



## FOOTHILLS WATER NETWORK

Via Electronic Submittal

Hon. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

**COMMENTS ON DRAFT LICENSE APPLICATIONS FOR  
DRUM-SPAULDING PROJECT # 2310 AND  
YUBA-BEAR PROJECT # 2266**

February 1, 2011

Dear Secretary Bose:

The Foothills Water Network submits these Comments on the Draft License Application for Pacific Gas & Electric's (PG&E) Drum-Spaulding Hydropower Project and Nevada Irrigation District's (NID) Yuba-Bear Hydropower Project as filed on November 3, 2010.<sup>1</sup>

With the exception of comments on specific stream reaches for which Licensees are individually responsible, all comments are addressed to both Licensees.

**Foothills Water Network**

This response was jointly developed and signed by non-governmental organizations and individuals participating in the Drum-Spaulding and Yuba-Bear Relicensings. The Foothills Water Network represents a broad group of non-governmental organizations and water resource stakeholders in the Yuba, Bear, and American Watersheds. The overall goal of the Foothills Water Network is to provide a forum that increases the effectiveness of non-profit conservation organizations to achieve river and watershed restoration and protection benefits for the Yuba, Bear, and American Rivers. This includes negotiations at the county, state, and federal levels, with an immediate focus on the FERC relicensing processes.

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<sup>1</sup> PG&E Drum-Spaulding Draft License Application Accession #20101103-5052 and NID's Yuba-Bear Draft License Application Accession #20101108-0035

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# 1 Priority Changes and Additions for Final License Application

We recommend that PG&E and NID's Final License Applications (FLA's) be revised to include additional data and address the following:

- 1) Data that are sufficient for the Commission's preparation of a robust environmental document as required under the National Environmental Policy Act, so that the public can be fully informed as to the potential impacts of and alternatives to the proposed projects;
- 2) Data and analysis that are sufficient to support a finding by the Commission under FPA section 10(a) that the new license is best suited for a comprehensive plan of development for the river and represents an optimal balance between hydropower generation, water supply and reintroduction of anadromous fish;
- 3) A No-Action Alternative that represents existing conditions;
- 4) A (baseline case) for the hydrologic model that represents existing conditions;
- 5) Flow measures that are developed using water temperature criteria and, where appropriate, a spring snowmelt recession coming off spill events;
- 6) A Recreation Plan with measures that enhance public access, angling, whitewater boating, swimming and water play along specific river reaches;
- 7) Measures for Riparian and Sediment Management;
- 8) Flow and non-flow measures consistent with enhancement of recreation opportunities, particularly for whitewater boating and angling;
- 9) Non-Flow Measures to enhance the Bear Valley and the Bear River below Chicago Park Powerhouse; and
- 10) Measures to protect and enhance culturally significant Native American sites and heritage.

Our comments discuss these priority topics in more detail below.

## 1.1 Comprehensive Planning under the Federal Power Act

Under section 10(a)(1) of the Federal Power Act (FPA) the Commission must make a finding that each new license will be in the public interest and best suited to a comprehensive plan of development for the river:

That the project adopted, including the maps, plans, and specifications, 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....

16 U.S.C. § 803(a)(1). Thus, “the Commission must, under the FPA, consider all facts relevant to the public interest in developing a comprehensive plan [...] This consideration necessarily includes a comprehensive analysis of the water system of which the Project is a part, and the interdependent impact of the Project on other projects in the region.” *LaFlamme v. FERC*, 945 F.2d 1124, 1128 (9th Cir. 1991).

Ninety years ago, the Federal Power Commission recognized that in order to comply with the FPA it would need to examine the interaction of all uses of a river prior to issuing a license for a specific project:

On several streams the power developments proposed are so involved with other uses, particularly with irrigation and navigation, that if the Commission is to comply with the requirements of the act as quoted [section 10(a)], it must make, or cause to be made, careful studies of the streams, and must have a consistent scheme of development outlined before any permits or licenses are issued. This is particularly true of the St. Lawrence, the Columbia, the Deschutes, and the Colorado Rivers. It is likely to prove true of the Kings and certain other streams in California.

