliciting Comments, Motions to Intervene, and Protests."[23] The Resource Agencies and Conservation Groups intervened in the 2005 Report proceeding and filed comments on the report. On July 25, 2006, the Commission convened a public meeting to discuss the 2005 Report. We herein incorporate by reference the description of such meeting and subsequent comments submitted by the parties as stated in the Commission's Order on Ten-Year Summary Report under Article 58 (Ten-Year Order).[24]

D. In 1998, after the Settlement Agreement and conforming amendments, NMFS listed the Central Valley Steelhead ESU as threatened under the Endangered Species Act.

In 1998, the National Marine Fisheries Service (NMFS) listed the California Central Valley (CV) Evolutionarily Significant Unit of steelhead (*O. mykiss*) as threatened under the Endangered Species Act (ESA). The listing included the lower Tuolumne River as part of the threatened fish's geographic range.[25] NMFS has issued protective regulations under section 4(d) of the ESA, which prohibit "take" of steelhead included in this ESU without authorization.[26] Subsequently NMFS issued critical habitat designations for CV steelhead which included the Tuolumne River downstream of La Grange Dam.[27]

Because the 1964 License and subsequent amendments, including the amended Article 37 flows, could not have contemplated the steelhead listing, in 2003 NMFS petitioned the Commission to initiate formal consultation under the ESA on the Project, and to reopen the license to modify the Article 37 MFS in order to protect both steelhead and Chinook salmon in

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[22] *See* e-Library No. 20050324-5063.

[23] *See* e-Library No. 20050624-3034.

[24] *See* 123 FERC ¶ 62.012 at 64,026 (April 3, 2008).

[25] 63 Fed. Reg. 13,347, 13353 (Mar. 19, 1998).

[26] 65 Fed. Reg. 42475 (July 10, 2000).

[27] *See* 70 Fed. Reg. 52488 (Sept. 2, 2005).

the Tuolumne River.[28] The Districts agreed to be the non-federal representatives in such consultation.[29] The Conservation Groups filed a brief supporting the petition for consultation.[30] The Commission stayed action on the petition at the request of NMFS and other interested stakeholders while issues related to listing determinations were being resolved in the courts.

On January 5, 2006, following successful defense against legal challenges to NMFS' listing determination, NMFS issued its final rule, reaffirming that CV steelhead are threatened under the ESA and that NMFS had appropriately designated critical habitat.[31] According to the listing determination, NMFS cited as factors contributing to CV steelhead decline and their subsequent ESA-listing: "…the loss of most historical spawning and rearing habitat above impassable dams throughout the California Central Valley, the restriction of natural production areas, the apparent continuing decline in *O. mykiss* abundance, and the lack of any monitoring efforts designed to assess *O. mykiss* abundance and trends remain major concerns for this ESU."[32]

By letter dated June 20, 2006, NMFS filed comments with the Commission on steelhead in the Tuolumne River. It renewed its request that the Commission engage in formal consultation, eliminating any need for further delay in proceeding on NMFS' 2003 Petition for consultation under the ESA.[33] NMFS continued to urge the Commission to enter into formal ESA consultation, in comments and requests filed in 2007 and 2008.

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[28] *See* e-Library No. 20030512-5144.

[29] *See* letter from Walter P. Ward and Robert M. Nees to George H. Taylor (Mar. 31, 2003), e-library No. 20030624-0322.

[30] *See* e-Library No. 20030606-5044.

[31] 71 Fed. Reg. 834 (Jan. 5, 2006).

[32] *See* 69 Fed. Reg. 33102, 33163 (June 14, 2004).

[33] *See* NMFS, "Comments and Recommendations on Ten-Year Summary Report; Proceeding on Petition to Re-Open License," e-Library No.20060724-5041.

E. From 2005-2008, the Districts developed additional fisheries study plans to address previous study deficiencies and lack of information identified by FERC from the previous ten years of study.

On December 20, 2006, after reviewing the past ten years of study and deciding that it lacked information sufficient to inform flow schedule decisions and other mitigation of Project effects, the Commission issued a letter directing the Districts to prepare a new fisheries study plan to address the needs identified during the review process.[34] The letter stated:

> Our general conclusion about the 10-Year Summary Report, as presented at the meeting, is that for most of the required monitoring, the data were insufficient to reach any valid conclusions about the effects of the modified streamflow releases and restoration efforts on the fisheries resources of the Tuolumne River. Some of the monitoring efforts were improperly designed or executed and could not, therefore, produce data that would allow valid conclusions. Some of the mitigative measures simply have not had sufficient time for the monitoring efforts to show any change, or the response was not great enough to detect.
>
> Therefore, we conclude that under Article 58 of the license, further monitoring studies are needed. **Additional, well-designed and well-executed studies are necessary** before the effectiveness of the revised flow schedule and the non-flow mitigative measures can be determined.

The Commission directed the Districts to develop a study plan and schedule for the additional monitoring.[35]

On February 2, 2007, the Districts distributed their draft fisheries study plan to the TAC members and NMFS. On March 5, 2007, the agencies provided their respective comments on the draft plan. We herein incorporate by reference those comments and the Commission's summary of such comments as stated in the Ten-Year Order.[36] On March 20, 2007, the Districts

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[34] *See* e-Library No. 20061226-0019 (emphasis added).

[35] *Id.* at 3–4.

[36] *See* 123 FERC ¶ 62.012 at 64,027 (April 3, 2008).

filed the fisheries study plan with the Commission. Comments responding to the study plan were filed by DFG on May 23, 2007 [37] and by Conservation Groups on June 15, 2007.[38]

On June 15, 2007, the Commission issued its staff's preliminary analysis of the Tuolumne Fisheries Study Plan and comments received thereon.[39] According to Staff:

> For the most part, the plan submitted by the Districts addresses the issues we presented. **With the exception of the instream flow issue,** the Districts' plan with some fine tuning should address most of Staff concerns with the results presented in the 10-year summary report. In some cases the plan does not include details of individual studies that are crucial to evaluating their likely success.… These details should be worked out through the TRTAC.[40]

With regard to instream flow, Staff concluded:

> We conclude that the Districts continue monitoring smolt production and adult escapement to further develop the relationship between production and flow.…**Staff believes the Districts should develop a study that tests moderately high flow conditions** (>4,000 cfs average Modesto flow during April-May) at least once during the next four years to produce smolt production data for high flow conditions.…[41]

With regard to *O. mykiss*, Staff concluded:

> Except for not including in their analysis a consideration of data from nearby rivers, the Districts' plan addresses most of the items we identified to begin a meaningful analysis of the status of *O. mykiss* in the system. If these studies document the presence of a steelhead trout population in the Tuolumne River, **further analysis should be defined to determine what protective measures (e.g., flows, temperature, habitat, passage, etc.) are needed….**[42]

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[37] *See* e-Library No. 20070604-0088.

[38] *See* e-Library No. 20070615-5059.

[39] *See* e-Library No. 20070619-0175.

[40] *Id*. at 8 (emphasis added).

[41] *Id*. at 2 (emphasis added).

[42] *Id*. at 6 (emphasis added).

NMFS,[43] FWS,[44] DFG,[45] and the Conservation Groups[46] filed comments on the Staff's preliminary analysis. On July 16, 2007, the Districts filed a revised fisheries study plan,[47] and subsequently NMFS[48] and DFG[49] filed further comments. On August 8, 2007, the Commission convened a second public meeting to discuss the fisheries study plan.

The Commission issued the "Order on Ten Year Summary Report" on April 3, 2008,[50] in which the Director of the Commission's Office of Energy Projects concluded that the information presented in the 2005 Report did not warrant a change to the existing Article 37 flow requirements.[51]

On or before May 5, 2008, NMFS, FWS, DFG and the Conservation Groups filed separate requests for rehearing of the Ten-Year Order. [52]

F. The Commission's July 2009 Order on Rehearing created a non-adversarial, fact-finding proceeding to develop information on which to base interim solutions to the threats posed to fish resources.

On July 16, 2009, the Commission issued the Order on Rehearing. The Order directed neither action nor ESA consultation; instead, the Commission again found that it needed more information before it could consider altering flows in the lower Tuolumne. The Order on Rehearing directed the appointment of an Administrative Law Judge (ALJ) to conduct a non-adversarial fact-finding proceeding:

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[43] *See* e-Library No. 20070809-0151.

[44] *See* e-Library No. 20070803-0078.

[45] *See* e-Library No. 20070801-5035.

[46] *See* e-Library No. 20070716-5028.

[47] *See* e-Library No. 20070718-0082.

[48] *See* e-Library No. 20070918-5065.

[49] *See* e-Library No. 20071017-0070.

[50] *See* 123 FERC ¶ 62.012 (April 3, 2008)

[51] *Id.* at 64,033.

[52] *See* e-Library Nos. 20080505-5007, 20080507-0168, 20080502-5043, 20080506-5000, respectively.

> We direct the Chief Administrative Law Judge or his designee to appoint an administrative law judge to conduct and facilitate an expedited, non-adversarial fact finding proceeding on possible interim measures to benefit Central Valley steelhead and fall-run Chinook salmon pending relicensing, in order to develop a more complete factual record and to assist the parties in evaluating possible interim solutions. **The scope of the proceeding will be limited to an assessment of the conditions in the Tuolumne River downstream of the Don Pedro Project that may affect these fish, and any interim protective measures, including minimum flows that may be needed to improve conditions for the fishery resources.** In particular, the judge should assist the parties in developing a factual record that considers: (1) the effects of operation of the Don Pedro Project on the fishery resources for the near term pending relicensing; (2) the views of the parties regarding proposals for interim protective measures and any reasonable alternatives that may be considered necessary or desirable to address those effects, including possible changes in project facilities or operation; (3) information on the cost of implementing those measures, including capital cost and value of foregone generation; (4) the effects of implementing the measures on other, non-fishery resources, such as irrigation, municipal water supply, and flood control; and (5) whether there is any basis for agreement among the parties on possible solutions to the issue of interim protective measures for fishery resources. [53]

The Order on Rehearing required the Presiding Judge to file a final report and provided additional instructions regarding hearing procedures:

> [W]e direct the presiding judge to file a report of the results of this proceeding within 120 days from the date of this order. Parties may offer written comments or conclusions that will be appended to the report. The report will not be an initial decision, so we will not entertain the filings of briefs on or opposing exceptions. Further, we do not anticipate the need for cross-examination of witnesses. The judge need not create an exhaustive record, but may work with the parties to create a record that provides a thorough picture of the facts, problems, and possible solutions. After reviewing the report and the parties' comments, we will reconsider the need for interim protective measures pending relicensing, in light of the information developed in this proceeding on interim conditions. We will also consider whether further procedures, such as preparation of an

[53] Order on Rehearing at 61,157, ¶ 99 (emphasis added).

environmental assessment or initiation of ESA consultation, may be needed before any proposed interim measures can be implemented.[54]

On October 6-7, 2009, the Judge conducted a two-day hearing in Sacramento, California, and six weeks later issued a "Final Report of the Presiding Judge on Interim Measures" (Final Report).[55]

Pursuant to the Order on Rehearing and the ALJ's Order Clarifying Procedures, the Resource Agencies and Conservation Groups submit the following comments on the Final Report to assist the Commission in making its determination regarding the need for interim protective measures for the fall-run Chinook salmon and Central Valley steelhead in the Tuolumne River.

III.
REGULATORY AND LEGAL CONTEXT

The Commission's decisions must comply with federal environmental protection statutes and regulations. In particular, the Commission must take the following authorities into consideration as it deliberates upon the interim protective measures necessary to protect the salmonid species of the Tuolumne River.

A. Endangered Species Act

The Endangered Species Act of 1973 (ESA) protects plants and animals listed by the federal government as "endangered" or "threatened." As correctly recognized by the Commission in its July 16, 2009 Order, the lower Tuolumne River is occupied by anadromous steelhead (*O. mykiss*) - a threatened species under the federal ESA. NMFS has designated Critical Habitat for anadromous steelhead in the lower Tuolumne River downstream of La Grange Dam.

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[54] *Id.* at ¶ 102.

[55] 129 FERC ¶ 63,015 (November 20, 2009) (Final Report).

1. The Commission's actions must avoid jeopardy to anadromous steelhead.

The ESA requires FERC, as a federal agency, to conserve endangered and threatened species and insure that the Commission's actions do not jeopardize the continued existence of such species or result in the destruction or adverse modification of the critical habitats of these species.

Mandating affirmative conservation action, section 7(a)(1) of the ESA states:

> All Federal agencies shall, in consultation with and with the assistance of the Secretary [of Commerce and/or Interior], utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act.[56]

Protecting against adverse consequences, section 7(a)(2) of the ESA states:

> Each Federal Agency shall, in consultation with and with the assistance of the Secretary [of Commerce and/or Interior], insure that any action authorized, funded, or carried out by such agency…is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary to be critical. [57]

Although recognizing the authority of section 7(a)(2), the Commission previously delayed consultation with NMFS on the effects of the Project on steelhead. In its 2003 order postponing consideration of NMFS' petition for consultation, the Commission suggested that an appropriate time to consult on the effects of the amendment to steelhead would be when it exercises its reserved authority to consider a license amendment.[58] In the subsequent July 2009 Order on Rehearing, the Commission asserted that it had taken no action, and therefore had no reason nor obligation to consult,[59] regardless of any harm done by the Project to listed steelhead.

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[56] 16 U.S.C. § 1536(a)(1).

[57] 16 U.S.C. § 1536(a)(2).

[58] 105 FERC ¶ 61,332, at ¶ 7.

[59] Order on Rehearing at 61,145.

The Resource Agencies and Conservation Groups urge the Commission to carefully consider consultation at this juncture. In 1996, the Commission amended Article 58 of the License to implement a monitoring program, and reserved authority to determine whether further studies and changes in project structures and operations to protect fishery resources would be ordered.[60] The Commission established a new proceeding upon the Districts' filing of the Fisheries Study Report required under Article 58.[61] In line with the Commission's Notice of Filing of Fisheries Studies Report and Study Proposals, and Soliciting Comments, Motions to Intervene, and Protests" under this subdocket,[62] multiple parties have intervened in this proceeding, and NMFS, FWS, DFG and the Conservation Groups filed separate requests for rehearing of the Ten-Year Order. [63] Having now assigned an Administrative Law Judge to take evidence under a hearing-like process, accepted hundreds of exhibits including written testimony, and provided a forum for two days of oral testimony, the Commission is faced with the prospect of using this information to decide the future of the hydropower operations in the Tuolumne River. By doing so, the Commission will make a choice which will determine the fate of ESA-listed fish, pending relicensing. The Commission will be taking action when it adopts, rejects, or orders a combination of measures based on the facts brought forward in the hearing. That action requires consultation under the ESA.

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[60] 76 FERC ¶ 61,117 (1996) at ¶ G.

[61] The Commission in its July 2009 Order on Rehearing acknowledged that this established a new and separate proceeding, requiring new motions to intervene by entities that had been parties to the earlier licensing and amendment proceedings. 128 FERC at 61,142, n. 17. Further, only those entities that intervened in the new proceeding on the Ten-Year Report were accorded party status and allowed to participate in the expedited fact-finding process. *Id.* at 61,157, ¶ 99.

[62] *See* e-Library No. 20050624-3034.

[63] *See* e-Library Nos. 20080505-5007, 20080507-0168, 20080502-5043, 20080506-5000, respectively.

2. Regardless of whether the Commission acknowledges its responsibility to consult, take of protected species subjects the licensees to prosecution and litigation.

The ESA prohibits the unauthorized "take"[64] of ESA-listed species.[65] NMFS' regulations addressing harm in the definition of "take" in the ESA state that harm "means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering."[66] In *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995), the Supreme Court upheld the FWS' similar regulatory definition of harm by concluding that "based on the text, structure, and legislative history of the ESA, . . . the Secretary reasonably construed the intent of Congress when he defined 'harm' to include 'significant habitat modification or degradation that actually kills or injures wildlife.'" [67]

NMFS regulations promulgated under section 4(d) of the ESA (16 U.S.C. § 1533(d)) prohibit unauthorized take of steelhead within the geographic extents of the Central Valley steelhead ESU, including the lower Tuolumne River.[68] Because there has never been a consultation on the Project, licensees are operating without benefit of an incidental take statement or other authorization which would protect them from liability for take of steelhead. As demonstrated below, NMFS has made every effort to caution licensees that take of listed steelhead is likely occurring through project operations. Harm to listed steelhead, including degradation of their habitat that results in injury, is unequivocally prohibited, and is subject to both enforcement action by NMFS and citizen suits by the Conservation Groups.

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[64] "Take" is defined in the ESA to mean to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19).

[65] 16 U.S.C. § 1538.

[66] *See* 50 C.F.R. § 222.102.

[67] 515 U.S. at 708.

[68] *See* 50 C.F.R. § 223.203.

B. Magnuson-Stevens Fisheries Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA)[69] requires the Commission, as a Federal action agency, to consult with NMFS on all actions that may adversely affect Essential Fish Habitat (EFH).[70] In the lower Tuolumne River, EFH is designated for Chinook salmon downstream of La Grange Dam. Therefore, an EFH consultation is required.

EFH is defined in the MSA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."[71] The components of this definition are interpreted at 50 C.F.R. §600.10 as follows:

> "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

C. Federal Power Act

Section 4(e) of the Federal Power Act requires the Commission in licensing proceedings to give "equal consideration" to "…the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat)."[72] Section 10(a)(1) of the FPA requires that:

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[69] 16 U.S.C § 1801 *et seq*.

[70] Section 305(b)(2) of the MSA states "Each Federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act." 16 U.S.C. § 1855(b)(2).

[71] 16 U.S.C. § 1802(10).

[72] 16 U.S.C. § 797(e).

> the project adopted…shall be such as in the judgment of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes referred to in section 4(e).[73]

Section 10(j) requires that each license include conditions for the protection, mitigation, and enhancement of fish and wildlife resources impacted by the development, operation and management of the Project and that the Commission shall accord "…due weight to the recommendations, expertise, and statutory responsibilities…" of the resource agencies in resolving inconsistencies. [74]

D. Central Valley Project Improvement Act

Recovery of anadromous fish populations to viable population levels is recognized as a priority under federal and state law and guidance.[75] For instance, Section 3406(b)(1) of the Central Valley Project Improvement Act[76] directs the Secretary of the Interior to include fish and wildlife protection, restoration, mitigation and enhancement as project purposes of the Central Valley Project, having equal priority with irrigation and domestic use and power generation. The Anadromous Fish Restoration Program resulted from the CVPIA, and seeks to at least double natural production of anadromous fish in California's Central Valley streams.[77] Evidence shows that the remaining habitat accessible to anadromous fishes in the lower Tuolumne River[78] is currently used by several freshwater life-cycle stages of steelhead and salmon. Recovery of

[73] 16 U.S.C. § 803(a)(1).

[74] 16 U.S.C. § 803(j).

[75] Reynolds et. al. (CDFG 1990).

[76] 106 Stat. 4706, 4714 (1992).

[77] Exhibit No. FWS-2, Direct Written Testimony of Michelle Workman, at 3.

[78] In this document, the lower Tuolumne River refers to the segment from the San Joaquin River confluence to the current limit of upstream fish migration (the La Grange and New Don Pedro Dams).

populations within this historic and currently usable habitat in the Tuolumne River is thus an important goal. Interim measures that benefit these anadromous populations are a necessary step in reaching that goal.

E. Fish and Wildlife Coordination Act

For any Federal or Federally-authorized project which proposes to control, modify, or develop the Nation's waters, the Fish and Wildlife Coordination Act requires that fish and wildlife be given equal consideration with other project purposes, and is coordinated with other aspects of water resources development. [79] The FWCA establishes a consultation requirement for Federal agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage.[80] Federal law requires the Commission to give fish and wildlife equal consideration with other project purposes.

IV.
GENERAL COMMENTS REGARDING OVERALL TREATMENT OF HEARING RECORD

The long and contentious history related to fish issues and this Project is outlined in the Background Section. In its Order on Rehearing, the Commission considered that the history and evidence before it merited a further inquiry into the need for interim protective measures pending relicensing, due to the presence of ESA-listed steelhead and the serious decline of fall-run Chinook salmon in the Tuolumne River.[81] The common thread joining the initial licensing of this Project in 1964 with the expedited fact-finding process of 2009 has been the significant impacts of the Don Pedro Project on the fishery resources of the Tuolumne River. While the

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[79] 16 U.S.C. § 661 *et. seq*.

[80] 16 U.S.C. § 662(a).

[81] The Commission specifically made this fact-finding inquiry relevant only to the "need for interim protective measures pending relicensing." Accordingly, the record before the Commission resulting from the fact-finding process relates only to the narrow purpose of exploring whether interim protective measures are necessary prior to relicensing, and was not intended nor designed to establish a precedent for the upcoming relicensing. As the Commission noted, "at relicensing, the Commission will have an opportunity to consider anew how best to balance the competing interests involved for the term of any new license that it may issue." Order on Rehearing at 61,155, ¶ 88. .

forthcoming relicensing process for this Project will allow the Commission and Parties to further explore Project effects and competing interests, the focus now is on whether interim protective measures are necessary prior to 2016 to protect two species: one that is listed under the ESA (steelhead) and one that has been recognized by the Commission to be in serious decline (Chinook salmon). The Resource Agencies and Conservation Groups provide the following comments on the Record compiled in the fact-finding proceeding, and the Report, to aid the Commission in its determination regarding interim protective measures.