(Federal Power Commission, *First Annual Report of the Federal Power Commission, Fiscal Year Ended 1921*. p. 30).<sup>2</sup>

In 1965, the 9th Circuit, in upholding license requirements for the New Don Pedro Project (FERC No. 2299), affirmed not only the need to study and analyze the interaction of power production with other uses on a waterway, but also, citing to FPA section 10(a), affirmed the authority of the Commission to impair full use of water rights for irrigation purposes in favor of other beneficial uses:

The districts contend that Article 37 impairs the irrigation uses of the districts covered by water rights acquired under California law, and that the Commission is without authority to impair those rights. ... In granting such a license the Commission is required, under section 10(a) of the Federal Power Act, 49 Stat. 842 (1935), as amended 16 U.S.C. § 803(a) (1962), to consider all beneficial public uses including recreational uses. Under that section, and under section 4(g)

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<http://books.google.com/books?id=7rwXAAAAYAAJ&dq=annual%20report%20federal%20power%20commission&pg=PA30#v=onepage&q=deschutes&f=false>

of the Act, 16 U.S.C. § 797(g) (1958), the Commission is made the ‘guardian of the public domain.’ *F.P.C. v. Idaho Power Co.*, 344 U.S. 17, 23, 73 S.Ct. 85, 97 L.Ed. 15. We therefore conclude that the Commission had authority to incorporate in the tendered license a condition which could operate to impair the districts' full use of their irrigation water rights in some future year. ... Should such an eventuality come to pass, any such Commission action will be subject to review as to the sufficiency of the evidence to support findings upon which such action is based, and as to whether the action is arbitrary and capricious. But we now hold that the Commission has the legal authority to take appropriate action restricting the use of such irrigation rights, should the occasion arise.

*State of California v. Federal Power Commission No. 19394*, 59 P.U.R.3d. 175, 345 F.2d.917, (1965).

While it is the Commission’s obligation to comply with Section 10(a)(1), and it has independent powers of investigation for purposes of compliance (*see Scenic Hudson Preservation Conference v. Federal Power Commission*, 354 F. 2d 608 (2d Cir. 1965))<sup>3</sup>, the Commission necessarily relies on the license applicants to provide much of the record on which its Section 10(a)(1) finding is based. The Commission has adopted required contents for license applications and regulations and guidance for studies to assure the license applicant can furnish adequate information in support of a new license. For example, FERC’s *Handbook for Hydroelectric Project Licensing and 5 MW Exemptions from Licensing* (April, 2004) gives a framework for developing and conducting studies to inform and enable study participants to focus on issues important to the development of license conditions and environmental assessment. In particular, this guidance, highlighted in the original, states: “[t]he applicant’s study program should enable all the participants in the licensing process to focus on the relationships between environmental resources, power production, flood control, irrigation, and other potential uses of the waterway.”<sup>4</sup>

Based on our review of the DLA’s, we do not think that they provide adequate information for the Commission to meet the comprehensive development standard. They fail to provide sufficient information and detail about current and future consumptive use of the water that is delivered by the projects to water purveyors; those purveyors are licensee Nevada Irrigation District itself and Placer County Water Agency (PCWA). They fail to describe the importance of the contractual relationship between PG&E and PCWA, and the changes in water use that may occur when the contract for most of the water delivered from PG&E to PCWA expires in 2013 and is renegotiated. They fail to analyze recurring water transfers of water that passes through the Yuba-Bear and Drum-Spaulding system, and the potential impacts of reducing these transfers in the future. And they fail to analyze the significance of potential reductions in the amount of water available to water purveyors should flows in project-affected stream reaches be increased.

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<sup>3</sup> “The Commission must see to it that the record is complete. The Commission has an affirmative duty to inquire into and consider all relevant facts.”