A. The Final Report adopts certain disputed evidence without explanation.

The Commission should not adopt the Report's Findings 270-291 as the sole basis of an Order determining interim measures because the Findings lack proper support. An order adopting the ultimate Findings in the Final Report could not be shown to be anything other than arbitrary and capricious, and certainly could not be based on facts deemed conclusive, because it cannot be shown whether the parties' conflicting evidence was adequately considered.

Under Section 313(b) of the FPA, were an order based on the Findings to be subject to judicial review, the underlying facts could be considered conclusive only if they were supported by substantial evidence.[82] "Substantial evidence" is such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.[83] There is no evidence in the record as to potential effects to the Districts and City resulting from the Resource Agencies' recommended Interim Measures during almost all water year scenarios other than a continued drought. Without any such evidence, a court could not find that substantial evidence exists, and the Commission would not enjoy the protection of having its findings deemed conclusive on judicial review.

In this proceeding, the Districts' and the City's testimony focused on potential harms to them caused during drought scenarios, which the uncontradicted testimony of NMFS hydrologist

[82] 16 U.S.C. § 825*l* (b).

[83] *Eichler v. SEC*, 757 F.2d 1066, 1069 (9th Cir. 1985).

Craig Anderson showed were highly unlikely.[84] For the majority of potential water years, no evidence was presented demonstrating potential harm resulting from implementation of the proposed Interim Measures. A reasonable mind could find no facts on which to base opposition to the granting of the Interim Measures for an overwhelming majority of the potential water years. The Commission should undertake an independent review of the testimony and evidence included in the record of this proceeding in order to make a determination that is supported by substantial evidence.

The Administrative Procedure Act (APA) provides uniform standards for proceedings conducted by federal agencies and for judicial review of final agency decisions. As discussed in this section and Section V, *infra*, the Report does not include specific findings of fact and law in support of its ultimate findings. The record will be incomplete without such findings, and so we request that the Commission make such findings in the course of making a final decision in this proceeding. Under APA section 706(2)(A),[85] a court will "hold unlawful and set aside agency action, findings, and conclusions found to be -- (A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;… (D) without observance of procedure required by law; (E) unsupported by substantial evidence in a case subject to sections 556 and 557 of this title or otherwise reviewed on the record of an agency hearing provided by statute…." While the scope of judicial review is "narrow and a court is not to substitute its judgment for that of the agency," the agency "…must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choices made.'"[86] While a court will "uphold a decision of less than ideal clarity if the agency's path may

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[84] Exhibit No. NMF-52: Rebuttal Testimony of Craig Anderson, NMFS, to District's Exhibit No. DIS-1, Direct Testimony of F. Wesley Monier, at p. 2. Mr. Anderson's testimony stated: "The probability of incurring two consecutive critical water years (2010 and 2011) is 8.4%. When applying a five-year moving window to the period of record (i.e., 2007-2011, with 2007 and 2008 classified as critical and 2009 classified as dry), the probability of incurring four critical and one dry water year is still less than 1%."

[85] 5 U.S.C. §706(2)(A).

[86] *Motor Vehicle Manufacturers Association of the United States v. State Farm Mutual Insurance*, 463 U.S. 29, 43 (1983), citing *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962).

reasonably be discerned," it may not "supply a reasoned basis for the agency's action that the agency itself has not given."[87]

The Commission is, of course, entitled to substitute its own judgment for that reflected in the Final Report. In these Comments, the Resource Agencies and Conservation Groups seek to focus the Commission's attention on the evidence supporting the need for fish flows, the absence of evidence showing concomitant harm to other parties in the vast majority of water year scenarios, and the need to consider that imbalance in crafting an Order for interim measures.

The Final Report provides no explanation as to why adopted disputed evidence was more probative than conflicting evidence. Since the findings do not include explanation or articulate a logic path between evidence considered and conclusion reached, it cannot be determined whether the Judge considered the evidence supplied in opposition to an adopted point. The omission of explanation exposes the Commission to the risk of taking an arbitrary and capricious action should it adopt the Report's ultimate findings without taking its own hard look at the evidence in the Administrative Record.

The bulk of the Final Report is a summary restatement of witness testimonies and certain other evidence on the hearing topics.[88] This summary restatement confirms that conflicting evidence exists on each topic. These condensed simplifications of the actual testimonies cannot reliably substitute for the totality of the information presented before the Commission.

Paragraphs 270-291 constitute the Final Report's Findings. Each Finding cites to supporting evidence. None of the Findings explain how the Judge determined that the evidence cited in support of a particular Finding is the most reliable for that Finding, nor do they provide the basis for disregarding conflicting evidence in reaching the particular Finding. A reasoned decision must explain the basis for the decision and the rationale for determining that certain evidence is more probative than other evidence. This lack of explanation is inconsistent with reasoned decision-making.

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[87] *Id.* (citations omitted).

[88] *See* Final Report at ¶¶ 1-269.

This fact-finding proceeding involved the presentation of testimony from twenty-five witnesses, all of whom were qualified as experts in their fields. The Resource Agencies and Conservation Groups presented nine witnesses with considerable scientific expertise and practical experience; however, it appears that none of the Agency witness testimony was given any deference with respect to disputed matters. We find the lack of explanation especially problematic given the Report's strong preference for the District's and CCSF's evidence, in areas where Courts have consistently recognized the wisdom of deferring to the Resource Agencies' expertise in matters affecting their own trust resources. Furthermore, Resource Agency scientists, who provided testimony, have exclusive expertise in the population dynamics of "small" anadromous salmonid populations (such as CV steelhead and CV fall-run Chinook salmon) and NMFS scientists have exclusive expertise in managing and assessing the needs of ESA-listed anadromous fish species within the legal requirements of the Endangered Species Act.

As a representative example of the Report's unexplained decision making, in Finding 171 it adopted a conclusion that "the Tuolumne River Chinook may be subject to extirpation, but is not at risk of extinction pending relicensing…" and that escapement levels in the Tuolumne River and other tributaries, are likely to rebound…" In reaching this conclusion, the Final Report favored the testimony of the Districts' witness Noah Hume over Agency witness Dr. Carl Mesick, whose extinction risk analysis is part of the FERC Record. Further, the Report simply overlooked the corroborating written and oral testimony of NMFS scientist Dr. Steven Lindley who wrote the following (in part) as a rebuttal to Hume's unproven conjectures:

> First, the extinction risk criteria of Lindley *et. al.* (2007) were applied appropriately by Carl Mesick and Mesick's conclusion is correct as described in greater detail in my direct testimony on this matter (NMF-4). In order for a salmon population to be considered viable, it should be able to avoid triggering the criteria during prolonged periods of unfavorable environmental conditions, be they in the ocean, estuary, or freshwater. An incorrect application would be to conclude that the Tuolumne River fall-run Chinook population would be at low risk with an assessment applied after a period of unusually favorable environmental conditions.

> Second, extinction is a stochastic process.[89] The fact that a population has not yet gone extinct (and in this case, Hume (DIS-15, page 15, line 12) suggests that the local population may have been extirpated and re-colonized by migrants from other populations within the ESU), is not evidence that it won't go extinct sometime soon. In fact, conservation biologists have the concept of "extinction debt"-- populations or species that are doomed to extinction due to demographic, genetic or habitat conditions, but have not yet gone extinct. To minimize the risk of extinction, it is best to manage the population such that it avoids periods of enhanced vulnerability, such as the periodic crashes exhibited by Tuolumne River fall-run Chinook.
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> Third, ocean conditions have improved recently, and this should benefit fall-run Chinook salmon populations. However, freshwater conditions have deteriorated due to low river flow conditions during this drought period. The overall abundance of fall-run Chinook salmon may increase above recent record low levels, because perhaps most fall-run Chinook salmon recruits are produced in hatcheries and released in the Bay, avoiding the deleterious effects of the drought in freshwater rearing streams. Naturally-produced populations may or may not increase, depending on the balance of improving ocean conditions and declining freshwater and estuarine conditions.

This is but one example of a striking pattern that emerges from a close reading of the Report. Although the Agencies and Conservation Groups have endeavored to document some additional examples in a later section of this document (*See*, Section V. Responses to Specific Findings, *infra*), the instances are ubiquitous and cannot be fully itemized in the time frame allotted for this response to the Commission. In its decision on interim measures, the Commission must explain the specific evidentiary basis—along with an analysis for assigning

[89] In a stochastic or random process there is some indeterminacy in its future evolution described by probability distributions. This means that even if the initial condition (or starting point) is known, there are many possibilities by which the process might progress, but some paths may be more probable and others less.

weight to particular evidence—for all findings, including its resolution of any conflicting evidence.

B. The Districts and CCSF based key testimony on an improbable scenario, and the Report adopts it without explanation.

The Report does not recommend that the Commission order the release of additional instream flows as included in the Agencies' Interim Flow Measures. The Report states that: "Implementation of the Interim Flow Proposal would result in a significant increase in the cost of energy if the hydrology of water years 1987 and 1988 is repeated over the next two water years (October 1, 2009 through September 30, 2011), and the Districts are required to release additional instream flows to meet the terms of the Interim Flow Proposal. Energy reliability would also be impacted."[90] The assumption that the next several years will be drought years is based exclusively on unsupported supposition by the Districts' and CCSF's witnesses.

The Districts and CCSF testimony predicted dire effects to municipal and agricultural water supply if the recommended interim measure flows were to be implemented. These cost estimates were opinions of the witnesses of the Districts and CCSF, reflecting their respective vested interests. But their reasoning that linked the potential costs of interim measures to a worst-case hydrologic forecast was grossly deficient in several important aspects. First, the reservoir dynamics associated with flows required for implementation of interim measures are not yet accurately quantified. Second, there was no consideration given to the fact that the actual 2009-2010 Don Pedro reservoir carryover storage volume is more than 1.4 million acre-feet going into the next water year, meaning that an ample carryover storage volume exists to ease any uncertainties about hydrologic forecasting. Third, evidence demonstrated how the entire economic impact analysis of both the Districts and CCSF rested on the unsubstantiated assumption that the next several years will also be consecutive drought years, in addition to the three previous years which were recorded as dry/critically-dry years.

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[90] Final Report at ¶ 286 (citing ¶¶ 62-66).

The Resource Agencies offered testimony that it is very unlikely that the next several years will be consecutive drought years. According to the rebuttal testimony of NMFS' hydrologist Craig Anderson:

> In his direct testimony, F. Wesley Monier provides an analysis to determine the impacts of the USFWS' and NMFS' May 2, 2008 flow proposals on the Districts' water supply. In describing the assumptions of that analysis, Mr. Monier states that the 1987-1992 drought was not the most severe drought of record (see Monier direct testimony page 3, line 12). Mr. Monier contradicts himself by defining the "drought of record" as "the longest consecutive number of dry water years on the Tuolumne River since record keeping began over 100 years ago" (page 3, line 1). Based on this definition, there can only be one "drought of record", and the 1987-1992 dry period is that drought. Monier's testimony also suffers ambiguity and subjectivity in framing the subsequent analysis because there are no definitions of the terms "severe" or "drought".
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> According to the California Department of Water Resources published unimpaired runoff records utilized in determining the San Joaquin Valley Hydrologic Index, there is no other period since 1901 that has had six consecutive critical water year types. The 1929-1934 drought referred to in Mr. Monier's testimony consisted of three consecutive critical water years, followed by an above normal and a dry year, and concluded with a critical year in water year 1934. From 1901-2008, there were only three other periods with consecutive critical water year types: (1) water years 1960-1961, (2) water years 1976-1977, and (3) water years 2007-2008. It is important to emphasize that all three of these dry periods, characterized by critical water year type classifications, only lasted 2 years. Based on the 1901-2008 period of record, the probability that any one water year will be classified as critical is 17.6% as compared to: dry (13.9%), below normal (15.7%), above normal (19.4%), and wet (33.3%). More importantly, when applying a six-year moving window (i.e., 1901-1906, 1902-1907, …, 2003-2008) to the period of record, the probability of incurring six consecutive critical water year types is less than 1%. Additionally, Mr. Monier's water supply impact analysis indicated that the active storage of New Don Pedro Reservoir would be drained by the end of water year 2011. **The probability of incurring two consecutive critical water years (2010 and 2011) is 8.4%. When applying a five-year moving window to the period of record (i.e., 2007-2011, with 2007 and 2008 classified as critical and 2009 classified as dry), the probability of incurring four critical and one dry water year is still less than 1%.**

> While water years 1976-1977 did have the lowest two-year water yield on record in the San Joaquin Valley, characterizing that period as the most severe drought is subjective and does not appropriately compare a timeframe equivalent to that of the 1987-1992 "drought of record". The 1987-1992 period has the lowest total unimpaired flow volume (16.4 million acre-feet) for any six-year period in the 1901-2008 period of record, with a range of 16.4 million acre-feet for the 1987-1992 period to 54.7 million acre-feet for the 1978-1983 period. Similarly, the 1987-1992 period has the lowest average San Joaquin Valley Water Year Index (1.7), with a range of 1.7 for the 1987-1992 period to 4.9 for the 1906-1911 period.
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> Given the information provided above, I conclude that the section of Mr. Monier's testimony characterizing drought severity in the San Joaquin Valley, including the Tuolumne River, is both unclear and subjective and does not accurately portray the severity of the 1987-1992 drought. While other periods (i.e., 1976-1977) may have had lower annual unimpaired flow volumes, the 1987-1992 drought had both the most consecutive years classified as critical water year types and the lowest total unimpaired flow volumes for any six-year timeframe during the period of record. This distinction is important because Mr. Monier based his water impact analysis for water years 2010-2015 on the assumption that the hydrology of the 1987-1992 drought would be repeated for that six-year period. As the record shows, the probability of incurring another drought with that magnitude and duration is very low. Additionally, considering that water years 2007-2009 consisted of two critical years and a dry year (verging on critical), a continuance of six additional critical years would result in a nine-year period with eight critical years and one dry year, a hydrological trend unprecedented in the period of record. [91]

Mr. Anderson's written rebuttal testimony was uncontested. At the hearing, Mr. Anderson explained and amplified his testimony, while the Districts' and CCSF's witnesses could not offer an explanation as to the reasonableness of using their worst-case scenario as a premise for their opinions about the costs of interim measures. For example, when asked by the Judge for his opinion on the likelihood of the Tuolumne River experiencing six more consecutive critical water years, Districts' witness Mr. Monier testified that "[t]here's no way to predict or

[91] Exhibit No. NMF-52, Rebuttal Testimony of Craig Anderson, NMFS, to District's Exhibit No. DIS-1, Direct Testimony of F. Wesley Monier (emphasis added).

forecast what's going to happen in the future." [92] He also indicated that he could not predict what would happen within two years.[93] He further indicated he was not aware of any period in recorded history that consisted of eight critical and one dry water year.[94]

Without explanation, the Report seems to have disregarded Mr. Monier's important admissions, which undercut the value of the Districts' economic and social impacts testimony. In responding to Commission's request for information about the costs of interim measures on non-fishery resources, the Report adopted only the Licensees' worst-case weather forecast scenario. Significant to the Commission's further deliberation, virtually all of the economic and social cost prognostications proffered by the Licensee Parties are based on a forecast which the Districts conceded, under examination, that they could not support.

Under FPA section 10(a)(1), the Commission must evaluate a range of reasonable hydrologic scenarios; it cannot make a finding that an action is best adapted to a comprehensive plan of development based solely on a worst case hydrologic scenario. In order for the Commission to make a reasoned decision, it must evaluate the potential impacts of increased interim flows under a range of hydrologic scenarios. This is what it customarily does prior to making decisions regarding instream flows. We recommend that Commission Staff consult with the California State Water Resources Control Board and California Department of Water Resources, which both have expertise regarding drought forecasting and water supply planning, in the course of making its final decision in this proceeding.

The Licensee Parties' extended drought scenario, while acceptable for development as a contingency or emergency operations plan, is not a justifiable scenario to describe the entire realm of hydrologic possibilities as they relate to the Agencies' proposed Interim Measures. The Report does nothing to close the gap in the record as to impacts of the proposed Interim Measures during hydrologic scenarios that should occur 92 to 99 per cent of the time.[95] Because

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[92] Hearing Transcript at 80:11–12.

[93] Hearing Transcript at 81:3–4.

[94] *Id. at* 10–14.

[95] Depending on whether a two or five year scenario is being examined. Craig Anderson's rebuttal testimony(Exhibit NMF-52) to F. Wesley Monier's hydrology forecast in Exhibit DIS-1 stated that the probability of a five-year

the findings do not recognize, let alone evaluate, the much more probable hydrologic scenarios that are likely to occur, the Report's findings in this key area are not supported by substantial evidence.

A more reasoned approach would have recognized that 50% of the time, supplementation of Article 37 flows could be provided for important benefits to anadromous fish without risking significant cutbacks in the water supply for other beneficial uses. It would also have identified the gap in the hydrologic recurrence interval between the Districts' and the City's worst-case scenario and the 50% of the time when supplemental fish flows would not cause other cutbacks. At a minimum, this is where meaningful improvement to the salmonid habitat could be afforded at a reasonable cost. A more complete analysis would also acknowledge the Agencies' proposal for an emergency conferencing procedure, moderated by FERC, to determine an acceptable water rationing and allocation plan under drought conditions, should such conditions actually occur.

C. The record is incomplete with regard to the economic and social value related to the loss of the fishery.

The Order on Rehearing instructed the ALJ to assist the parties in developing a factual record that considered, among other issues, "information on the cost of implementing [any interim] measures, including capital cost and value of foregone generation," and "the effects of implementing the measures on other, non-fishery resources, such as irrigation, municipal water supply, and flood control." [96] It did not provide for developing the factual record with regard to the costs associated with ongoing impairment of the fisheries, including economic losses from closure of the salmon fishery and maintenance of the steelhead fishery as a federally threatened species. Due to the expedited nature of the proceeding, the Resource Agencies and Conservation Groups focused their testimonies on the central theme provided in the July 19,

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sequence that included four Critically Dry years and one Dry year is less than 1%. In oral testimony, Monier focused on a two year scenario of Critically Dry years, stating that it would dry up Don Pedro Reservoir. (See Transcript 80:9 and following lines). The probability of two consecutive Critically Dry years, as demonstrated by Mr. Anderson in NMF-52, is 8.4%.

[96] Order on Rehearing. 128 FERC at p. 61,157, ¶102

2009 FERC Order on re-hearing: "…the scope of the proceeding will be limited to an assessment of the conditions in the Tuolumne River downstream of the Don Pedro Project that may affect these fish, and any interim protective measures, including minimum flows, that may be needed to improve conditions for the fishery resources." [97]

The Report contains predicted cost implications of recommended interim measures, but it does not include any evidence regarding the economic and social impacts associated with the extirpation of salmon and steelhead from the Tuolumne River. In balancing fishery and non-fishery values, the Commission must supplement the Record to account equally for costs of the anadromous fishery decline in what was historically one of the Central Valley's key anadromous fish-producing streams - the Tuolumne River. The decline of Central Valley anadromous fish stocks has reached a crisis point. Recent escapements of Central Valley fall-run Chinook salmon have been historically low and prompted the complete closure of the west coast fishery. Hundreds of millions of dollars have been lost to the sport and commercial fishing industries over the past several years due to diminishing catches and fishery closures. Additional hundreds of millions of dollars are lost by businesses related to the fishing industry when salmon are in low abundance, e.g., fishing gear sales, restaurants, coastal jobs supporting fishing activities, etc. In addition, Native American tribes are deprived of an important subsistence food and cultural resource. The current shutdown of the salmon fishery is costing California an estimated $1.4 billion in lost economic activity and 23,000 jobs in both the commercial and recreational saltwater fishing sectors.[98]

California's Central Valley was historically the second largest salmon-producing river system in the lower 48 states, second only to the Columbia River.[99] The Tuolumne River was once a major contributor to the Central Valley salmon stocks. In the pre-dam era, the Tuolumne

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[97] *Id.* However, we believe that should the Commission choose not to provide the relief sought for fisheries, the Commission must quantify and address the economic and social value related to ongoing impairment or extirpation of the fisheries in order to have a complete record as basis for its final decision in this proceeding.

[98] Southwick Associates, Calculation of the Project Economic and Jobs Impact of Salmon Recovery in California, 06/24/09 (Southwick Associates), attached hereto as Appendix D and available at http://www.asafishing.org/newsroom/documents/salmon_recovery_economics.pdf (last accessed 01/05/10).

[99] *Id.*

River supported tens of thousands of adult salmon on average each year; but now its contribution is reduced to nearly nothing. Large hydropower installations—such as the Don Pedro Project—have long been identified as primary causative factors in the decline and continued suppression of west coast salmon stocks. FERC's own scientific analysis [100] shows this to be true, pointing specifically toward the Don Pedro Project and eight other large FERC-licensed projects in California's Central Valley.

D. The record is incomplete with regard to the costs of ongoing maintenance of ESA-listed species.

The Commission must acknowledge and supplement the Record with an analysis of the cost of maintenance of ESA-listed species. Among the several protected and highly managed fish species native to the Central Valley, there are four anadromous fish species currently listed under the federal Endangered Species Act. One of these ESA-listed species, Central Valley steelhead (*O. mykiss),* is currently documented to inhabit the lower Tuolumne River. Other Tuolumne River anadromous fish are either fully extirpated (spring-run Chinook), or at the brink of extirpation (fall/late fall Chinook) due primarily to the Don Pedro hydropower project's dramatic alteration of the Tuolumne River's salmonid habitats. Further downstream of the Tuolumne River, Chinook salmon, steelhead, and other species of concern exist in the San Joaquin River and the Bay-Delta where ample Tuolumne River flows contributed to the robust health of a prolific ecosystem in the pre-dam era. This is no longer the case. In the post-dam era, stream flows in the Central Valley's rivers and streams have been severely altered or curtailed, often by more than 50 per cent of unimpaired flows, leaving only a fraction of the natural flow to sustain the fish and wildlife that evolved to depend on the magnitude and timing of nature's hydrologic cycle.