<sup>4</sup> *Handbook for Hydroelectric Project Licensing and 5 MW Exemptions from Licensing* (April, 2004). P. 3-9, Available at: [http://www.ferc.gov/industries/hydropower/gen-info/handbooks/licensing\\_handbook.pdf](http://www.ferc.gov/industries/hydropower/gen-info/handbooks/licensing_handbook.pdf)

The DLA's are inadequate because they do not describe the relationship between proposed license conditions and the reintroduction of salmon and steelhead to project-affected stream reaches. The DLA's do not describe the dependence of such future reintroduction on habitat and flow conditions in project-affected stream reaches, and whose feasibility requires license conditions that provide those conditions. The DLA's do not describe the interaction between projects and other water use facilities in the watershed, notably the Yuba River Development Project and Army Corps facilities at Englebright and Daguerre dams.

We address these issues more fully below.

### **1.2 Two Licenses, One Operation**

FERC will issue separate licenses for the Yuba-Bear and Drum Spaulding projects. However, each license must address the fact that the projects are interconnected and operated in close coordination. Based on our review, the draft license applications do not account for the interconnectedness of the projects and their collective impacts on the river system. Plainly, if the projects may be operated in coordination to meet water supply demands and maximize hydropower revenue, they can also be operated in coordination to enhance non-developmental uses of the river such as fish and wildlife and recreation.

The administrative and license separation of the projects, yet functional coordinated operations, present a number of questions of responsibility for mitigations and enhancements. In many cases, one Licensee's operating objectives for a downstream reach should drive the operating objectives for the reach upstream operated by the other Licensee. The FLA's should include measures that reflect this kind of coordinated comprehensive watershed planning.

### **1.3 Operations of the Project for Water Supply**

Nevada Irrigation District operates the Yuba-Bear Project to generate power with water that is managed principally for water supply. Pacific Gas & Electric Company delivers large amounts of consumptive water from the Drum-Spaulding Project to Placer County Water Agency. The Licensees' commitments to deliver water vary seasonally, and substantial amounts of water are also used by the projects exclusively for power generation, and not delivered locally for water supply purposes. However, regardless of the seasonal variations, water supply delivery is a principal objective and operating principle of the Yuba-Bear and Drum-Spaulding projects. Balancing water supply uses with other uses of project-affected waterways, including ecosystem protection, mitigation, and enhancement, must be part of the balancing of uses of the affected waterways that is considered in this coordinated relicensing under the comprehensive planning requirements of Section 10(a) of the Federal Power Act.

## **1.4 Reintroduction of Anadromous Fish to the South Yuba River and the Middle Yuba River**

As stated in Section 2.4 and 2.5 of these comments, the projects have cumulative impacts on fish passage. The DLA's do not adequately address the potential for reintroduction of these species. However, we believe the FLA's should address this potential in light of other foreseeable actions in the watershed that could lead to passage into the Yuba River during the term of the new license. As discussed above, the comprehensive planning standard established by FPA section 10(a)(1) requires that the Commission evaluate the new licenses in light of all related uses of and activities on the river.

Resource agencies and Network members are confronted with a Catch-22 created by the timing of the Yuba-Bear and Drum-Spaulling relicensing on the one hand, and the Yuba River Development relicensing on the other hand. That is, reintroduction of anadromous fish to the river reaches directly affected by the Yuba-Bear and Drum-Spaulling projects requires habitat conditions suitable for anadromous fish, but habitat conditions for anadromous fish have up till now been excluded from consideration by the licensees in the YBDS relicensings on the grounds that anadromous fish have not yet been reintroduced into the waters immediately downstream of YBDS project facilities. Fish passage issues, which will facilitate fish migration into the YBDS-affected reaches, are being addressed through different processes, potentially including the Yuba River Development relicensing. However, the Yuba River Development relicensing is not timed to coincide with the YBDS relicensing. In short, since anadromous fish have not yet been reintroduced into waters directly affected by the Yuba-Bear and Drum-Spaulling projects, habitat enhancement for such fish has been taken off the table in this relicensing. However, if sufficient flow is not provided in the coordinated YBDS process, this would appear to decrease the need to provide passage for anadromous fish, through another proceeding, into YBDS-affected waters.