The Commission has yet to quantify the societal costs of neglecting the fresh water needs of fish and wildlife in the Central Valley watersheds and in the San Francisco Bay-Delta estuary. Yet the Commission's powers and duties include mandating license conditions for several of the

[100] NMF-28, Sale et al. "Potential Cumulative Effects of Hydropower projects in the Bay-Delta, California." Oak Ridge National Laboratory for FERC Division of Project Compliance and Administration, October 1995.

giant California hydropower operations which bear much of the responsibility for the fisheries crisis.

Full recovery of California's Central Valley Chinook salmon runs could provide $5.7 billion in new economic activity for the state and create 94,000 new jobs.[101] FERC should consider these externalized costs to the environment when it balances the costs of hydropower operations and its impacts to the environment. The regulatory and legal activities concomitant with a continued failure to restore the ecosystem to a healthy condition amount to billions of dollars per year that could be redirected toward other societal needs.

E. The Commission-defined scope of the hearing was the Tuolumne River, but the report focused on factors beyond the Tuolumne River.

The Order on Rehearing specified that the "scope of the [expedited fact-finding] proceeding will be limited to an assessment of the conditions in the Tuolumne River downstream of the Don Pedro Project that may affect these fish, and any interim protective measures, including minimum flows, that may be needed to improve conditions for the fishery resources."[102] The Presiding Judge was charged with working "with the parties to create a record that provides a thorough picture of the facts, problems, and possible solutions."[103] Thus, the scope of the hearing was to be about Project impacts on fish and habitat in the lower Tuolumne River and measures that could be implemented to mitigate those impacts.

Despite these directions, a significant portion of the testimony and evidence presented by the Districts and CCSF inappropriately concerned impacts beyond the Tuolumne River and the effects to the species caused by factors other than those within the Project's direct sphere of influence. Much of the Districts and CCSF testimony was not on point according to the instructions of the Commission. Report Finding 277[104] furthers this misdirection, by making Findings concerning factors outside the Tuolumne River that may affect survival of *O. mykiss*

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[101] Southwick Associates, *infra*, at p. 3..

[102] Order on Rehearing at 61,157, ¶99.

[103] *Id* at. ¶ 102a.

[104] Final Report at ¶ 277.

and Chinook salmon, concluding that "[i]t would not be possible for flow levels to overcome all of these and other out-of-river factors before relicensing."[105] This is clearly beyond the scope of the proceeding and thus should not be considered by the Commission in making its determination on interim protective measures.

We acknowledge that there may be other limiting factors affecting fish once they leave the Tuolumne River, but the existence of other limiting factors does not obviate the Commission's duty to mitigate project impacts on the Tuolumne River. The purpose of this limited proceeding was to determine whether the Project was impairing fisheries in the lower Tuolumne, and if so, to determine whether there were actions that could be taken by the licensees to mitigate those impacts. The Resource Agencies provided evidence that shows that Project operations are impairing fisheries and there are interim measures that could be implemented by the Districts that would help improve the fishery regardless of other limiting factors farther downstream. Given that the Resource Agencies and Conservation Groups have answered the threshold issues for this proceeding in the positive (the project is impairing fisheries and there are measures that could be implemented immediately that would improve the condition of the fisheries prior to relicensing), we believe it is incumbent on the Commission to proceed to environmental analysis to determine the potential impacts of the interim measures and any other reasonable alternatives to other beneficial uses of the river.

[105] Additional discussion of how Finding 277 exceeds the FERC-defined scope of the proceeding is presented in the Section V below.

V.
RESPONSES TO SPECIFIC FINDINGS

In this section, the Agencies and Conservation Groups present comments to the Commission regarding the specific findings in the ALJ Final Report.

A. Findings relating to hydrology, habitat conditions and fisheries

Finding 270. The Project impedes Tuolumne River flows released from upstream reservoirs, and upstream tributary flows. The operation of the Project not only reduces instream flows, but also changes the times of year when flows peak. Article 37 minimum flows are below actual Tuolumne flows at La Grange, thereby generally limiting flow availability. The change in the times of the year that flow levels peak – a result of the Article 37 minimum flow regime – are also a concern because the fish have different flow needs depending on the times of their various life stages. The life stages of the salmon and steelhead do not always coincide.

Comment:

Finding 270 concludes that the Project impedes Tuolumne River flows, reduces instream flows, and changes the times of year when flows peak - which are a concern because salmon and steelhead have different flow needs depending on the presence of their various life stages, which do not always coincide. Use of the term "impede" to characterize the Project's effects on flows in the lower Tuolumne River highly generalizes and understates these alterations. Impede means to "obstruct", "hinder", "delay", "slow down", etc. However, the post-Project hydrologic alterations result in much more than the impediment of flows recognized in Finding 270, which fails to discuss or analyze the large-scale *diversion and export* of flows from the watershed, made possible by the Project and interrelated facilities. Paragraph 1 of the Report describes the hydrological linkage of the CCSF's series of dams, reservoirs, diversions, and conveyance facilities upstream of the Project as "helping to regulate inflows to Don Pedro"; in this case, major diversions and exports of water from the Tuolumne watershed are characterized as beneficial Project-related actions, which downplays their potential cumulative adverse environmental effects on the lower Tuolumne.

In reaching its Finding 270 conclusion, the Report references paragraphs 138, 178 and 198-203; these references summarize testimonies of Ms. Boucher of the Friends of the Tuolumne,[106] Mr. Heyne of DFG,[107] and Ms. Workman of FWS.[108] The Report is seriously deficient in citing only to testimony by biologists (Heyne and Workman) and witness Boucher, while omitting reference to, or analysis of, the testimony of Mr. Anderson, a NMFS hydrologist.[109] The extensive written testimony of Mr. Anderson discussed the hydrology of the Tuolumne River basin, graphically depicted the alterations of stream flow characteristics due to Project and interrelated facilities, and established the links between seasonal alterations in the Tuolumne and the various freshwater life stages of CV Chinook salmon and steelhead affected by them.[110] The Anderson testimony was presented in response to issues outlined by the ALJ in the Order on Scope of Proceedings and Setting Due Dates (Issued August 13, 2009): 1) the effects of the operations of the Don Pedro Project on the fishery resources for the near term pending relicensing; and (2) the views of the parties regarding proposals for interim protective measures and any reasonable alternatives that may be considered necessary or desirable to address those effects, including possible changes in Project facilities or operations.

Mr. Anderson's testimony referenced and relied heavily upon the thorough hydrologic evaluations of McBain and Trush,[111] which were based on a long historic record of Tuolumne River flow data. Rather than rely on Finding 270, which is not reflective of the full breadth of testimony and other evidence contained in the record of this proceeding, the Commission should more carefully consider the Anderson testimony and its supporting information.[112] This information collectively suggests that post-Project hydrologic conditions in the lower Tuolumne are greatly altered, and some seasonal flow components are virtually lost in some water years under Article 37 requirements (See Figures 5, 6, and 7 from Anderson's testimony, NMF-4 below). The Commission should contrast this view of hydrologic alteration with that in Finding

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[106] Final Report at ¶ 138.

[107] *Id.* at ¶ 178.

[108] *Id.* at ¶¶ 198-203.

[109] *Id.* at ¶ 39.

[110] Exhibit No. NMF-4.

[111] Exhibit No. NMF-37.

[112] Including Exhibit No. NMF-37.

270, which only acknowledges Project effects upon flow magnitude and timing (when peaks occur). The Commission should review the available testimony and supporting information to fully evaluate the post-Project alterations of flow magnitude (amount), timing (when an event occurs), frequency (how often an event occurs), duration (how long an event persists), and rate-of-change (how quickly flows rise or fall) in the lower Tuolumne River; all of these flow components, and the post-Project component alterations—by season—are discussed in Mr. Anderson's testimony and in supporting information. Graphs provided from the Anderson testimony are provided in the Figures below.[113]

[113] Exhibit No. NMF-4.

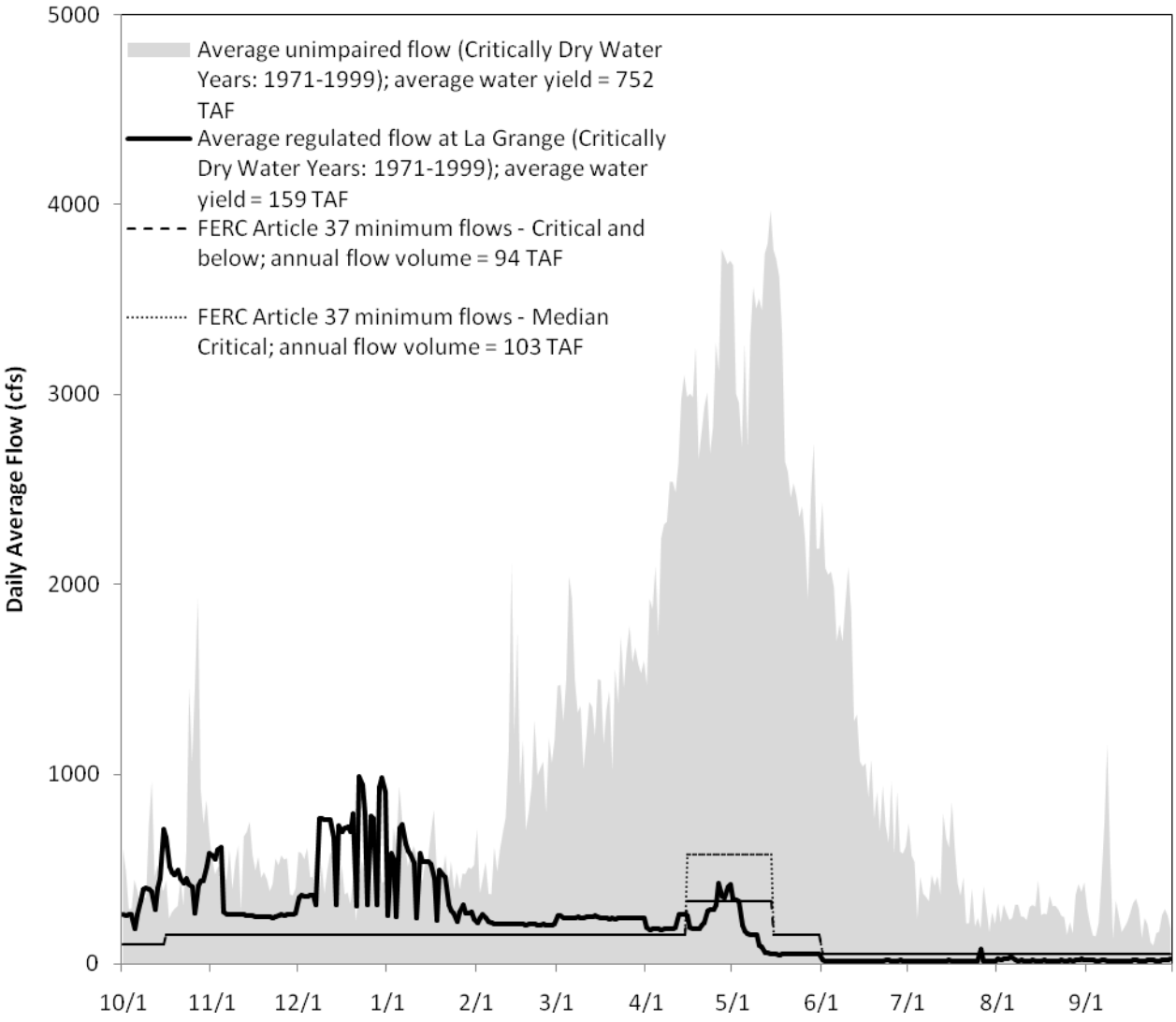

Exhibit NMF-4: Figure 5. Average unimpaired and regulated flow at La Grange for "Critically Dry" water year types (1971-1999) and FERC Article 37 minimum flow schedules for "Critical and Below" and "Median Critical" water year types.

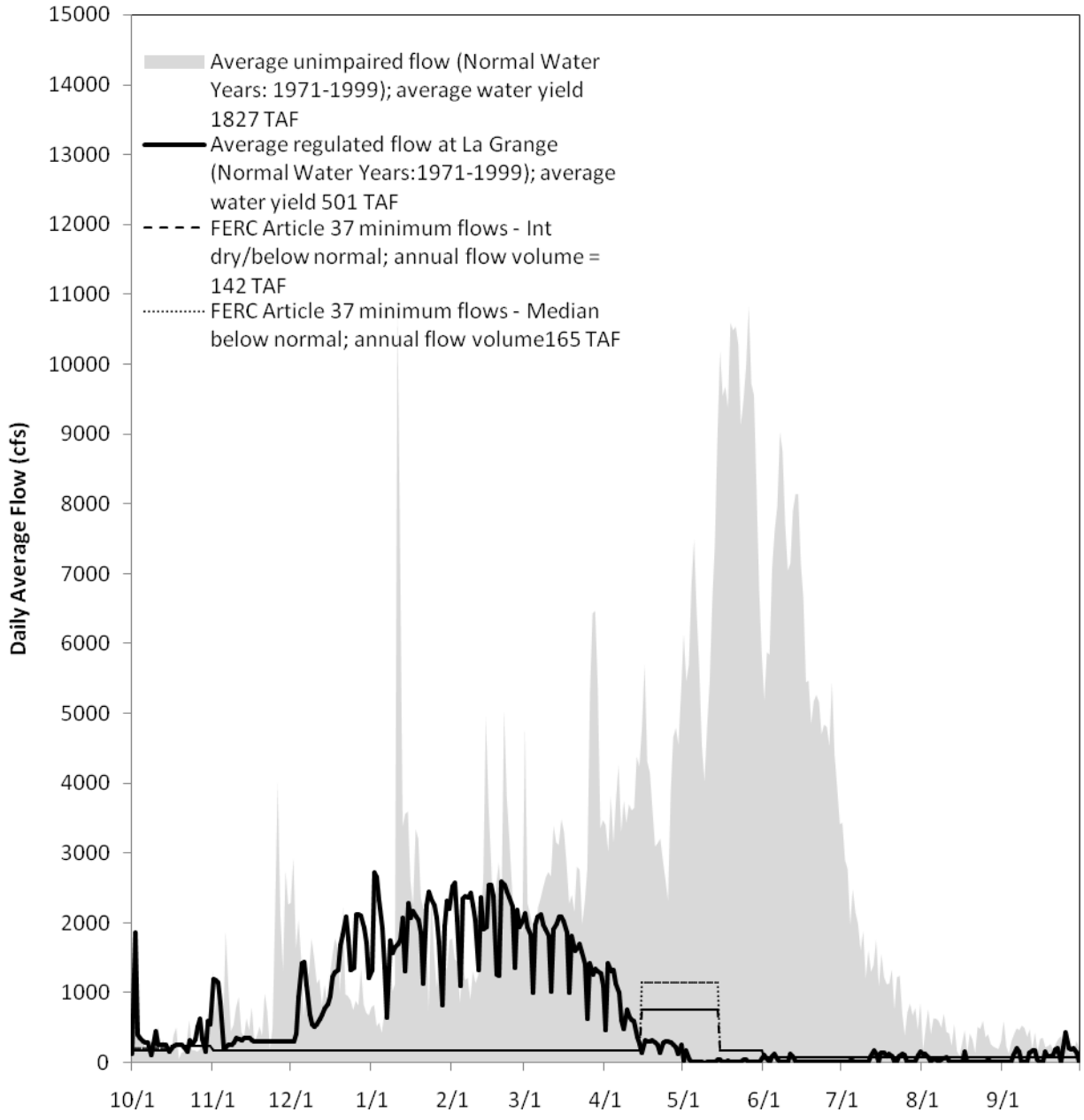

Exhibit NMF-4: Figure 6. Average unimpaired and regulated flow at La Grange for "Normal" water year types (1971-1999) and FERC Article 37 minimum flow schedules for "Intermediate Dry/Below Normal" and "Median Below Normal" water year types.

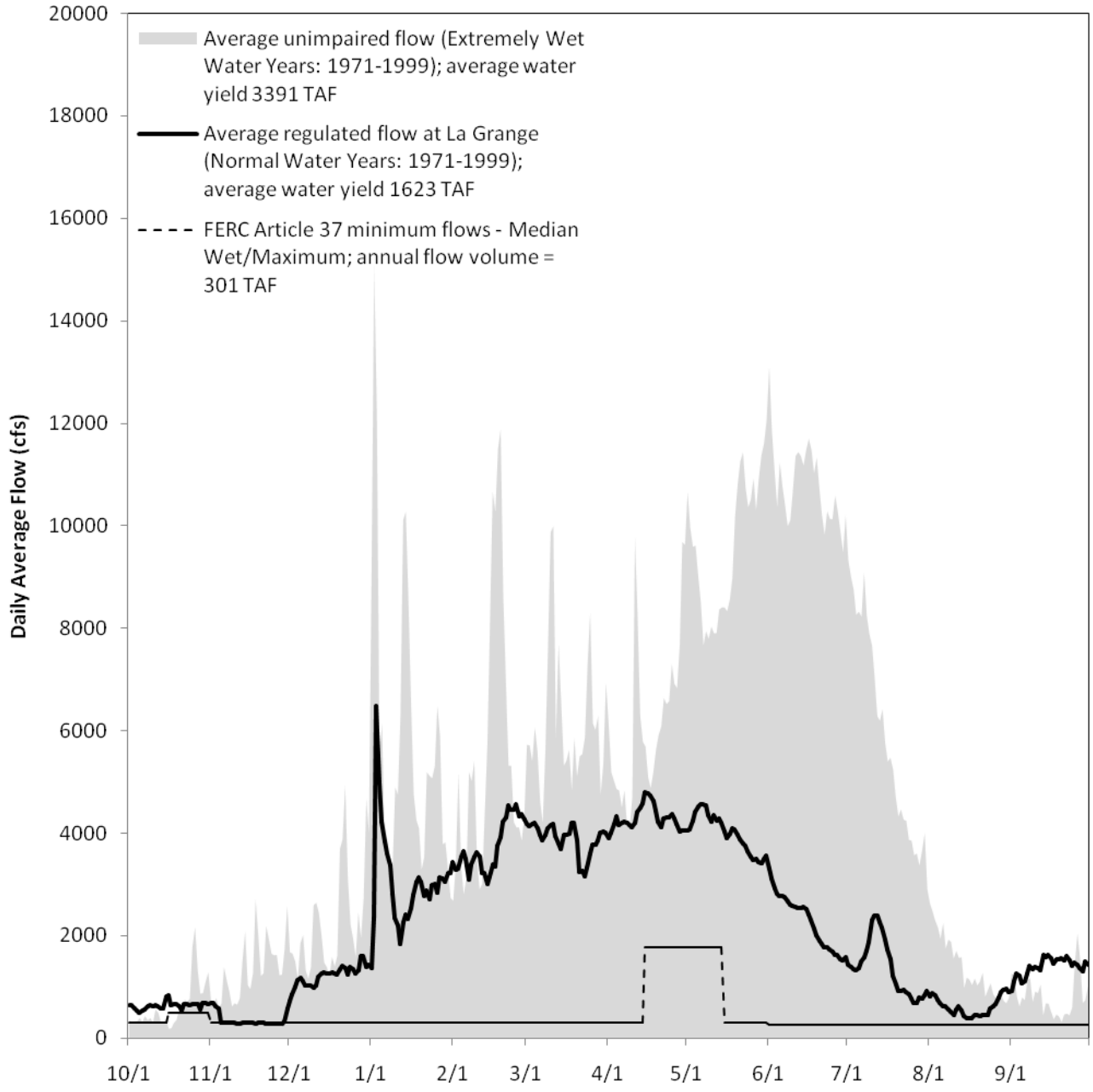

Exhibit NMF-4: Figure 7. Average unimpaired and regulated flow at La Grange for "Extremely Wet" water year types (1971-1999) and FERC Article 37 minimum flow schedule for "Median Wet/ Maximum" water year types.

Finding 270 is correct that fish have different flow needs depending on the times their various life stages exist in freshwater; for example, Chinook adult immigration (late

summer/early fall); Chinook spawning (fall/late fall); incubation (late fall/early winter); fry survival (winter/early spring); smoltification and outmigration (spring); *O. mykiss* juvenile rearing (summer). These needs are directly reflected in the Agencies' proposed Interim Measures,[114] which are organized by season expressly to benefit the salmonid life stages present in the Tuolumne each season, and to prevent the localized extinction of anadromous salmonids in the River. Article 37 flows are not so devised, and are thus deficient.

To consider more fully the seasonal hydrologic alterations due to the Project, the Commission should review and consider the testimony of Dr. Gard regarding the effects of Article 37 flows (even with added flood control releases) on floodplain inundation;[115] this testimony explains how post-Project flows are inadequate in normal or dry years to inundate Tuolumne River floodplains for the benefit of juvenile salmonids. The Commission should also consider the testimony of Dr. Gordus regarding the effects of Article 37 flows on lower Tuolumne stream temperatures;[116] this testimony demonstrates that post-Project flows result in stream temperatures that do not satisfy the seasonal thermal requirements for CV fall-run Chinook or CV steelhead populations, in some years negatively affecting multiple life stages of these fishes over several miles of habitat during long intervals. Mr. Heyne provided testimony and supporting information detailing more than three decades of scientific analyses of the impacts of post-Project springtime flows on the critical juvenile salmon life-stages.[117] In Finding 270, the Report inadequately summarized this substantial body of research in two paragraphs,[118] and oversimplified these findings as supporting the conclusion that seasonal manipulation of flows by the Project are a "concern" for fish. Clearly, Mr. Heyne's testimony goes beyond expressing concern, and the Commission in its determination should regard more attentively his evidence regarding Project impacts on out-migrating juvenile salmonids. In its forthcoming determination, the Commission should examine all the evidence in the record to

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[114] Exhibit Nos. NMF-1, FWS-1, DFG-1.

[115] Exhibit Nos. FWS-6 at 3-6; FWS-106.

[116] Exhibit No. DFG-4.

[117] Exhibit Nos. DFG-2 at 8-14; 6; 10; 12; 14; 20; 23.

[118] Final Report at ¶¶ 178-179.

determine the hydrologic effects of the Project, and how those effects are having negative impacts on the Tuolumne River fishery.

Finding 270 is correct that the life stages (e.g., adult, egg, juvenile, etc.) of Chinook salmon and steelhead do not spatially and temporally overlap completely. Agency testimony emphasized that a critical difference between the species is that juvenile Central Valley steelhead commonly hold over through the summer before migrating to the ocean, whereas fall-run Chinook salmon seldom do.[119] Agency testimony identified the necessity of modification of Article 37 flows to meet the habitat requirements of over-summering steelhead,[120] especially their unmet thermal requirements.[121] Testimony on this point explained that temperatures in the Tuolumne downstream of LaGrange Dam are flow dependent, and Article 37 flows are presently deficient for supporting anything but a depressed population restricted in summer to a small area downstream of the Dam.[122] Interim Measures were proposed to alleviate habitat restrictions, with adaptive management offered as the alternative to prolonged study in advance of remedial actions (a management path that has not been productive at the Project over decades).[123]

Finding 271. Primary consideration was given to the needs of fall-run Chinook salmon in development of Article 37 flow schedules. Needs of O. mykiss populations were given some consideration, however. Anadromous and resident O. mykiss share a co-dependant life history. Presently, the anadromous form is rare in the Tuolumne River.

Comment:

Finding 271 is flawed because it dismisses Agency concerns about Project effect on *O. mykiss* based on the view of one District witness that the Article 37 flow schedule took into account the needs of *O. mykiss* and upon the mistaken view that the needs of both species are the same. The Commission should note that the original Article 37 flow schedule in the 1964

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[119] Exhibit Nos. FWS-2; NMF-2.

[120] Exhibit Nos. NMF-2 at 13; NMF-6; NMF-49A at 1-3; FWS-2 at 16; FWS-97A at 2; DFG-4.

[121] Exhibit No. DFG-4.

[122] *Id.*

[123] Exhibit Nos. NMF-1, FWS-1, DFG-1.

license was intended to limit the over-summering of *O. mykiss* juveniles, as stated in the Direct testimony of Mr. Wilcox as follows:

> I note in this regard that, because O. mykiss may prey upon juvenile Chinook salmon, **the original Article 37 flow schedule** recommended by CDFG and subsequently adopted by the Commission in the 1964 license **was intended to limit over-summering of O. mykiss juveniles.** Before the current flow regime was implemented in 1996, there were very few O. mykiss identified in historical fisheries surveys of the lower Tuolumne River during summer, and non below River Mile ("RM") 48. See Exhibits DIS-31 and DIS 32.[124]

The 1996 amendment to Article 37 required a revised minimum flow regime designed to benefit fisheries resources in the Tuolumne.[125] However, the Commission should fully evaluate the testimony and evidence in this proceeding indicating that amended Article 37 flows do not satisfy the population **threshold** requirements in order to "benefit" the fishery. Agency testimony (e.g., Gordus,[126] Mesick,[127] Strange,[128] Workman[129]) provided evidence that stream temperatures resulting from flows under Article 37 do not adequately satisfy the thermal thresholds for *O. mykiss* or steelhead populations. Further, Agency testimony emphasized that acute, mortality-based temperature criteria for steelhead are not correct to apply,[130] but rather chronic criteria must be used that support sufficient reproductive success and recruitment to the population. The testimony of Strange pointed out that actions should aim to improve the Tuolumne steelhead population from its current depressed or impaired status, to assist in the recovery of the CV steelhead ESU.[131]

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[124] Exhibit No. DIS-28, Direct Testimony of Scott Wilcox (emphasis added),

[125] Final Report at ¶ 4.

[126] Exhibit No. DFG-4 at 3-12.

[127] Exhibit No. FWS-4 at 9-10, 12-14

[128] Exhibit No. NMF-48 at 3-4.

[129] Exhibit No. FWS-97A at 2.

[130] Exhibit Nos. DFG-4; 27; 28; 29; FWS-95A.

[131] Exhibit No. NMF-2 at 18.

The assertion in Finding 271 that *O. mykiss* populations were given "some consideration" in Article 37 flow schedules also does not recognize that at the time both the original Article 37 flows were implemented (1971) and amended (1996), steelhead were not acknowledged by FERC as present in the Tuolumne River. In the Order on the Summary Report (April 3, 2008), Commission staff found that no *O. mykiss* anadromy had been identified.[132] In 2009, the Commission recognized that steelhead are present in the Tuolumne River.[133] Accordingly, the needs of CV steelhead were not adequately considered in the development of Article 37 flows, but must be considered now in the consideration of the need for interim protective measures.

Finding 271 is correct that the anadromous form of *O. mykiss* presently appears to be rare in the Tuolumne River;[134] however, the Commission should recognize that the total *O. mykiss* population size (resident plus anadromous forms) remains severely depressed in the lower Tuolumne. Supporting evidence includes fish surveys,[135] comparison of Tuolumne *O. mykiss* abundances with those in other Sierra Nevadan rivers,[136] and Agency testimony.[137] Zimmerman et al. (2009) (NMF-32) found a low proportion of *O. mykiss* sampled from the lower Tuolumne River exhibited anadromy or were the progeny of CV steelhead. The Commission should recognize that even if the anadromous-to-resident proportion remains unchanged (and low) in the Tuolumne, a higher total *O. mykiss* population size would result in improved steelhead numbers.

Improved conditions that result in a higher total *O. mykiss* population could increase the existing anadromous-to-resident ratio because: a) higher densities increase competition for limited resources, and favor migratory behavior;[138] and b) dams (and Project-related operations) influence the expression of steelhead life history diversity, and operation strategies that more closely recreate historical hydrologic and geomorphic processes favor this diversity. This would

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[132] Order on Rehearing at 61,149, ¶ 56.

[133] *Id.* at 61,150, ¶61.

[134] Exhibit No. NMF-32, Zimmerman et al. 2009.

[135] Exhibit Nos. NMF-38, 41, 54.

[136] Exhibit No. NMF-55.

[137] Exhibit Nos. NMF-48, 51.

[138] Tr. at 328, Lindley oral testimony.

include anadromy among *O. mykiss*.[139] For these reasons, Agency Interim Measures are intended to adjust Project operations in an adaptive way, to encourage an increase in the total *O. mykiss* numbers as well as raising the proportion of those individuals exhibiting anadromous (steelhead) behavior.[140]

The Commission should consider testimony that summer flows may be a limiting factor holding the Tuolumne *O. mykiss* populations at low levels,[141] as well as otolith study results from the nearby Calaveras and Stanislaus rivers (which have higher and colder summer flows than the Tuolumne), and have much greater percentages of steelhead in their total *O. mykiss* populations.[142]

Finding 271 concludes that anadromous and resident *O. mykiss* share a co-dependent life history. The Commission should request clarification of this statement, as its meaning is unclear. It is correct that *O. mykiss* exhibiting residency may smolt and become steelhead, and that *O. mykiss* that are the progeny of steelhead may exhibit residency.

Finding 272. The various life stages of O. mykiss and Chinook salmon require cooler water temperatures. Increased flows from La Grange decrease water temperature in the Tuolumne River, but it is not known what amount of flow will sufficiently reduce water temperatures.

Comment:

Finding 272 constitutes the Report's sole finding relating to water temperature and its effects on *O. mykiss* and Chinook salmon. Finding 272 concludes "salmon require cooler water" but the amount of flow necessary to benefit fish is "not known." The Report does not adequately represent the factual record of the evidence presented regarding the Project's impacts on downstream water temperatures.

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[139] Exhibit No. NMF-6 at 5, Lindley testimony.

[140] Exhibit Nos. DFG-1, FWS-1, NMF-1.

[141] Exhibit Nos. NMF-2, NMF-6, FWS-2, DFG-4.

[142] Exhibit No. NMF-32, Zimmerman et al. (2009); Tr. at 294, Mesick oral testimony.

O. mykiss and Chinook salmon are cold water species, and their various life stages require cold, not cooler water temperatures.[143] Dr. Gordus provided testimony and supporting information detailing the relationship between flow releases from the Project and subsequent impairment of downstream water temperatures.[144] While the Report includes seven paragraphs summarizing Dr. Gordus' empirical and modeled data (paragraphs 165-171), only one Finding (No. 272), evaluates this extensive dataset.

Increased flows downstream of La Grange Dam would decrease water temperatures in the lower Tuolumne River through late spring, summer, and early fall seasons, and would expand the distance (and area) downstream that the improved river temperatures would persist. Prolonged high spring flows would provide water temperatures necessary for Chinook salmon and steelhead smoltification. The Tuolumne River historically had a protracted high spring flow period under which the fall and spring-run Chinook and steelhead evolved.[145] Dr. Gordus' direct testimony and supporting temperature monitoring data indicated that water temperatures in the lower Tuolumne River during the Chinook salmon smolt migration period (March 15 – June 15) were impaired 11 out of 14 weeks.[146] This evaluation was based on the Chinook salmon smolt criteria of less than 15 C. Steelhead smolts require even colder temperatures for smoltification, less than 14 C. This emphasizes the fact that high spring flows with subsequent cold water temperatures may be even more crucial to supporting smoltification of juvenile *O. mykiss*, thus increasing the anadromous (steelhead) component of the Tuolumne River population. The testimony of Gordus provides evidence that demonstrate that increased spring flows are strongly associated with reduced water temperatures, and that as spring flows increase, water temperatures substantially decrease.[147]

Dr. Lindley's testimony states that summer low flows and high temperatures are what most restrict the distribution of steelhead in the Central Valley.[148] The testimony of Dr. Gordus

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[143] Exhibit No. DFG-4 at 4-6, 10, 13, Gordus testimony.

[144] Exhibit Nos. DFG-4, 7, 8, 9, 19, 21, 24.

[145] Exhibit No. NMF-6, Anderson.

[146] Exhibit No. DFG-4; Exhibit No. DFG-7.

[147] Exhibit No. DFG-4 at Figures 1, 2.

[148] Exhibit No. NMF-6, Lindley Direct at 3; 15-22.

and several years of temperature monitoring data corroborate Dr. Lindley's views;[149] nine years of temperature data demonstrate that maximum mean temperatures in the lower Tuolumne were above the threshold (18°C) for summer rearing of CV steelhead the **entire season** (June 15 - September 15) for three of the nine years.[150] During years of impairment, the area of river where thermal exceedences occurred for summer rearing *O. mykiss* ranged from one to eight miles (10% to 80%) of the Tuolumne River's length.[151] The Commission should review Exhibit DFG-19, Figure 4, which provides a visual summary of the percent habitat impaired areas within the first 10 miles downstream from the La Grange Dam over the study period. Last, the testimony of Gordus explained that stream temperatures were met during wet years, and the differences of impairment across weeks between the wet years (1998, 2005, and 2006) compared to the dry years (2001, 2002, 2004) are extreme, suggesting that higher flows improved water temperatures during the summer months.[152]

Finding 272 suggests it is not known what amount of flow will sufficiently reduce water temperatures; however, as indicated by the evidence presented in this proceeding, a modeling tool exists for predicting this amount. The testimony of Dr. Gordus includes analysis of the relationship of Tuolumne River flow and temperature based on predictions of the San Joaquin River Basin HEC5Q Water Temperature Model (developed for the CalFed Ecosystem Restoration Program).[153] Finding 272 references the Report's summarized testimony of Dr. Mesick (P 192) in support of its conclusion, but the summary did not recognize that the direct testimony of Dr. Mesick discusses the HEC5Q model and its predictions of temperatures in the Tuolumne River.[154] In addition, Finding 272 does not consider Dr. Mesick's oral testimony predicting the amounts of flow that the Agencies' Interim Measures would require in dry and critical water years; existing water temperature models were used in the predictions.[155]

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[149] Exhibit No. DFG-4; Exhibit No. DFG-7.

[150] Exhibit No. DFG-7, Table 4.

[151] *Id.*

[152] Exhibit No. DFG-4 at 11.

[153] Exhibit No. DFG-4 at 9, Figure 1.

[154] Exhibit No. FWS-4 at. 14.

[155] Tr. at 295:7-296:24, Mesick Oral Testimony.

The Commission should note the several locations in the Report where temperature models used to predict flow versus temperature relationships in the Tuolumne are mentioned and discussed. In paragraph 61, Mr. Monier cites a model used to predicts flows that would be required to meet the temperature components of flows proposed. In paragraph 81, Mr. Hume testified about water temperature model simulations, and how the results were used for his assessments of the ability of water supplies to meet the proposed objectives for fall migration of Chinook salmon, spring outmigration of juvenile Chinook salmon, and over-summer holding and rearing of CV steelhead. The Report's paragraph 93 summarizes how the Districts have examined the relationship between instream flow and water temperature using a SNTEMP water temperature model; it also explains that the influence of flows on water temperature has since been modeled using the updated HEC-5Q water temperature model. Paragraph 93 also explains that temperatures have been monitored **directly** over a range of flow and meteorological conditions (presumably with the abundant instream thermometers that have been placed in the Tuolumne for several years). The existence of abundant direct measurements of river temperatures under various flow and meteorological conditions, along with more than one existing predictive model, does not support the conclusion in Finding 272 that it is not known what amount of flow will sufficiently reduce water temperatures.

The Agency Interim Measures regarding temperatures propose monitoring that uses a **refined** temperature model to predict release flow targets to meet the requirement;[156] to clarify, this refinement was intended to refer efforts necessary (if any) to adequately calibrate the HEC5Q model for use at appropriate spatial scales in the Tuolumne (there are abundant *in situ* temperature logging devices along the River to be used for additional input data). The Interim Measures were also predicated on adaptive management; if predicted flow releases were found to be insufficient to meet required temperatures (based on logging device measurements), or were greater than required to meet targets, flows could be adjusted. Interim Measures relying on adaptive management should not be delayed because a predictive flow-temperature model is not believed to be initially capable of high precision (that could over time be improved).

[156] Exhibit Nos. DFG-1, FWS-1, NMF-1 at 1-4.

Finally, the Commission should note it has recently recommended use of the San Joaquin River Basin HEC5Q Water Temperature Model to assess the flow versus temperature effects in the nearby Merced River, due to the Merced River Hydroelectric Project. Similar application in the Tuolumne would be reasonable based on the Commission's determination of its suitability for use in the Merced.

Finding 273. Article 37 flows have provided some benefit to O. mykiss and Chinook salmon by providing increased habitat, increased depth and decreased temperatures, but their numbers have not increased to pre-Project levels. Anadromous O. mykiss are rare in, and the Chinook salmon population has declined in, the lower Tuolumne.

Comment:

Finding 273 lacks detail in its assertion that Article 37 flows have provided "some benefit" to *O. mykiss* and Chinook salmon by providing increased habitat, increased depth and decreased temperatures. Finding 273 references paragraphs 49, 177-179 and 212-213 in support of its conclusions. The Commission should consider that none of the referenced paragraphs present information supporting the Finding that benefit to *O. mykiss* and Chinook salmon has been provided through increased water depths in the Tuolumne.

The 1996 amendment to Article 58 required the Districts to implement a monitoring plan to "identify benefits" to the Tuolumne's Chinook salmon fishery that could be realized from improved environmental conditions.[157] The Commission's letter on the Districts' Ten-Year Summary Report (December 20, 2006) stated that data collected pursuant to Article 58 monitoring was generally insufficient to reach valid conclusions. Notwithstanding the monitoring deficiencies under Article 58, Agency testimony demonstrates that Article 37 flows have not resulted in identifiable benefits to the Chinook salmon or steelhead fishery.

Agency testimony explained how the Chinook salmon is currently at a high risk of extinction in the Tuolumne River which does not support the Finding 273 conclusion of benefit

[157] Final Report at ¶ 4.

due to Article 37 flows.[158] Finding 273 downplays the high risk of extinction facing the Tuolumne Chinook by concluding only that the population has declined, and by failing to reference the testimonies of Dr. Mesick or Dr. Lindley on this point.[159] The CV steelhead ESU remains "threatened" with extinction.[160] Mr. Heyne's direct testimony explained that while CV steelhead still exist in the lower Tuolumne River they have reached such low numbers as to barely be detected by monitoring.[161] Additional testimony containing agency analysis of *O. mykiss* surveys suggest very low trout densities persist in the Tuolumne compared with other Sierran rivers.[162] The Commission should consider this information, which casts doubt upon the exaggerated claims of a "dramatically" improved *O. mykiss* fishery.[163] While Finding 273 references the summarized testimony of Ms. Strange in support of its conclusion of "some benefit" to *O. mykiss*,[164] the subjects of these references are floodplain inundation and migration, and do not reference or discuss the adverse effects due to elevated summer water temperatures.[165]

The Report's paragraph 92 recounts the testimony of Mr. Wilcox that *O. mykiss* life history requirements are similar to those of Chinook salmon, and as a result both benefit from the flow provisions of the 1995 Agreement. This contention omits the important over-summering requirements of steelhead, as cold summer flows are not required to sustain the fall-run Chinook salmon population, but are essential to sustain the *O. mykiss* capable of exhibiting the anadromous behavior of steelhead (Workman, Strange). The Commission should review Agency testimony explaining that "take" of CV steelhead is occurring in the lower Tuolumne River due to Project operations, primarily due to high water temperatures occurring during the summer.[166] The Commission should review the testimony of Dr. Lindley that summer low flows

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[158] Exhibit No.FWS-4; Exhibit No. NMF-6.

[159] *Id.*

[160] Exhibit No. NMF-2.

[161] Exhibit No. DFG-2 at 7.

[162] Exhibit Nos. NMF-38; NMF-48, NMF-51; NMF-54; NMF-55.

[163] Final Report at ¶ 94.

[164] *Id.* at ¶¶ 212-213.

[165] *Id.*.

[166] Exhibit No. NMF-2 at 14; Exhibit Nos. NMF-25; NMF-23; NMFS-OLE (2008).

and high temperatures are what most restrict the distribution of steelhead in the Central Valley.[167] The Commission should review the testimony of Dr. Gordus[168] and several years of temperature monitoring data[169] that corroborate Dr. Lindley's views and confirm the testimony of Ms. Strange[170] that "take" of CV steelhead is occurring due to elevated summer temperatures. The Commission should closely consider the Interim Measures[171] proposed to reduce the temporal and spatial extent of the existing temperature impairments in the Tuolumne.

Finding 274. O. mykiss can choose between outmigrating to the ocean and remaining in fresh water. The probability of survival is higher if they do not attempt to outmigrate. Although the increased summer flows required under Article 37 have resulted in higher numbers of O. mykiss overall, it is not clear that additional increases would lead to increased populations of anadromous O. mykiss in the Tuolumne. O. mykiss may be choosing to stay in the Tuolumne.

Comment:

The Finding 274 characterization of *O. mykiss* behavior contains oversimplified, anthropocentric language adopted directly from Mr. Wilcox that "[m]ost lower Tuolumne River *O. mykiss* choose to stay in freshwater because the probability of survival is higher."[172] The suggestion that young fish "choose" between residency and ocean migration is answered in Dr. Lindley's written testimony,[173] which describe anadromous versus resident behaviors in an evolutionary context. It is noteworthy that Dr. Lindley is currently employed as a Supervisory Research Ecologist at NMFS, where he conducts and supervises research on the ecology of anadromous fishes, was involved in the status assessments underlying the ESA listing of CV steelhead as a threatened species, and chaired the Technical Recovery Team for steelhead in the

[167] Exhibit No. NMF-6 at 3; 15-22.

[168] Exhibit No. DFG-4.

[169] Exhibit No. DFG-7.

[170] Exhibit No. NMF-2 at 14.

[171] Exhibit Nos. DFG-1; FWS-1; NMF-1.

[172] Final Report at ¶ 96; Exhibit No. DIS-28, at. 6-7.

[173] Exhibit No. NMF-6 at 5.

Central Valley region.[174] Accordingly, Dr. Lindley's testimony should be given considerable weight by the Commission in evaluating the population responses of CV steelhead to altered environmental conditions (such as those due to the Project), and in evaluating their likely responses to improved conditions (such those proposed in the Interim Measures).[175]

Dr. Lindley's testimony explains that anadromy should be favored when this strategy has higher expected consequences for fitness than residency, i.e., when the growth prospects offered by ocean rearing outweigh the costs of migration and attendant risk of mortality.[176] Dr. Lindley further testifies that exactly how expression of anadromy happens may depend on the evolutionary history of the population, and may change over time as populations continue to evolve in response to changed selective pressures. The Commission should consider the evolutionary context provided in this testimony because the explanations of *O. mykiss* "choice" described by Mr. Wilcox and repeated in Finding 274 speak only to the proximate (environmental) factors that could influence anadromy and do not include ultimate (fitness) considerations.

Moreover, the Commission should recognize that Finding 274 does not adequately consider the fact that Project-controlled factors influencing anadromy may be in need of modification, in order that they better promote anadromous behavior. Applying Mr. Wilcox's line of reasoning, it could be considered "risky" behavior for *O. mykiss* to choose to stay in the Tuolumne over the summer. Testimony and other filed information demonstrate project effects that include unsuitably high water temperatures,[177] the presence of predators,[178] and the lack of fish passage to the hundreds of kilometers of historic, over-summer (cold) habitats upstream.[179] Dr. Lindley notes that growth and survival prospects in the stream are determined by water temperature, food supply, the abundance of other fish in the stream, and other river conditions that are directly or indirectly influenced by dams (such as those of the Project and interrelated

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[174] Final Report at ¶ 40.

[175] Exhibit Nos. DFG-1; FWS-1; NMF-1.

[176] Exhibit No. NMF-6 at 5.

[177] Exhibit No. DFG-4, Gordus Direct.

[178] Exhibit No. NMF-54.

[179] Exhibit No. NMF-43, Lindley et al. 2006.

facilities);[180] these factors, as well as those downstream of the Tuolumne, influence the expression of steelhead life history. In oral testimony, Dr. Lindley explains that conditions in the Tuolumne River that increase competition among *O. mykiss* in the river for limited resources can favor migratory behavior in the population.[181]

The Commission should consider that the testimony of Dr. Gordus and supporting temperature monitoring data strongly suggests that thermal conditions in the lower Tuolumne are inadequate and provide too few miles of suitable *O. mykiss* habitat to sustain reproduction and recruitment success of the population across generations.[182] The Commission should more closely evaluate the assertion in Finding 274 that the increased summer flows required under Article 37 have resulted in higher numbers of *O. mykiss* overall. Higher is a relative term, and Finding 274 is unclear about how it was determined that increased summer flows under Article 37 have resulted in appreciably higher numbers of *O. mykiss*, meaningful when viewed in a population context.

The testimony of Ms. Strange answering the testimony of Mr. Ramirez and Dr. Moyle explained that *O. mykiss* snorkel census data are presented in a way that exaggerates the numbers of *O. mykiss* in the lower Tuolumne.[183] Population estimates combine adult and juvenile numbers, and closer inspection reveals that numbers of adults (so named if they exceeded 5.9 inches length) observed by snorkeling remains very low, indicating poor recruitment of age-0 fish to ages-1 and 2 (when they smolt). The numbers of *O. mykiss* are reported without "weighting" or considering the length of river surveyed. When the data are expressed in terms of the density of *O. mykiss* (trout per mile), the numbers reveal a very depressed total *O. mykiss* population when compared with other California rivers draining the Sierra Nevada, or other rivers in the western U.S.[184]

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[180] Exhibit No. NMF-6 at. 5.

[181] Tr. at 328.

[182] Exhibit No. DFG-4; Exhibit No. DFG-7.

[183] Exhibit No. NMF -48; Exhibit No. NMF-51.

[184] Exhibit No. NMF-55.

Finding 274 does not adequately consider that, should anadromous behavior commence among *O. mykiss*, Project-controlled factors influence outmigration success. The testimony of Dr. Gordus points to unsuitable emigration conditions in the lower Tuolumne, due to the fact that warm water decreases its dissolved oxygen concentrations and these low levels can act as an oxygen barrier to migration.[185] In other words, at some point when the water temperatures rise downstream (due to inadequate cold water releases from the Project) fish emigration is negatively affected because the fish cannot sufficiently oxygenate their gills (breathe). Elevated temperature conditions may also provide good predator habitat downstream that precludes successful emigration of *O. mykiss* by providing optimal habitat for species like pikeminnow, striped bass and black bass.[186]

These conditions in the Tuolumne that influence the successful expression of anadromy provide the Commission a very different scenario from the "choosing to stay" testimony of Wilcox,[187] which attributes this choice to favorable conditions in the lower Tuolumne versus unfavorable conditions in the Delta. Dr. Lindley testified that dam operations and other management strategies that more closely recreate historical hydrologic and geomorphic processes are to be favored because they promote the expression of anadromy in a species, which reflects higher diversity (and fitness) than expression of resident behavior.[188] In his oral responses to examination, Dr. Lindley emphasized the importance of implementing the Agencies' Interim Measures to improve conditions for CV steelhead. The Agencies propose to adjust Project operations in an adaptive way to encourage increases in both the total *O. mykiss* numbers in the Tuolumne River and the numbers of individuals successfully exhibiting anadromous (steelhead) behavior.[189] Moreover, the Commission should consider that improved Tuolumne River flows are capable of influencing freshwater habitat conditions downstream to and within the Delta.[190] Flow contributions from the upper San Joaquin mainstem and the

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[185] Exhibit No. DFG-4, Gordus Direct at.11;18-20 (citing Exhibit No. DFG-11, Hallock 1970).

[186] Exhibit No. DFG-4, Gordus Direct, at.13; 4-10.

[187] Final Report at ¶ 96.

[188] Exhibit No. NMF-6 at 5, Lindley Direct.

[189] Tr. at 332, Lindley Oral Testimony.

[190] Exhibit No. NMF-28.

Stanislaus River have recently increased. Together with improved Tuolumne flows, continued VAMP releases, and improved Merced River flow contributions (as a result of near-term FERC relicensing) flow conditions downstream to and within the Delta could be appreciably improved.

The Commission should disregard the conclusion within Finding 274 that it is not clear that additional flow increases would lead to increased populations of anadromous *O. mykiss* in the Tuolumne. This statement is difficult to consider as a **finding**, as there is almost never a guarantee of an outcome following an action. Nevertheless, Agency testimony explained how: 1) temperatures in the lower Tuolumne are impaired for *O. mykiss* based on several years of instream measurements and comparisons of the data against their physiologically-based thermal criteria;[191] 2) river temperatures are flow-dependent and the higher flows proposed as Interim Measures would improve thermal conditions;[192] 3) higher overall *O. mykiss* populations would produce more CV steelhead even if one assumes the ratio of anadromous-to-resident forms remain unchanged;[193] 4) improved conditions in the Tuolumne River would improve the ratio of anadromous-to-resident forms by increasing total *O. mykiss* population numbers and competition for limited resources, promoting migratory behavior;[194] and 5) Project operations that more closely mimic or recreate historical hydrologic and geomorphic processes will likely favor anadromy.[195] In addition, Dr. Moyle testified that steelhead produce many more eggs than resident *O. mykiss*, implying that as Tuolumne steelhead numbers increase, the abundance of their progeny could increase faster than the numbers of resident progeny.[196] More than sufficient information exists on which to base the adaptive management measures proposed by the Agencies; adaptive management does not require certainty in the outcome of an action prior to implementing that action.

The Commission should notice several discrepancies in the Report that undermine its accuracy with regard to the behavior of the *O. mykiss* species. For example, paragraphs 88, 94,

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[191] Exhibit No. DFG-4, Gordus direct; Exhibit No. DFG-7.

[192] Exhibit No. DFG-4; Exhibit No. FWS-4.

[193] Exhibit No. DFG-4.

[194] Exhibit No. NMF-6.

[195] *Id*.

[196] Exhibit No. CSF-1 at 9.

and 105 reference testimonies that do not contain information to support a finding that *O. mykiss* may be choosing to stay in the Tuolumne. Paragraph 88 contains only an assertion that several factors may affect anadromy. Paragraph 94 contains assertions about predation of *O. mykiss* on juvenile Chinook salmon, and the abundance and distribution of *O. mykiss* in the lower Tuolumne before and after 1996, but no information that would inform analysis of how *O. mykiss* may be choosing to stay in the Tuolumne. Paragraph 105 recounts the testimony of Mr. Wilcox rebutting the direct testimony of Mr. Heyne over the issue of the decline of lower Tuolumne River steelhead. The text concerns studies, the precision of estimates of *O. mykiss*, and claims that *O. mykiss* populations have increased since flows were adjusted in 1996. None of this information supports the Report's Finding 274 that *O. mykiss* may be choosing to stay in the Tuolumne.

In addition, Paragraph 96 contains the claim of Wilcox also found in written testimony,[197] and adopted as a conclusion in Finding 274: "[M]ost lower Tuolumne River *O. mykiss* choose to stay in freshwater because the probability of survival is higher." Paragraph 96 also recounts testimony of Mr. Wilcox that low rates of anadromy in Tuolumne *O. mykiss* (and in other San Joaquin basin tributaries) suggest that anadromy is not currently competitive with freshwater residency as a life history strategy. Finding 274 appears to adopt the views expressed in paragraph 96, by Mr. Wilcox, and does not include a full review of all relevant testimony. Finding 274 omits reference to, or analysis of, the written and oral testimonies of Dr. Lindley, a recognized expert in steelhead ecology and their status in the Central Valley of California.[198] Dr. Lindley provides key facts in his testimony and citations that would enlighten analysis of Finding 274. While Dr. Lindley's testimony regarding steelhead is summarized in paragraph 239, the Report does not adequately recount the information he provides concerning anadromy in *O. mykiss*, including explanation of the fitness consequences of anadromous behavior in an evolutionary context, how the abundance of other fish in the stream (and other factors) influence anadromy, and how Project dam and other facilities operations could be re-operated to more closely mimic historical hydrologic and geomorphic processes that favor anadromy.

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[197] Exhibit No. DIS-28 at. 6-7.

[198] Final Report at ¶ 40.

Mr. Wilcox also testifies that low rates of *O. mykiss* anadromy in the Tuolumne River and other San Joaquin basin tributaries suggest that anadromy is not currently competitive with freshwater residency as a life history strategy. This assertion should cause a careful reviewer to consider whether improved conditions for *O. mykiss* (e.g. through Interim Measures that change Project operations) might improve upon the low, current rates of anadromy.

Finding 274 referenced the statements of Dr. Moyle (CCSF consultant) that if river conditions are good, this may "trigger" *O. mykiss* to stay and not go out to sea.[199] Dr. Moyle cited the results of recent studies from the upper Sacramento River - suggesting that one should draw the conclusion that if conditions are good, *O. mykiss* won't migrate; rather they will stay in the river. This simplistic explanation influenced Finding 274, and the Report failed to probe deeper into the actual evidence that supports a very different conclusion.

Specifically, a close comparison of Dr. Moyle's assertions alongside Agency testimony, with respect to the otolith microchemistry analyses from the upper Sacramento River, reveals that Dr. Moyle's conclusion is in error.[200] The study of the otoliths [201] of *O. mykiss* sampled in the upper Sacramento River found that nearly **one-half** of the age-1 fish were of steelhead maternal origin,[202] conclusively refuting any assertion that good river conditions suppress the expression of anadromy in its *O. mykiss* population.

Mr. Wilcox highlights the low rate of anadromy (1 adult out of 148 fish) observed in the Tuolumne River and other San Joaquin basin tributaries. If Finding 274 accepts that anadromy is occurring at low rates in the Tuolumne River, then it follows that existing conditions under Article 37 flows are hardly beneficial for CV steelhead, and measures intended to promote anadromous (steelhead) behavior are warranted. Therefore, the Commission should consider

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[199] Tr. at 341-343, Moyle Oral Testimony.

[200] Exhibit No. NMF-32, Zimmerman et al. 2009, at 287, Figure 5.

[201] Use of chemical "markers" in fish otoliths can test for anadromy in *O. mykiss*, and can very reliably verify or reject assumptions regarding freshwater versus ocean residence of *O. mykiss* sampled from a river. Examination of the chemical markers can identify the maternal origin (resident versus anadromous) and the migratory history (resident versus anadromous) of individual fish.

[202] Exhibit No. NMF-32, Zimmerman et al. 2009, at 287, Figure 5

adoption of the Agencies' Interim Measures proposals for Project flow release changes, for the benefit of the CV steelhead fishery.

The Commission should also consider the interpretations of Mr. Wilcox in the context of the purpose and results of the otolith studies. In the studies, 11 of the 146 fish sampled in the Tuolumne were identified as having anadromous (steelhead) maternal origin. [203] One of these eleven fish displayed an anadromous migratory history. Zimmerman et al. noted that smolt emigration occurs among the younger fish in a population, and so it would be expected that steelhead of maternal origin would be rare among the older (adult) *O. mykiss*;[204] the authors cited the example of the Sacramento River, where the progeny of CV steelhead were found to be abundant at age-1 and age-2, but rare among fish older than age-2 fish. The Commission should note that the Agencies' Interim Measures recommended that monitoring adult CV steelhead should be performed using counting weirs to assess their numbers returning to spawn in the Tuolumne River.[205]

The Commission should also closely evaluate the suggestion of Mr. Wilcox that low survival rates of *O. mykiss* smolts in the Delta and ocean (factors outside the Tuolumne and the scope of this Proceeding) compared to the survival of resident *O. mykiss* in the Tuolumne River would explain the low rates of anadromy of *O. mykiss* in the Tuolumne River. In oral testimony Dr. Mesick explained that there is solid evidence that other San Joaquin tributaries (e.g., the Stanislaus and Calaveras) which have relatively higher, colder summer flows than the Tuolumne produce higher percentages of CV steelhead progeny than does the Tuolumne.[206] The Commission should note that both the Calaveras and Stanislaus rivers (like the Tuolumne) flow to the lower San Joaquin River; therefore CV steelhead migrants originating in the Calaveras and Stanislaus would share a substantial common pathway through the lower San Joaquin and Delta with migrants originating in the Tuolumne. Mr. Wilcox's contention that low rates of anadromy

[203] Order on Rehearing at p. 61,149, ¶58.

[204] Exhibit No. NMF-32, Zimmerman et al. (2009) at 288.

[205] Exhibit Nos. DFG-1; FWS-1; NMF-1.

[206] Tr. at 293-295; Exhibit No. NMF-32, Zimmerman et al. 2009, at 287 Figure 5.

in the Tuolumne are due to low survival in the Delta are thus not supported by otolith study results.

Finding 275. The Tuolumne Chinook salmon population may be subject to extirpation, but is not at risk of extinction pending relicensing. Recent declines in Chinook salmon escapement levels are comparable to those occurring in other San Joaquin River tributaries and based on past patterns of high and low spawning returns, escapement levels in the Tuolumne River and other tributaries, are likely to rebound. More monitoring is needed to determine what factors, in addition to instream flows, are adversely impacting the salmon.

Comment:

Finding 275 makes several assertions that require separate analysis not found in the Report, and which should be evaluated by the Commission:

a) *The Tuolumne Chinook salmon population may be subject to extirpation, but is not at risk of extinction pending relicensing;*

b) Recent declines in Chinook salmon escapement levels are comparable to those occurring in other San Joaquin River tributaries;

c) Based on past patterns of high and low spawning returns, escapement levels in the Tuolumne River and other tributaries are likely to rebound; and

d) More monitoring is needed to determine what factors, in addition to instream flows, are adversely impacting the salmon.

The comments below are ordered to provide analysis to the individual assertions within Finding 275.

a) *The Tuolumne Chinook salmon population may be subject to extirpation, but is not at risk of extinction pending relicensing*

The testimony and supporting information of Dr. Mesick analyzed the extinction risk to the fall-run Chinook salmon population in the Tuolumne, applying published criteria,[207] and found the risk of extinction to be "high".[208] Dr. Lindley's testimony corroborated Dr. Mesick's application of the extinction risk criteria; but the Report brushes aside this corroboration in favor of Dr. Hume's contentions that the extinction risk should be assessed only on a Central Valley-wide or ESU-wide basis.[209]

Finding 275 references without analysis paragraph 87, which summarizes Dr. Hume's contention that extinction risk should be assessed ESU-wide (Central Valley-wide) based on the fact that the Tuolumne population is not recognized as an ESU or DPS separate from the CV fall- and late fall-run Chinook ESU. While it is correct that the Tuolumne population is not recognized as an ESU separate from the Central Valley ESU, it is incorrect to assert that the Tuolumne population cannot be individually analyzed for risk of its extinction; Hume's assertion is based on a misunderstanding of the extinction risk assessment framework of Lindley et al.[210] and its application by Dr. Mesick. Lindley at al. (2007) clearly identify that their framework applies to populations and ESUs, where:

> 1) population-level viability assessments are performed to classify **populations** as extinct, high extinction risk, moderate extinction risk, etc.;[211] and
>
> 2) ESU-level assessments of viability are based on the number of populations that exist within the ESU, **the status of the populations within the ESU,** the spatial arrangement of populations with respect to each other, the spatial arrangement of the populations with

[207] Exhibit No. NMF-8, Lindley et al. 2007.

[208] Exhibit Nos. FWS-4; FWS-50.

[209] Final Report at ¶ 87.

[210] Exhibit No. NMF-8.

[211] *Id.* at 3 (emphasis added).

respect to sources of catastrophic disturbance, and the diversity of the populations and their habitats.[212]

Therefore, the conclusions of Finding 275 should not have relied on testimony that shifts emphasis to ESU-level considerations of extinction risk, and away from the Chinook salmon population **in the Tuolumne River**. Rather, Finding 275 should have more closely considered the testimonies of Mesick and Lindley that reveal a Tuolumne Chinook salmon population at **high risk** of extinction – and directly influenced by freshwater conditions **in the Tuolumne** and **under the control of the Project.**

Finding 275 asserts that the Tuolumne Chinook salmon population may be subject to extirpation, "but is not at risk of extinction pending relicensing." This statement is asserted as a finding of fact without any explanation. But any implication that the risk of extinction is not imminent is contradicted by factual testimony.

The testimony and supporting information of Dr. Mesick,[213] corroborated by the testimony of Dr. Lindley,[214] demonstrate that the Tuolumne's fall-run Chinook salmon population is at a "high risk" of extinction. The viability assessment framework Dr. Mesick applied (and Dr. Lindley and others established) assigns no greater risk assignment than "high risk of extinction"; the next assignment is "extinct in the wild."[215] The viability framework also clearly identifies its risk categories from "high" to "low" correspond to specific risks of extinction within specific time horizons, and so a "high" risk of extinction means the risk is most imminent. The Report's paragraph 190 noted that Dr. Mesick's analysis indicated high risk scores within all four categories analyzed in the viability framework of Lindley et al., while an overall high risk of extinction is justified if the risk score is "high" for any single category.[216] The written testimony of Dr. Lindley further explained the four risk categories:

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[212] *Id.* at 7 (emphasis added).

[213] Exhibit No. FWS-4.

[214] Exhibit No. NMF-6.

[215] Exhibit No. NMF-8, Lindley et al. 2007 at 3.

[216] Exhibit No. NMF-8, at 4, Table 1.

1) population size criteria are intended to capture the risk caused by loss of genetic diversity;

2) population decline criteria capture the risk to populations of low or negative growth rates;

3) catastrophe criteria are meant to capture the temporarily high risk of extinction that can face a formerly secure population in the face of some disaster;

4) hatchery criteria are meant to capture the risk posed from hatchery environments because gene flow from the hatchery can overpower natural selection in the wild population, causing fitness in the wild to decline.[217]

Regarding consideration of Delta conditions that affect this population, improved Tuolumne flows such as those recommended in the Agencies' Interim Measures would incrementally improve Delta flows and conditions.[218] Regarding consideration of ocean factors that affect this population, the scope of this proceeding was to evaluate measures that could be implemented **in the Tuolumne River** to improve conditions for the fishery, and the Project does not appear to exert any measureable effect on ocean habitat conditions.[219]

b) Recent declines in Chinook salmon escapement levels are comparable to those occurring in other San Joaquin River tributaries

Dr. Mesick's oral testimony provided both explanation of declines and qualification regarding the degree of declines. Levels of escapement in the San Joaquin River tributaries exhibit similar cycles of salmon escapement [220] due to increased instream flow releases on all three major tributaries in wet years that improve juvenile survival. However, the escapement levels on the Stanislaus do not drop as low as they do on the Tuolumne, because across water years there are higher instream flows on the Stanislaus. There will always be more fish on the Stanislaus because the fluctuations are not as extreme.[221]

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[217] Exhibit No. NMF-6 at 7.

[218] Exhibit No. NMF-28; Moyle Oral Testimony, Tr. at 334:17-18.

[219] Exhibit No. NMF-2.

[220] Mesick, Oral Testimony, Tr. 239:12

[221] Mesick, Oral Testimony, Tr. 251:8-19.

A common factor that likely negatively affected the recent (2007, 2008) fall-run Chinook salmon escapement levels across the Central Valley were the poor ocean habitat conditions experienced by the 2004 and 2005 broods of juvenile salmon;[222] however, the Commission should recognize that the rapid and likely temporary deterioration in ocean conditions (proximate cause) acted on top of a long-term, steady degradation of the freshwater and estuarine environments (ultimate causes of decline).[223] While no claims have been made that the Project exerts any measureable effect on ocean habitat conditions,[224] the Project has been found capable of influencing freshwater habitat conditions downstream to the Delta.[225] The oral testimony of Dr. Moyle suggests that releases from the Project through the Vernalis Adaptive Management Program (VAMP) process could influence conditions for salmon in the Delta.[226]

c) Based on past patterns of high and low spawning returns, escapement levels in the Tuolumne River and other tributaries are likely to rebound

The above assertion in Finding 275 appears to have been adopted from the paragraph 76 Report summary of the testimony of Dr. Hume, which contains several statements: a) the Tuolumne and other tributaries have experienced population scares in the past when spawner levels dropped below 1,000; b) population sizes in all three tributaries have dropped below the minimums necessary to maintain genetic viability in several past periods, but have rebounded within a few years; c) "extinctions" and later re-establishment of new populations by straying among the tributaries have regularly occurred in the San Joaquin River basin; and d) recent reports indicate improved ocean conditions that (along with recent restrictions on Delta exports) may lead to gradual recovery of salmon populations. In apparently adopting these assertions to reach its conclusions, Finding 275 appears to downplay the current status and long-term population decline of the Tuolumne River salmon by accepting as regular, ordinary, or

[222] Exhibit No. NMF-9, Lindley et al. 2009.

[223] *Id.*

[224] Exhibit No. NMF-2 at 7, Strange direct.

[225] Exhibit No. NMF-28.

[226] Tr. at 334:17-18.

temporary the observed cycles of near extinction and repopulation (by strays, as summarized in paragraph 76).

Such a conclusion is not only unsupported, it is unsupportable. The Commission should not consider the extinction of a salmon population acceptable. The Commission should not find it appropriate to sanction the status quo when a population faces a high risk of extinction.

The Commission should consider that Finding 275 fails to cite the written testimony of Dr. Lindley that explains the context for interpreting cycles in Chinook salmon abundances (such as those described by Hume and summarized in paragraph 76).[227] Lindley explains that the "boom-bust" dynamics of Chinook salmon in the CV are driven by relatively rapid changes in the terrestrial climate (higher abundances occur during wet periods and lower abundances during dry periods) and ocean climate, but that these relationships tend to obscure underlying, longer-term trends of declining freshwater habitat quality and declining fitness of the populations. He explains, through a conceptual model,[228] that sustainability of a population depends on stabilizing three factors: 1) the natural production of salmon in the river; 2) the fitness of the population; and 3) the effects of terrestrial climate variation -- at levels that prevent the population from becoming vulnerable to extinction.

Dr. Lindley is the first author of a comprehensive NOAA Technical Memorandum evaluating of the causes of the recent collapse of fall-run Chinook salmon in the Central Valley.[229] The Commission should review the conceptual model offered by Dr. Lindley,[230] which is presented to graphically display the fluctuations in Chinook salmon abundances in the complete context of declining freshwater habitat conditions, hatchery influences that reduce population fitness, climate changes, and increasing sensitivity to environmental variation due to loss of life-history diversity.

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[227] Exhibit No. NMF-6 at 10.

[228] *Id.* at 13, Figure 1.

[229] Exhibit No. NMF-9, Lindley et al. 2009.

[230] Exhibit No. NMF-6 at 13, Figure 1.

Finding 275 is deficient in adopting the position that a population may "bounce back" when ocean conditions improve, without considering the full cycle presented in the Lindley model, which suggests that "booms" like those described by Hume are followed by "busts" where populations decline to new record low levels when ocean conditions again decline. The Commission should consider that these predicted population "busts" are likely because of long-term deterioration of freshwater habitat conditions, decreased production of naturally-spawned salmon in the Tuolumne, and declining fitness of the remaining population due to hatchery influences. The Agencies' proposed Interim Measures are proposed actions that can be implemented **in the Tuolumne River** and **by the Project**, and are intended to improve its habitat conditions (water temperatures, floodplain inundation), increase production of naturally spawned salmon (improved fry survival, greater smolt production, improved outmigration success), and ameliorate hatchery influences (adult attraction flows to reduce straying of hatchery fish).

The Commission should disregard information in the Report that is incorrect or not backed by substantial evidence. For example, Dr. Hume's assertion that historic flows unimpaired by dams limited the suitability of temperatures "at various points" for Chinook salmon[231] is not supported by evidence. Dr. Hume also incorrectly asserts that the testimony of Dr. Gordus regarding Tuolumne temperature impairment should be disregarded because he ignored the challenge of the San Joaquin River Group;[232] the Commission should review and consider the detailed response to the Group and others provided in Exhibit DFG-14. The Commission should note that Dr. Hume asserts that model simulations show that proposed flows for temperature maintenance would "eliminate the cold water pool in the Reservoir,"[233] implying that existing temperature models are capable of predicting what amount of flow will sufficiently reduce water temperatures (contradicting the Report's Finding 272). The Commission should consider that Hume's assertion in paragraph 84, that Mesick's assessment of extinction risk "does not address the effects of hatchery introductions on Tuolumne Chinook salmon and the influence of in-breeding," is incorrect because the risk categories established by Lindley et al.

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[231] Final Report at ¶ 82.

[232] *Id.* at ¶ 80.

[233] *Id.* at ¶ 81.

(2007) and applied by Dr. Mesick include assessment of hatchery influences that can overpower natural selection in the wild population, causing fitness in the wild to decline.[234] The Commission should reevaluate Hume's assertion in paragraph 84 that use of instream flows to compensate for the Merced River and other hatchery influences is a factor that is not within the control of the Districts; this assertion is incorrect because flow releases for attraction of immigrating, naturally-spawned adults are within the control of the Project, and are proposed as Interim Measures.[235]

d) More monitoring is needed to determine what factors, in addition to instream flows, are adversely impacting the salmon

The above assertion in Finding 275 appears to adopt the testimony summarized in paragraph 75 that more monitoring is needed to better evaluate other factors that are adversely affecting population levels of Chinook salmon in the lower Tuolumne and that - according to the Districts' consultant Hume - there is no way to obtain a credible assessment of the effectiveness of any interim flow measures until this happens.

We disagree. The Licensees have conducted monitoring for 40 years. More monitoring has been done in this river than in virtually any relicensing proceeding in history. Of course there are other limiting factors, and of course monitoring (which is not the same as a controlled experiment) has not resolved to statistical reliability how flows rank. Nevertheless, we know enough to realize that Article 37 flows cause continuing adverse impacts on fish habitat and life stages in lower Tuolumne River. The ten-plus years between the Settlement Agreement and the present saw a heavy emphasis on non-flow measures to improve the situation, but populations of salmon and *O. mykiss* have crashed.

The Commission must acknowledge that decades of study have not proven sufficient to meet its own threshold of certainty.[236] In an attempt to break this cycle, the Agencies are proposing adaptive management, including implementation of interim flows, that are

[234] Exhibit No. NMF-8 at 4, Table 1.

[235] Exhibit Nos. DFG-1; FWS-1; NMF-1.

[236] Order on Rehearing.

accompanied by monitoring studies for the focused purpose of assessing and adjusting the flows as necessary. To delay on the basis that more study or predictive modeling is necessary prior to taking remedial actions is to repeat the failed policies of the past.

Finding 276. Salmon and steelhead (the latter to a lesser degree) benefit from seasonal floodplain habitat, but Article 37 minimum flows may not provide adequate inundation of floodplain habitats, especially in drier water years to produce sufficient forage, support growth, or enhance the predator avoidance environment necessary to promote juvenile steelhead survival.

Comment:

Finding 276 recognizes the benefit to fish resulting from flows that inundate floodplain habitat, but fails to acknowledge the means by which such flows would be provided (the Agencies' Interim Flow Measures). Instead, the Finding analyzes only whether current Article 37 flows provide the recognized benefit. This Finding fails to fulfill the direction of the Commission in ordering this proceeding; *i.e.*, determining "any interim protective measures, including minimum flows that may be needed to improve conditions for the fishery resources."[237]

Finding 276 correctly states the benefits of Tuolumne River floodplain inundation for anadromous salmonids, but does not acknowledge the need for the Interim Flow measures proposed by the Resource Agencies to achieve these benefits. Finding 276 is incorrect in stating only that Article 37 minimum flows *may* not provide adequate inundation of floodplain habitats. Rather, as noted in paragraph 189, it is clear that Article 37 minimum flows *do* not provide benefits from inundation of floodplain habitats in drier water years. In wetter years, floodplain inundation occurs as a result of releases for flood control and spill control, not of releases required under the Article 37 minimum flows.

Finding 276 also does not account for the fact that a threshold of 3,000 cfs is needed to inundate floodplain habitats, as noted in paragraph 191, and thus that Article 37 minimum flows

[237] Order on Rehearing at ¶ 99.

do not provide *any* floodplain inundation in drier years. In contrast, the Interim Flow measures proposed by the Resource Agencies and Conservation Groups provide floodplain inundation, with resulting benefits for juvenile anadromous salmonids, by requiring flows of 3,000 cfs during late February and/or early March.[238]

The conclusion of Finding 276 that steelhead benefit to a lesser degree from seasonal floodplain habitat is erroneous and is not supported by the paragraphs cited by Finding 276. In contrast, based on paragraph 187, steelhead and Chinook salmon would be expected to benefit similarly from floodplain inundation due to their similar habitat requirements.

Finding 276 does not consider Agency testimony summarized in paragraphs 187, 189 and 191. Late winter 3,000 cfs pulse flows, which inundate about 500 acres of floodplain habitat, promote smolt survival in the lower Tuolumne River by at least doubling the number of smolts that migrate from the river and by increasing the percentage of smolts that migrate by mid-April, when Delta conditions are most suitable for their survival.[239]

Paragraph 86 (cited as a reference in Finding 276), is erroneous in suggesting that existing floodplain habitat in the upper 30 miles of the Tuolumne River downstream of LaGrange Dam is not suitable for anadromous salmonid rearing. Substantial portions of the 3,100 cfs overbank inundation area (cross-hatched areas in Exhibit No. FWS-85) are clearly shown as vegetated in 2005 National Agricultural Imagery Program imagery.[240] Such areas would have high suitability for cover, which is an important microhabitat feature, and would likely have low velocities due to high roughness values as a result of the vegetation. In addition, an approximate maximum depth in these inundated areas can be calculated from the difference in the height of water at the flow gage downstream of LaGrange Dam at 3,100 cfs (9.33 feet) and 1,100 cfs (6.54 feet), since the overbank areas were dry at 1,100 cfs. On this basis, these inundated areas have depths of less than 2.8 feet. Based on the U.S. Fish and Wildlife Service's Yuba River fall/spring run Chinook salmon fry habitat suitability criteria, depths of less than 2.8

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[238] Final Report at ¶ 191.

[239] Exhibit No. FWS-6 at 10-11, 13-14; FWS-82 (USFWS 2008b) at 9, Figure 3; Tr. at 306:17-25 (Gard).

[240] Exhibit No. FWS-85 (U.S. Fish and Wildlife Service 2009).

feet would be good quality habitat (suitability of greater than 0.69)[241] for Chinook salmon fry.[242] Thus, Exhibit No. FWS-85 shows that a substantial portion of the overbank inundation area at 3,100 cfs (particularly between river miles 38 to 50) likely has the appropriate type of microhabitats present for juvenile anadromous salmonid rearing.

Exhibit No. FWS-54 (Moyle et al. 2007) gives the following recommendations related to flow regimes and Central Valley floodplains:

> "Central valley floodplains managed to favor native fishes should have the following characteristics: (1) extensive early season flooding, (2) complete drainage by the end of the flooding season, (3) few areas with permanent water, (4) a mosaic of physical habitats, (5) regular annual flooding but with high variability in flood regime."

Exhibit No. FWS-54 (Moyle et al. 2007) defines early season flooding as early January through April, and also states:

> "Where flooding can be regulated, providing at least some flooded area each year is desirable, especially for the rearing of juvenile Chinook salmon."

The flows recommended in the Interim Flow Measures proposed by the Resource Agencies would be consistent with the above recommendations by providing floodplain inundation in all years, which benefit fish populations by increasing food supply, increasing growth rates which may allow earlier smoltification and thus greater success in emigration, and providing refuge from predators, all of which would assist in preventing localized extinction and/or assist in increasing populations of anadromous fish in the Tuolumne River.

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[241] Habitat suitability criteria values range from 0 (completely unsuitable) to 1 (optimal suitability).

[242] Exhibit No. FWS-84 (U.S. Fish and Wildlife Service 2008c).

Finding 277. Factors outside of the Tuolumne River affect the survival of anadromous O. mykiss and Chinook salmon. Those factors, among other things, include: inland, commercial, ocean, and sport harvest; unscreened riparian water diversion; entrainment and predation of outmigrant smolts at state and federal pumping facilities; low dissolved oxygen; lack of suitable habitat in the ship channel; water pollution; hatcheries; and climatic factors affecting ocean food production. It would not be possible for flow levels to overcome all of these and other out-of-river factors before relicensing.

Comment:

By themselves, additional Don Pedro flow releases may not overcome **all** other limiting factors at a population level, in the ordinary sense of completely ameliorating all external adverse conditions. But that is wrong legal standard. The Licensees must mitigate project impacts on life stages and habitat within the river reach under project influence. FERC may not permit adverse project impacts on a scale that causes extirpation from that reach, on grounds that other limiting factors downstream might also contribute to extirpation elsewhere. That is "tragedy of commons" logic, where a regulator (in this case FERC) permits one user to deplete the commons on grounds that other regulators are permitting other users to do the same.

Temporal conditions in the ocean and Delta do not excuse the Licensees or the Commission from decades of direct adverse impacts on anadromous fisheries resources downstream of the project. There is extensive evidence that the recommended Interim Measures would substantially enhance anadromous fish populations in the lower Tuolumne River. Dr. Moyle's statement [243] that there are no "guarantees," and the notion that interim flows must be capable of overcoming all of the limiting factors before relicensing, create a threshold for affirmative action that is unreasonable.

In reaching its conclusion, finding 277 references paragraphs 51, 68-69, 71-74, 85, 87, 141, 248, and 255, relying entirely on non-agency testimony. Paragraph 51 summarizes the testimony of Mr. Nees, Director of Water Resources and Regulatory Affairs for the Turlock Irrigation District. Paragraphs 68-69, 71-74, and 87 recount the testimony of Dr. Hume, a

[243] Moyle Oral Testimony, Tr. at 337:11-15

consultant to the Districts. Paragraphs 248 and 255 summarize and recount the testimony of Dr. Moyle, on behalf of the CCSF. The sole reference to the testimony of witnesses other than those for the Districts or CCSF was that of Ms. Boucher (Paragraph 141), of the Friends of the Tuolumne.

In Finding 277, no reference is made to the written or oral testimony of Dr. Lindley, who holds a Ph.D. in Biological Oceanography, and whose occupation is to conduct and supervise research on the ecology of anadromous fishes. Dr. Lindley is uniquely qualified to speak on the issue of factors within and outside of freshwater environments (such as the Tuolumne) that could affect the survival of anadromous *O. mykiss* and Chinook salmon, as he is leading a review of the factors behind the collapse of the CV fall-run Chinook salmon in the Sacramento River.[244] A recent product of this review is a 2009 NOAA Technical Memorandum that investigated the potential causes (both in-river factors and ocean factors) of this collapse.[245] Given that Dr. Lindley is the first author of this comprehensive evaluation, **on an issue highly germane to the topic of Finding 277**, it is a glaring omission that his testimony is referenced nowhere in Finding 277, nor is any analysis of his testimony on this subject found in Finding 277. Likewise, the testimony of Dr. Mesick is not referenced or analyzed in Finding 277. Dr. Mesick holds a Ph.D. in Fisheries Sciences and has 28 years of experience as a fisheries scientist, implementing instream flow studies, salmonid population studies, and salmon habitat restorations in California since 1985. He was responsible for the oversight of habitat restoration projects on the Tuolumne for 4 years while working for FWS' Anadromous Fish Restoration Program, and so has extensive knowledge and experiences specific to the Tuolumne. Dr. Mesick provided extensive written and oral testimony, and information in support of his testimony regarding the factors affecting the Tuolumne River salmon population. His contributions include an analysis of the factors limiting fall-run Chinook salmon populations in the Tuolumne River.[246] Lastly, the testimony of Mr. Heyne of the California Department of Fish and Game is not referenced. Mr. Heyne provided testimony and supporting information detailing more than three decades of scientific analyses of the impacts of the Project on the juvenile salmon life-stage, an in-river

[244] Final Report at ¶ 40.

[245] Exhibit No. NMF-9, Lindley et al. 2009.

[246] Exhibit No. NMF-11, Mesick et al. 2008.

factor that should have been evaluated in the Report alongside testimony regarding factors outside the Tuolumne.[247]

Finding 277 goes beyond the direction it provided in the Order on Rehearing, which limited the scope of this proceeding to "an assessment of the conditions in the Tuolumne River downstream of the Don Pedro Project that may affect these fish, and any interim protective measures, including minimum flows, that may be needed to improve conditions for the fishery resources."[248] The Commission further directed consideration of operational effects of DPP on the fishery resources; interim protective measures to address those effects; information on the cost of implementing such measures; the effects of implementing such measures on other, non-fishery resources, and possible settlement.[249] The Project has control over its facilities and operations, which block fish passage, alter Tuolumne River flows and water temperatures, and thereby influence salmonid habitat conditions in the Tuolumne. The Project does not have direct control over many of the other "outside" factors considered in Finding 277.

The Report does not reference, and should closely consider, the testimony of NMFS Biologist Erin Strange regarding the significant remedial actions that are already underway to address factors outside of the Tuolumne River that affect the survival of its anadromous *O. mykiss* and Chinook salmon populations.[250] In 2008, NMFS closed the West Coast salmon fishery in response to the collapse of the CV fall-run Chinook salmon fishery in the Sacramento River, and it will remain closed until populations rebound. In 2009, NMFS issued a "jeopardy" Biological Opinion and Conference Opinion (BiOp) on the Long-Term Operations of the Central Valley Project and State Water Project (OCAP) for its effects on the CV steelhead DPS.[251] Several reasonable and prudent alternative (RPA) actions were included in the BiOp that address factors outside the Tuolumne to benefit anadromous fishes.[252] One RPA for the Stanislaus River (a San Joaquin tributary north of the Tuolumne) established temperature compliance points to

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[247] Exhibit Nos. DFG-2; 6; 10; 12; 14; 20; 23.

[248] Order on Rehearing at ¶ 99.

[249] *Id.*

[250] Exhibit No. NMF-50 at 6-8.

[251] Available at http://swr.nmfs.noaa.gov/ocap.htm.

[252] Exhibit No. NMF-56.

assure suitable thermal habitats for all life stages of steelhead, and a flow regime to maintain minimum flows to optimize steelhead habitat for all life history stages, provide winter and spring floodplain inundation for rearing, provide migratory cues to smolts, and facilitate out-migrant smolt movements. The BiOp also includes RPA actions in the Delta to reduce the vulnerability of emigrating steelhead within the lower San Joaquin River to entrainment into the channels of the South Delta or at the pumping facilities in the South Delta. The RPA increased the ratio of flow down the San Joaquin River to the Delta (inflow) in relation to the flow pumped out of the system into aqueducts (export). This increase in inflow-export ratio is intended to enhance the likelihood of salmonids successfully exiting the Delta, by improving hydraulic conditions in the mainstem of the San Joaquin River for outmigrating juvenile fish. RPA actions at the Delta fish salvage (collection and release) facilities are intended to improve the survival of juvenile salmonids through modifications of the facilities, operations, and techniques, to reduce pre-screen loss and improve fish screen efficiency. The flow-related requirements described above are to be implemented immediately (beginning in fall 2009) due to the perceived immediate need to sustain and improve the freshwater habitat of steelhead in the Stanislaus River and to reduce entrainment at the Delta facilities. It is anticipated that the structural improvements to facilities will take longer to implement.

The California Department of Water Resources, FWS, DFG, NMFS, and several others are also actively involved in the Bay-Delta Conservation Planning (BDCP) process, which has developed large-scale habitat restoration efforts in the Delta intended to aid in the survival of salmonids by improving rearing habitats, food production, water quality, and reducing suitable habitats for predatory species. In addition, NMFS' Draft Recovery Plan for winter-run and spring-run Chinook salmon and steelhead was released to the public in October, 2009. The Draft Recovery Plan identifies recovery actions needed for each watershed and/or population of ESA listed Chinook salmon and steelhead; specific recovery actions are identified for the Tuolumne River. The results of these actions should also improve habitats for fall-run Chinook salmon.

The flow-related RPAs from the OCAP BiOp will begin to be implemented this fall in the Stanislaus River, San Joaquin River and the Delta, in addition to the interim flow improvements of the San Joaquin River Restoration Program (SJRRP) which are intended to

provide habitat for the reintroduction of fall-run and spring-run Chinook salmon in the section of the San Joaquin River upstream of the Merced River confluence to Friant Dam.

B. Findings related to water supply, irrigation, and economics

General Comment:

In Findings 279 through 290, the Report bases projections of social and economic costs of potential interim measures on unsubstantiated and unstated assumptions. The effects of the Interim Measures are not quantified. Baseline conditions are also not quantified, and baseline conditions are not clearly differentiated from possible effects of the Interim Measures. No evidentiary connection is established between the Interim Measures and many of the findings that describe conditions during water shortage and response to water shortage.

Finding 278. In determining financial, human, and other costs of implementing the Interim Flow Proposal measures, CCFS and the Districts limited their analyses to working from the 1987-1992 drought scenario. Use of this "worst case" scenario is reasonable and is commonly used by drought forecasters. Other available methodologies could provide some information and may be worth considering, but it is prudent to plan for the worst since it is not possible to predict future droughts with absolute accuracy.[253]

Comment:

This Finding is a cornerstone of the Report because it accepts the Districts' and the City's unlikely hydrologic planning scenario as the basis for an array of speculative predictions about the water supply impacts and costs of implementing the recommended interim flow measures. The Commission should devote particular attention to this Finding, as it is the foundation of all of the predicted impacts and costs that are summarized in Findings 279 through 290. These projected impacts and costs are not reliable predictors of actual impacts and costs, because they

[253] Final Report at p.84, referring to ¶¶ 114-16, 122, 148-51, 160-62.

are predicated on suppositions of drought conditions that have an extremely low probability of occurrence.

The description in Paragraph 278 that the use of the Districts' and the City's "worst case" is "reasonable" makes no definition of **how** such a worst-case scenario is reasonably used, or of how it is "commonly used by drought forecasters." The testimony cited in this finding does not support the conclusion. On the contrary, the testimony of Roger Mann states that forecasters should base their decisions on all water year types, and that the District's use of the drought scenario is "a very risk adverse [sic] position that could also result in a substantial overinvestment in the cost of water supply."[254] Paragraph 159 notes that Dr. Mann characterized the approach as "unreasonable."[255] The other paragraphs cited in this finding are not germane to **the manner in which** the Districts' and the City's worst case scenario is used.

While it is "prudent to plan for the worst," that does not mean that any water agency plans its operations for the next two to five years based on the permanent assumption that there will be a drought of unprecedented historic severity. Any domestic water supplier that did so would sell no new water meters. It would institute permanent mandatory water rationing, make permanent restrictions on landscaping, and engage in intensive infrastructure improvements and upgrades to reduce system losses. A supplier of irrigation water would serve no new acreage, offer incentives for fallowing, require mandatory water efficiency upgrades from irrigators, and engage in intensive infrastructure improvements such as completely lining its canals or replacing all of them with pipes. Both types of entities would dramatically increase water rates and severely tier rate schedules, both as disincentives to consumption and to pay for infrastructure.

Both the City and the Districts have taken measures to conserve water. However, the **level and intensity that is implied by permanent drought planning is not evident in the current management of the Districts, the City, or the Bay Area Water Users**. The urban entities in the Bay Area have undertaken a fairly aggressive program to reduce water use while continuing business as usual, including providing for some growth. The irrigation districts have made some improvements with limited expenditures. The price of irrigation water has increased

[254] *Id.* at ¶ 160.

[255] *Id*. at ¶ 159.

in both Districts, but still ranges at prices from $20 to $30 an acre-foot. Mr. Ward's testimony said that the District[s] have lined canals and piped some deliveries, but there is neither quantification of the work accomplished, nor quantification of either plans or opportunities for further improvements.[256] A purveyor of agricultural water that was planning for permanent drought scenarios would have definitive plans to complete canal lining or piping.

A large amount of the agricultural land in the Districts is flood irrigated. While Mr. Ward described efficiencies that the Districts had made in flood irrigation to avoid "operational outflows," there is no evident plan to reduce flood irrigation on a complete or system wide basis.[257]

Water that is saved from agricultural conservation is in demand and made available for urban uses. Ward in DIS-39 states that urbanization in Modesto on former agricultural land results in approximately the same total use of water by MID.[258] At present, this urban use is limited to the City of Modesto, but urban use by TID south of the Tuolumne River has also been proposed and undergone environmental review. Already, there is permanent demand for river water to offset groundwater use. Groundwater is in permanent danger of overdraft. Groundwater also contains constituent elements that make it difficult for the City of Modesto to meet waste discharge standards, particularly for salinity.[259] These permanent issues with groundwater indicate systemic baseline conditions, including over-demand on surface water, which must be addressed by the Districts. Based on records of historic diversions provided by the Districts, these conditions have been almost a century in the making. Many of them predate the existing flow regime in the Tuolumne River. They should not be used to shift the burden onto proposed interim flows for fish.

No water agency actually operates based on a worst-case scenario unless it really is in crisis. Contingency plans are appropriate to cope with drought years, but these plans should include an expectation that water deliveries will be increased in congruence with the status of the

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[256] Tr. at 104. The 1996 FEIS identified, at 3-28, annual water losses for the Districts at over 200,000 afy.

[257] Tr. at 105.

[258] Exhibit No. DIS-39 at 7, Ward Direct Testimony.

[259] *Id*. at 8-9.

water supply combined with realistic probabilities for drought persistence. In finding the Districts' and the City's use of worst-case planning to be reasonable, the Report holds measures to protect fisheries resources to a far more onerous standard than it holds for effects to irrigation, water supply, and potential economic effects of the Interim Measures.

The Commission should not accept the approach promoted by the Districts and the City which requires certainty of success for measures to protect fish, while holding the mere chance of impacts to water supply, and speculated social and economic consequences, to be sufficient cause to disallow measures to protect fish.

Findings 279-282:

Finding 279. About 85 percent of the water that CCSF, through SFPUC, provides to about 2.5 million people primarily in the San Francisco Bay Area counties of San Francisco San Mateo, Santa Clara, and Alameda comes from the Tuolumne River.

Finding 280. If SFPUC were required to provide additional water to the Districts above the current Article 37 flow schedules as proposed by NMFS/FWS, it would have to reduce the amount of water it could deliver to its wholesale and retail water customers. At current delivery levels and with current water supplies and reservoir storages, the regional water system SFPUC operates on behalf of CCSF can be expected to experience up to a 25 percent shortage, 15 to 20 percent of the time, over multiple-year drought sequences. Under a 20 percent system-wide reduction, individual wholesale customers could experience up to a 40 percent reduction in deliveries.

Finding 281. Under a 41 % rationing scenario, SFPUC would cut back discretionary use first. Discretionary water use tends to be relatively low in San Francisco so that a greater proportion of reduction would be required in the residential and non-residential sectors to meet rationing levels. The estimate is that residential per capita consumption would need to be at no greater than 46 gallons per capita per day to minimize total economic loss. That would allow for no outdoor use and would require reductions in water for bathing, and washing clothes and dishes. Under a 51 percent rationing scenario, residential use in San Francisco would be restricted to

38 gallons per capita per day, requiring even greater limitations on water use in the home for bathing and washing clothes and dishes. There would be public health and safety implications.

Finding 282. If water supplies were unavailable or severely rationed for 10 to 30 days (and possibly as long as 60 days), losses have been estimated as likely being in excess of $28.7 billion in the San Francisco Bay Area, including commercial and industrial losses of at least $14.2 billion. Lost consumer and producer surplus resulting from water rationing would be significant and have been estimated at: $471 million annually in the 51% rationing scenario; $314 million at 41 % rationing; $119 million at 20 % rationing; and $53 million at 10 % rationing).

Comment:

In Findings 279-282, the Report makes no evidentiary connection between the hypothetical shortages whose consequences are described and the decreased availability of water that might result from implementation of the Interim Measures. Instead, the Report describes economic consequences that rely on assumptions of shortage presented by witnesses for CCSF and BAWUA. Thus, for example, Finding 281 states what would happen if the City were to suffer reduced water supplies of 41%, but points to no evidence that a 41% reduction has anything to do with the Agencies' proposed Interim Measures.

In paragraph 261, the Report cites witness Steiner of the City and County of San Francisco regarding losses to CCSF and the Bay Area Water Users Association that could be expected as a result of the proposed Interim Measures. However, the Report fails to consider the evidence provided in the oral testimony of CCSF witness Steiner, who stated that he did not know what responsibility CCSF **would actually have** for increased flows, and that his analysis was based on an **assumption** of 52% responsibility that he was instructed to employ.[260] Finding 280 therefore discusses what would happen at current demand levels to SFPUC water supplies "15 to 20% of the time over multiple year drought sequences," but does not describe how the frequency or magnitude of water shortage might change under the Interim Measures. As stated, the finding concludes little more than that during periods of water shortage, SFPUC is sometimes short of water.

[260] Steiner Oral Testimony, Tr. at 314: 13-25 and 315: 1-8.

Finding 281 not only fails to connect the proposed Interim Measures with its water supply scenario, it also overstates the likely social and economic consequences of water shortage given the highly unlikely event that such a situation might come to pass. We refer the Commission to the information in Appendix C: Science News: "We Are Not Alone-Water Scarcity a Worldwide Problem."[261] This Article recounts the report by CALFED Lead Scientist Cliff Dahm on his experience in a recent global conference titled "Water Scarcity and Management under Mediterranean Climate:"

> In particular, Dr. Dahm pointed out that after a seven-year drought that brought reservoirs down to 15 percent capacity in Southeast Queensland, Australia, water restrictions reduced individual use from 106 gallons per person per day, to 37 gallons per person per day. Restrictions applied to pools, lawns, landscaping and other urban use. Inside their homes, for instance, residents learned to take four-minute showers, and to use unused ice cubes and buckets of graywater (wastewater) from showers to water plants. Queensland's present goal is to target per capita water usage to 45 gallons a day. This compares to average daily per capita water use in the U.S. of between 100-150 gallons and in California of more than 230 gallons. California's 20 percent reduction by the 2020 target date would amount to approximately 185 gallons a day.

The speculated drought scenario in the Tuolumne basin is not as severe (in terms of magnitude or duration) as the actual drought in the Southeast Queensland, yet the actual consequences in Queensland were not nearly as severe as those depicted by the Districts' and CCSF's water shortage scenarios. While Southeast Queensland residents endured cutbacks to discretionary water uses and required rational conservation measures among its water users, there was no elimination of water use in the home for bathing and washing clothes and dishes, much less anything that would be comparable to CCSF's speculated billion dollar economic losses.

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[261] Science News: publication of the CALFED Science Program, 2009. www.science.calwater.ca.gov

Finding 283. If the Districts experience a 35 to 37 percent (or greater) shortage in the amount of water they would normally divert to meet the supply needs of irrigation customers, those irrigation customers would be significantly adversely affected, with significant related adverse impacts on groundwater levels, water quality, cost, and instream flows. There would be devastating crop and employment losses.

Comment:

The assumptions made and the connection to the proposed Interim Measures in this finding that discusses the Districts are unstated. Finding 283 states that water supply reductions of 35 to 37% would leave irrigation customers "adversely affected," with very generally described impacts. There is no analysis of how they would be affected. There is no statement that overall value of farm products in Stanislaus County would decrease, because in Stanislaus County, total agricultural income has increased almost every year for 50 years even during times of limited water availability. [262] A statement that any projected changes to water supply would be "devastating" is not self-supporting, and without explanation, should not be accepted by the Commission.

Finding 284. Complying with Interim Flow Proposals would reduce the Districts' ability to maximize the value of their respective shares of the Don Pedro power plant with a resulting loss of energy and capacity at the power plant requiring costly acquisition of replacement capacity and increase in greenhouse gas emission

Comment:

Lacking a statement of assumptions, this sentence is often not true: there are many years in which the Interim Measures would have almost no effect on power production. The amount of time that it is true, the degree to which it's true at any given time, and quantification of the impacts in different years other than the "worst-case scenario," is not provided.

[262] *See*, Exhibit No. DIS-42, 50 year crop values in Stanislaus County

Finding 285. A reduction in MID deliveries of Tuolumne River water to CCSF would result in increased costs to CCSF. Any alternative sources of surface water acquired by CCSF to offset reductions in deliveries from MID would be far more expensive than the water it currently receives from MID. Increased groundwater pumping to offset reductions in deliveries from MID would require use of more energy-intensive and costly treatment technologies to reduce salinity in the effluent, with associated brine disposal costs.

Comment:

The testimony provides a series of potential hardships in cases of shortage of water, including, generally, expense, groundwater pumping and increased treatment. The finding provides no quantification of impacts in various years. No connection to the proposed Interim Measures is drawn.

Finding 286. Implementation of the Interim Flow Proposal would result in a significant increase in the cost of energy if the hydrology of water years 1987 and 1988 is repeated over the next two water years (October 1, 2009 through September 30, 2011), and the Districts are required to release additional instream flows to meet the terms of the Interim Flow Proposal. Energy reliability would also be impacted.

Comment:

The assumption made for this finding is slightly different, and contemplates a shorter version of worst-case scenario. In two years of drought, operating the system under the Agencies' Interim Measures will necessitate groundwater pumping, and as the reservoir level drops, the system will support less power production. How much of this is attributable to the proposed Interim Measures and how much would occur anyway under current operation during two consecutive critically dry years is not quantified. None of the costs are quantified.

Finding 287. Reduction in water levels in the Reservoir would reduce community recreation opportunities and DPRA revenues. If the Reservoir empties down to "dead storage," recreational usage of the Don Pedro Reservoir would be severely adversely impacted. Boating, recreational fishing, house boating, and other recreational uses would be negatively impacted. Marinas would have to close.

Comment:

The conditions under which Don Pedro Reservoir would reach "dead pool" are not quantified, nor is the frequency with which this might occur. Intermediate scenarios between full pool and dead pool, and potential recreation impacts, are neither considered nor quantified. [263]

Finding 288. SFPUC and the Districts have considered and employed management strategies to address water shortage on an interim and long-term basis. For example, SFPUC has thoroughly considered groundwater. It is planning a groundwater conjunctive use project with three of its wholesale customers to provide groundwater during dry years to augment water supply, but construction of the extraction wells is not anticipated before 2014 and wholesale customers who currently pump from this groundwater basin do not have wells with capacity to pump additional water.

Comment:

SFPUC has been proactive in promoting water conservation and planning. However, the potential water loss to the City and BAWU under the proposed Interim Measures is not quantified.

[263] Tr. at 119:15-120:3.

Finding 289. SFPUC has considered desalination, but does not currently own or operate any desalination plants and does not believe it likely it could bring any desalination plant online before 2016. Neither are water transfers through the Delta a viable option for obtaining more water because of deterioration of the Delta ecosystem with resulting regulatory restrictions. SFPUC has undertaken a multi-billion dollar improvement program to upgrade its water system.

Comment:

SFPUC has been proactive in promoting water conservation and planning, and is currently in the midst of a program to improve many aspects of its water system. However, the potential water loss to the City of the proposed Interim Measures is not quantified. There is no substantiation of the fact that water transfers might not represent a viable option for the City should it find itself seeking additional water. In spite of regulatory restrictions, large amounts of water were transferred through the Delta in 2009. In 2009, a Drought Water Bank was established by the Governor, and federal support was given to a speed-up of regulatory review for transfers. In the last month, the senators from California have spoken in favor of federal legislation that includes facilitation of water transfers in California.

Finding 290. The Districts have made improvements to canal lining, including mechanisms to better measure stream flows and allow for more efficient deliveries, and automation to better measure deliveries to farmers and reduce their operation outflows. Modesto is in the process of designing and constructing three new water tanks and associated pipelines and appurtenances to improve its delivery system. Modesto has metered half of just over 76,000 service connections that will be billed and read as of January 2010. The remaining service connections are expected to be installed about 2017.

Comment:

The Districts are not engaged in long term programs for operations and infrastructure that would suggest that the operating assumption of the Districts is two to five years of prolonged drought emergencies. The Districts' testimony on the contrary seems to suggest that a major issue for the Districts is that increased flow requirements might cause the expenditure of

additional money outside the normal course of business.[264] Neither the accomplishments of the Districts in terms of water conservation and efficiency improvements, nor the opportunity for further improvement, is quantified.

VI.
RECOMMENDED RELIEF

The National Marine Fisheries Service and the U.S. Fish and Wildlife Service put forth jointly developed "Interim Measures Elements" [265] in this proceeding in consideration of the biological requirements of anadromous salmonids during the fresh water stages of their life cycles. These measures are also supported as interim fishery benefits by the California Department of Fish and Game and the Conservation Groups. The proposed Interim Measures address the life stages directly affected by Project operations, and they attempt to identify the minimum alterations that are necessary to provide adequate habitat conditions in order to perpetuate both imperiled species. The Agencies recommend these higher flows within the context of a robust, empirical study protocol aimed at optimizing the balance of flows for both people and fish over the full range of water year types.

The Record shows that both smolt outmigration and adult escapement of anadromous salmonids have been extremely low in recent years. Although the Proceeding failed to achieve a settlement among the Parties, there remains a basis for the Commission to exert its leadership in mediating an agreement on longer-term measures. However, should it not act expeditiously to institute interim measures, the Commission risks extirpation of anadromous fish from the Tuolumne River basin. To avoid this undesirable outcome, the Agencies and Conservation Groups urge the Commission to institute reasonable interim measures for immediate fisheries relief.

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[264] *See*, for example, DIS-71, at pp. 5-6.

[265] See Appendix A: Agencies' Recommended Interim Measure Elements; also supported as interim improvements by California Department of Fish and Game and the Conservation Groups.

In the Final Report to the Commission, Finding 291 states:

> …there are measures aimed at protecting both fish and people that could be tried on an interim basis. The timing and magnitude of Article 37 could be shifted. More studies could be conducted to determine the effects of increased instream flow releases and other modification to project operations on the viability of fall-run Chinook salmon and steelhead populations in the lower Tuolumne River.

The Agencies and Conservation Groups support this finding to the degree that any new interim measures will involve targeted increases in flows - designed to address the recommended Interim Measure Elements described in Appendix A. These measures should be part of a *well-designed* and *well-executed* scientific study package aimed at better defining the limiting factors for anadromous fish in the Tuolumne River. Although adequate flows for all phases of the anadromous life cycle are important, a more detailed study of springtime floodplain inundation flows would be particularly relevant. Also, increased summer flows - based on an extended temperature compliance point - would focus relief on a key habitat need for steelhead that Article 37 has never specifically addressed.

Helpfully, the Commission ordered the Districts to develop a new temperature/flow model. Unfortunately, this Order was instituted during the course of the fact-finding proceeding, allowing very little time for the Agencies and Conservation Groups to provide input to the process. Under the Commission's timeframe, as set out in the Order on Rehearing, the Districts solicited comments on the temperature model and in-stream flow study during the course of the expedited fact finding proceeding. Insufficient time was provided for the Agencies to adequately coordinate with the Districts. Unless the model and study development process is restarted with better opportunities for collaboration, it is doubtful that the results will reflect true, consensus-based consultation.

It is unfortunate that despite concerted efforts, the presiding Judge and FERC's mediator could not facilitate an agreement among the parties on urgently needed interim measures to protect the Tuolumne River fisheries pending relicensing. However, the proceedings have provided additional time and perspective on important facts that are now recognizable before the

Commission. Most importantly, **there is more water available for in stream flow experimentation in the coming year than was portrayed by the Licensees in the Proceeding.**

In support of this assertion are the following, up-to-date indicators:

- The Districts previously identified 25,000 acre-feet of surplus "true-up water" that was previously designated for additional fish flows
- The Don Pedro reservoir at the beginning of 2009 winter season exceeds 107% of its average water storage volume - containing more than 1.4 million acre-feet of carry-over water supply – or approximately 70% of the total maximum reservoir capacity (see Appendix B). [266]
- Early season precipitation in the upper Tuolumne River watershed has been above average – offering promise for an end to prolonged drought conditions the coming water year.
- NOAA's National Weather Service Climate Prediction Center has identified moderate El Nino conditions currently existing in the Tropical Pacific Ocean that are expected to persist into the first half of 2010; thus significantly increasing the chances of higher precipitation events in the Tuolumne River watershed over the next six months.[267]

In light of these harbingers of positive change, the Agencies and Conservation Groups stand ready to engage in further FERC-sponsored mediation and negotiations with the Districts about how to allocate the Tuolumne River water resource in a manner that better reflects the Commission's mandate to equitably balance human beneficial use with the biological requirements of the fisheries resource. In addition, the Agencies propose that a value-engineering study be conducted to determine if there are engineering measures (i.e. better control

[266] Don Pedro Reservoir Storage Levels: Comparison of Current Storage with Historical Wet and Dry Years California. Department of Water Resources, California Data Exchange Center file:///Z:/References%20&%20Tech%20Papers/Drought-water%20usage/Don%20Pedro%20conditions_Dec28,2009.htm

[267] *See* National Weather service climate Prediction Center available at http://www.cpc.ncep.noaa.gov/products/predictions/long_range/fxus05.html

and instrumentation, or structural/mechanical/physical facilities modifications) that could provide more operational flexibility for the Don Pedro Project in the future.

We understand the burden of proof for this proceeding to be less than that required for a license amendment. As discussed in Section IV.E, *supra*, the threshold established by the Commission for this proceeding was a showing that the Project was impairing fisheries in the lower Tuolumne, and if so, that there were actions that could be taken by the licensee to mitigate those impacts. We believe the Resource Agencies and Conservation Groups have shown that Project does impair fisheries in the lower Tuolumne and that the Interim Measures have enough possibility of benefit to warrant the Commission's initiation of a license amendment proceeding as contemplated by the Order on Rehearing:

> After reviewing the report and the parties' comments, we will reconsider the need for interim protective measures pending relicensing, in light of the information developed in this proceeding on interim conditions. We will also consider whether further procedures, such as preparation of an environmental assessment or initiation of ESA consultation, may be needed before any proposed interim measures can be implemented. [268]

The Commission must now render a definitive decision on the request for rehearing of the license Articles and interim relief measures proposed by the Agencies and Conservation Groups. In its decision on the Report, and in the context of the larger Administrative Record that surrounds it, the Commission should:

a) explain the specific evidentiary basis for any finding, including its resolution of any conflicting evidence;

b) state what evidentiary standard it applies to the inherently uncertain science regarding project impacts on fish, and whether it will apply that same standard on relicensing;

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[268] Order on Rehearing, ¶102.

c) state a legal standard for project responsibility in the circumstance where other limiting factors downstream of project influence also affect fish populations and whether it will apply that standard on relicensing;

d) coordinate with State Water Resources Control Board (SWRCB) and the Department of Water Resources (DWR) if it wishes to understand how California water agencies treat hydrologic scenarios for purpose of planning, and secure these agencies' cooperation in the event it decides to initiate a license amendment proceeding and prepare a NEPA document; and

e) as ultimate relief, reopen the license and conduct NEPA, with a decision by 12/2010, on interim flows. A study plan for relicensing should evaluate comparative effects of interim flows in contrast with Article 37 and. other alternatives.

VII.

CONCLUSION

During this proceeding, the Agencies and Conservation Groups provided abundant factual support for the conclusion that the minimum flows required by Article 37 of the license of the Don Pedro Project are still too low and not timed properly, particularly during below average water years, and as a result the Project's reduction of natural streamflow at critical times is contributing to the decline of steelhead and fall-run Chinook salmon in the lower Tuolumne River. Indeed, with the advent of the Don Pedro Project, the anadromous Chinook salmon populations (both spring and fall-run) went from a pre-project, 20-year average of 40,000 adult fish to the most recent lows of only about 200 adult fall-run Chinook for the past three consecutive years. Similarly, anadromous steelhead have been identified in the lower Tuolumne River, but their abundance is also comparatively rare – thus, they have been listed as a threatened species under the federal Endangered Species Act.

The Licensee Parties, on the other hand, relied on arguments based on uncertainty. But because the Don Pedro license conditions are clearly risking extirpation of two federally-managed fish species, FERC cannot rely on the existence of uncertainty, nor on continued studies alone, to justify inaction. The fishery has reached a crisis point. The fish cannot wait for

results of more studies of existing conditions before receiving meaningful flow and temperature relief. If the Commission does not take effective interim measures, it risks responsibility for the extirpation of two species of commercial, social, and cultural importance.

We have been studying the decline of the Tuolumne River fishery for almost fifty years. The Commission admits the past District-sponsored studies were so poorly designed and implemented that they have not yielded any definitive information. More monitoring, while useful, is not needed to justify immediate actions to benefit the species. What **is** needed is a new adaptive management approach in which targeted, increased flows are implemented and monitored through **well-designed** and **well-executed** empirical studies. In light of past failures of the Licensees to provide meaningful science, the time has come for FERC to intercede and ensure that future action-oriented monitoring studies are based on sound science and implemented in a timely fashion.

The presiding Judge in this proceeding was inundated with vast amounts of new information, specialized terminology, and interrelated scientific and economic concepts in a short period of time. Under those circumstances, it is understandable that the task of fully reconciling the complex, conflicting testimonies could not be accomplished within the proceeding's expedited time frame. In the end the Judge did point to certain truths with which the Agencies and Conservation Groups agree; that Article 37 changes the time of year when flow levels peak in the Tuolumne River, which is a concern for anadromous fish because they have different flow needs depending on …their various life stages (Finding 166); that the various life stages of O. mykiss and Chinook require cooler water temperatures (Finding 169); that salmon and steelhead benefit from seasonal floodplain habitat (Finding 172); that the timing and magnitude of Article 37 flows could be shifted, and more studies could be conducted to determine the effects of increased flow releases and other modifications to Project operations on the viability of the fall-run Chinook salmon and steelhead populations in the lower Tuolumne River (Finding 187).

In summation, the Judge said:

> **"…there are measures aimed at protecting fish and people that could be tried on an interim basis…" (Finding 291).**

The Commission has an opportunity to evaluate the new information presented in this proceeding in light of the historical facts, and to exert its leadership in forging a more equitable balance between fishery and non-fishery resources in the Tuolumne River. The Agencies and Conservation Groups encourage the Commission to first stabilize the lower Tuolumne River fishery by ordering enhanced experimental flows, and then to bring about a new era of cooperative research that leads to more equitable water allocation rules for the Tuolumne River. In this way, the Commission can ensure that society's values are properly balanced in such a way that anadromous fish resources can co-exist with hydropower operations and other beneficial uses of the Tuolumne River's fresh water resource.

Respectfully submitted this 5th day of January, 2010.

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Appendix A:

(Presented in the Don Pedro project ALJ Proceeding as Exhibits NMF-1, FWS-1, DFG-1)

National Marine Fisheries Service and U.S. Fish and Wildlife Service

Interim Measure Elements

The following are the National Marine Fisheries Service and the U.S. Fish and Wildlife Service's proposed *minimum* flows, in cubic feet per second (cfs), for the purpose of interim protection of anadromous fishes and habitats in the lower Tuolumne River. [269] Flows are to be released from the Don Pedro Project, with discharges measured at the La Grange Bridge (river mile 50.5).

Element #1: Base flows to improve the quantity, suitability, and consistency (including thermal conditions) of the aquatic habitat for all stages of steelhead.

Action: Year-round minimum flow of 275 cfs, during all water year (WY) types.* In addition, release the greater of the year-round minimum flow (275 cfs) or the flow required to maintain stream water temperatures of 18° C or less** from the LaGrange Powerhouse (RM 52) downstream to Robert's Ferry Bridge (RM 40).

Monitoring: Fish health assessments, snorkeling to develop a quantitative index to abundance for *O.mykiss* (population estimate), investigations of habitat uses by adult and juvenile fish, continuous, 'real-time' temperature monitoring at locations spaced from the LaGrange Powerhouse

[269] These Interim Measure Elements were introduced in the October 2009 ALJ fact-finding proceeding on behalf of the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game as Exhibits NMF-1, FWS-1, DFG-1, respectively.

downstream to Robert's Ferry Bridge, and refinement of a temperature model to predict release flow targets to meet the temperature requirement.

Element #2: Fall flows to improve the migration habitat, including thermal conditions, for adult fall-run Chinook salmon and steelhead, and thereby promote successful immigration.

Action: During all WY types, from Oct. 15 through Dec 1, release the greater of the 275 cfs minimum base flow, or the flow required to maintain stream water temperatures of 18° C or less** from the LaGrange Powerhouse (RM 52) to the San Joaquin River confluence (RM 0). In addition, release a flow of 1,200 cfs for 10 days in mid-October, with the timing of release coordinated with releases from the Merced and Stanislaus Rivers, and the San Joaquin Restoration Program.

Monitoring: Counting weir, fish health assessments, carcass surveys, CWT recovery/analysis, tissue sampling, and continuous, 'real-time' temperature monitoring at locations spaced from the LaGrange Powerhouse downstream to the San Joaquin River confluence (RM 0), and refinement of a temperature model to predict release flow targets to meet the temperature requirement.

Element #3: Spawning flows to improve the habitat (including thermal conditions) for spawning, egg incubation, and alevin stages of fall-run Chinook salmon and steelhead.

Action: During all WY types, from Oct. 15 through Feb. 15, release the greater of the 275 cfs minimum base flow, the 1,200 cfs mid-October immigration flow, or the flow required to maintain stream water temperatures of 13 °C or less** from the LaGrange Powerhouse (RM 52) to Robert's Ferry Bridge (RM 40).

Monitoring: Spawning surveys, fish health assessments, carcass surveys, instream flow evaluation of spawning habitat, continuous, 'real-time' temperature monitoring at locations spaced from the LaGrange Powerhouse downstream to Waterford, and refinement of a temperature model to predict release flow targets to meet the temperature requirement.

Element #4: Winter flow releases to improve the migration habitat for adult steelhead, and to inundate floodplain habitats to promote the survival, growth, and development (rearing) of juvenile fall-run Chinook salmon and steelhead.

Action: Release 3,000 cfs between February 1 and March 15, with the frequency and duration of the releases defined by WY type as follows:

- Critical and Dry WYs: A single, 2-day release in late Feb.
- Below Normal and Above Normal WYs: A single, 14-day continuous release, or two continuous 7-day releases, one in Feb. and one in March;
- Wet WY: Releases in any multiples of continuous 7-day releases adding to 21 days.

Monitoring: Seining, rotary screw trapping, tagging, tracking, fish health assessments.

Element #5: Spring flow releases to improve the migration habitat for adult steelhead, and improve thermal conditions to promote rearing and downstream migrations of juvenile fall-run Chinook salmon and steelhead smolts.

Action:

- Critical and Dry WYs: From March 20 through April 20, release the greater of the 275 cfs minimum base flow or the flow required to maintain stream water temperatures of 15 ˚C or less** from the LaGrange Powerhouse (RM 52) to the San Joaquin River confluence (RM 0).

- Below Normal WY: From March 20 through April 30, release the greater of the 275 cfs minimum base flow or the flow required to maintain stream water temperatures of 15 °C or less** from the LaGrange Powerhouse (RM 52) to the San Joaquin River confluence (RM 0).
- Above Normal and Wet WYs: From March 20 through May 15, release the greater of the 275 cfs minimum base flow or the flow required to maintain stream water temperatures of 15 °C or less** from the LaGrange Powerhouse (RM 52) to the San Joaquin River confluence (RM 0).

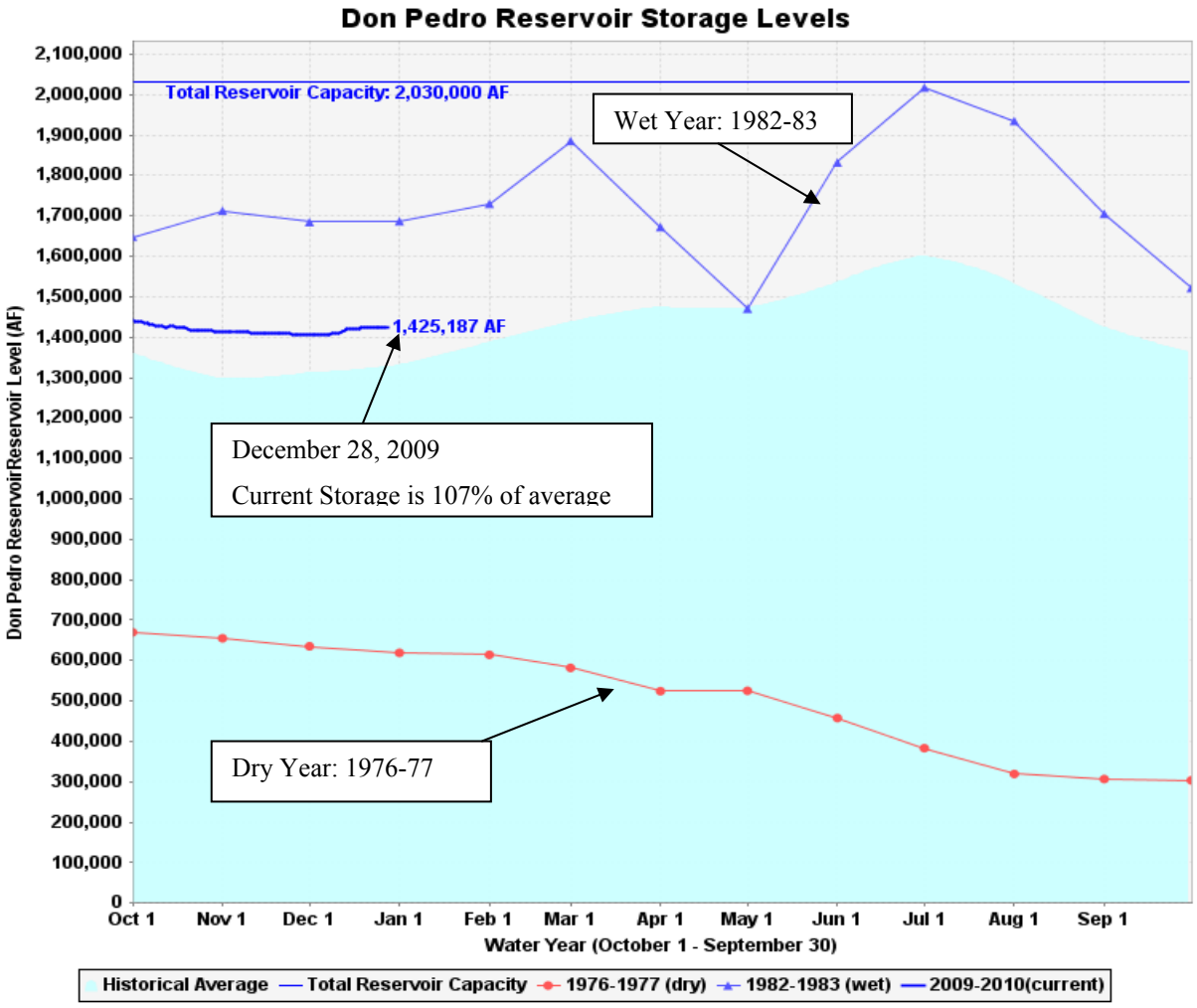
Monitoring: Rotary screw trapping, fish health assessments, radio/pit tagging, continuous, instantaneous 'real-time' temperature monitoring at locations spaced from the LaGrange Powerhouse downstream to the San Joaquin River confluence (RM 0), and refinement of a temperature model to predict release flow targets to meet the temperature requirement.

* Water year classifications are based on the San Joaquin Basin 60-20-20 Index, and the California Department of Water Resources' San Joaquin Valley unimpaired runoff forecasts.

**United States Environmental Protection Agency (USEPA). 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. 49 pp.

Appendix B:

Don Pedro Reservoir Storage Levels
Comparison of Current Storage with Historical Wet and Dry Years



Source: California Department of Water Resources, California Data Exchange Center

DWR-CDEC Internet website:

file:///Z:/References%20&%20Tech%20Papers/Drought-water%20usage/Don%20Pedro%20conditions_Dec28,2009.htm

Appendix C:

We Are Not Alone – Water Scarcity a Worldwide Problem

Rising water demands and scarcity are a worldwide problem—not simply a California one. Regions in Europe's Mediterranean basin and Australia are among the world areas suffering from irregular water supply and rising water demands.

CALFED Lead Scientist Cliff Dahm recently traveled to Girona, Spain, where experts from around the world gathered to share their views and to suggest strategies at a conference titled "Water Scarcity and Management under Mediterranean Climate."

Mediterranean climates, such as we have in much of California, present significant water resource challenges worldwide, Dahm said. People living in Mediterranean climates wrestle with the reality of providing water for human use and protecting valuable aquatic ecosystems. Conservation, new water supplies from wastewater reuse and desalinization, as well as groundwater usage, play key and increasing roles in maintaining water availability during dry periods.

Worldwide, Mediterranean climates are defined by cool, wet winters and warm, dry summers. These climates have a distinctive dry period — often punctuated by drought — when water demand for agriculture and urban areas is high. As a result, surface storage of water from wetter periods for later use (reservoirs), use of groundwater, and use of alternative water supplies, such as treated wastewater and desalinization of brackish water or sea water, are necessary.

Mediterranean climate areas also have a dry season that coincides with the potential highest water demand by humans, animals and crops. Population and economic growth may severely strain water managers' ability to meet future water demand in these areas.

Richer countries with Mediterranean climates, such as those in Europe, Australia, and the U.S., invest in the infrastructure (dams, groundwater wells, water transfer systems, wastewater treatments, and desalinization) to meet their water needs. Yet even these expensive systems can be overwhelmed in times of serious drought, Dahm said. As populations grow and serious droughts occur, more expensive technologies like wastewater reuse and desalinization are being increasingly looked to as solutions. The wealthier countries also are looking to power these alternative water producing technologies with renewable energy supplies. Energy and water supply are intimately linked in all these countries with Mediterranean climates.

One suggestion from the conference was for the need for flexible water quality standards during drought. High levels of nitrate, ammonium and phosphate during periods of drought are found to increase algal blooms and alter food webs downstream of wastewater treatment plants. Water quality standards should be more stringent during drought in Mediterranean climates.

At the conference, Dahm shared his experience working in other parts of the world on complicated water issues similar to those facing the Mediterranean and Australia. In the latter, he said that after a seven-year drought that brought reservoirs down to 15 percent capacity in Southeast Queensland, water restrictions reduced individual use from 106 gallons per person per day, to 37 gallons per person per day. Restrictions applied to pools, lawns, landscaping and other urban use. Inside their homes, for instance, residents learned to take four-minute showers, and to use unused ice cubes and buckets of graywater (wastewater) from showers to water plants. **Queensland's present goal is to target per capita water usage to 45 gallons a day. This compares to average daily per capita water use in the U.S. of between 100-150 gallons and in California of more than 230 gallons. California's 20 percent reduction by the 2020 target date would amount to approximately 185 gallons a day.** (See sidebar for a breakdown of water usage per person per day in California in a sampling of counties.)

Appendix C: continued

Water Use Per Person Per Day in California by County in 2000

A breakdown of water usage in gallons per person per day(GPD) in California in the year 2000, by a sampling of counties shows a wide range:

San Francisco County	108 GPD
Santa Cruz County	121 GPD
Sonoma County	161 GPD
San Diego County	184 GPD
Orange County	190 GPD
Sacramento County	261 GPD
Riverside County	294 GPD
Yolo County	299 GPD
Stanislaus County	321 GPD
Mono County	471 GPD

These figures, taken from a sacbee.com interactive map of water use per capita in California, show water usage from public water supply, minus use for industry and irrigation, divided by the population taking public water.

http://www.sacbee.com/1098/ story/1431106.html

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Appendix D:

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Calculation of the Projected Economics and Jobs Impact of Salmon Recovery in California.
06/24/2009

This analysis uses best available data to develop estimates of the economic impacts from salmon fisheries in recent years. Using assumptions that may or may not hold over time, the potential impacts from a restored fishery matching runs seen from decades past are provided for discussion purposes.

Commercial industry economics and jobs
Data Source: Fisheries of the United States, 2006. Economic and Sociocultural Analysis Division, National Marine Fisheries Service, NOAA, Silver Spring, MD.

Total landings of finfish, shellfish and other in 2006 was $129.9 million. Including processors, dealers, wholesalers, distributors and retail, the economic impacts of all commercial fisheries in the State of California were:

Sales impacts (total sales that occur in the CA economy): $9.753 billion
Income impacts (salaries/wages/benefits, sole proprietor earnings): $5.070 billion
Employment (full and part time): 179,000

To estimate the potential impacts from a restored salmon fishery, average landings for 2004 and 2005 are used as they represent rather steady harvests, with drops beginning in 2006 down to practically nothing in 2008. In 2004 and 2005, salmon on average represented 12% of the total value of California's commercial fisheries landings. Assuming the mark-ups and value added from salmon processing, retail, etc is the same as for all other commercial fisheries in California, then the economic impacts for commercial salmon harvests – if they were at 'normal' 2004 and 2005 levels would have been:

Sales impacts (total sales that occur in the CA economy): $1.17 billion
Income impacts (salaries/wages/benefits, sole proprietor earnings): $608 million
Employment (full and part time): 21,480

Looking back, the average salmon landings for 2004 and 2005 (6,056,000 lbs) are well under historic landings. If salmon can be re-established to historic levels, annual

commercial harvests could reach 25 million pounds. At such levels, assuming no change in the economic impacts per pound of fish landed from current levels, economic impacts from commercial salmon landings could reach:

Sales impacts (total sales that occur in the CA economy): $4.83 billion
Income impacts (salaries/wages/benefits, sole proprietor earnings): $2.51 billion
Employment (full and part time): 88,672

Recreational economics and jobs

Data Source: Fisheries of the United States, 2006. Economic and Sociocultural Analysis Division, National Marine Fisheries Service, NOAA, Silver Spring, MD. Page 33.

California Recreational Fisheries Survey (CRFS). Accessed from http://www.recfin.org/forms/est2004.html. California Department of Fish and Game (DFG) and the Pacific States Marine Fisheries Council (PSMFC).

According to data from the National Marine Fisheries Service, 1,480,000 fishing trips occurred by boat (party, charter and private boats) in 2006. The economic impacts from these trips were:

Total sales impacts (total sales that occur in the CA economy): $1.382 billion
Value-added impacts (salaries/wages/benefits, proprietors & property income, dividends, excise & sales taxes): $723.1 million
Employment (full and part time): 9,076

According to CRFS, in 2004 and 2005, 14.82% of California's marine boat fishing trips targeted salmon. Assuming the economic impacts per trip are consistent regardless of species targeted, the economic impacts associated with salmon trips would have been expected to average approximately:

Total sales impacts (total sales that occur in the CA economy): $204.8 million
Value-added impacts (salaries/wages/benefits, proprietors & property income, dividends, excise & sales taxes): $107.2 million
Employment (full and part time): 1,345

Just like the commercial fisheries analysis presented earlier, the recreational analysis is based on 2004-2006 data. A healthy, well-managed fishery is projected by some to allow for 25 million pounds in annual commercial salmon harvests, which is 4.13 times larger than the actual 2004-2005 average harvest. If recreational fisheries could

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increase by the same amount, and assuming the impacts for the additional trips remain consistent, the economic impacts could reach up to:

Total sales impacts (total sales that occur in the CA economy): $845.8 million
Value-added impacts (salaries/wages/benefits, proprietors & property income, dividends, excise & sales taxes): $442.7 million
Employment (full and part time): 5,555

Total Economics to California's Economy

Based on 2004-2005 levels:

	Sales Impacts	Jobs Impacts:
Commercial	$ 1.170 billion	21,480
Recreational	$ 205 million	1,345
Total	$1.375 billion	22,825

If historical salmon harvests could be reached:

	Sales Impacts	Jobs Impacts:
Commercial	$ 4.830 billion	88,672
Recreational	$ 846 million	5,555
Total	$5.676 billion	94,227

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