The FLA's should consider salmon and steelhead as target species in the South Yuba River, the Middle Yuba River, and Auburn Ravine. They should evaluate and include flows adequate for migration, holding, spawning, and juvenile rearing for these species in these waters, and should include other habitat and management conditions needed to support reintroduction.

## **2 NEPA Alternatives**

Given the potentially significant environmental impacts, we believe the Commission must prepare an Environmental Impact Statement (EIS) that covers the two projects. *See* 42 U.S.C. § 4332(C). While ultimately it is the Commission's responsibility to comply with NEPA, Commission Staff rely on license applicants to provide much of the data on which Staff's environmental analysis is based. The Commission's regulations implementing NEPA require that the license applicant "[p]rovide all necessary or relevant information to the Commission," and "[c]onduct any studies that the Commission staff considers necessary or relevant to determine the impact of the proposal on the human environment and natural resources." 18 C.F.R. § 380.3(b)(1)-(2). The regulations describing application content specify that the license

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application include information regarding cumulative effects (*see* 18 C.F.R. § 5.18(b)(2)); compliance with applicable laws such as Section 401 of the Clean Water Act, Endangered Species Act, and the National Historic Preservation Act (*see id.* at § 5.18(b)(3)); the proposed action and action alternatives and their effects on the environment as indicated by studies, including any unavoidable adverse effects and any environmental measures to mitigate effects (*see id.* at § 5.18(b)(5)).

The Commission must assure that the information contained in the license application is adequate for its analysis of cumulative impacts. NEPA requires analysis of the cumulative impacts of a proposed action in conjunction with all past, present, and reasonably foreseeable future actions. *See* 40 C.F.R. §§ 1508.7, 1508.27(b)(7); *Kern v. U.S. Bureau of Land Management*, 284 F.3d at 1075-76; *Idaho Sporting Congress v. Rittenhouse*, 305 F.3d 957, 973 (9<sup>th</sup> Cir. 2002). Cumulative impacts help determine the overall significance of the impacts of the proposed action. *See* 40 C.F.R. § 1508(b)(7). “Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.” *Id.* We believe that the new licenses in conjunction with present water supply operations will cumulatively affect fish and wildlife and recreation resources.

The Commission must assure that the information contained in the license application is adequate for analysis of a reasonable range of alternatives. NEPA expressly requires that a NEPA document consider a reasonable range of alternatives to the proposed action which would achieve a given purpose. *See* 42 U.S.C. § 4332(2)(E); 40 C.F.R. § 1508.9(b), *Bob Marshall Alliance*, 852 F.2d at 1229; *Native Ecosystem Council v. U.S. Forest Service*, 428 F.3d 1233, 1245-46 (9<sup>th</sup> Cir. 2005).

[40 C.F.R.] section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant....

Council on Environmental Quality, “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulation,” 46 Fed. Reg. 18,026 (Mar. 23, 1981), Answers 2a. As stated above, the new licenses in conjunction with water supply operations cumulatively impact fish and wildlife and recreation. Thus, as discussed in more detail below, it is appropriate for the Commission to consider reasonable alternatives involving changes in water supply operations which are under the control of the licensees, for the purpose of mitigating cumulative impacts of power and water supply operations. The draft license applications presently do not provide adequate information for the Commission and other parties to develop such alternatives. The Commission must also consider reasonable alternatives that address the reintroduction of salmon and steelhead to the Middle Yuba River and the South Yuba River. While these fish are presently are prevented from gaining access to these rivers by non-projects dams, their reintroduction is foreseeable during the term of the new license. (See Section 2.4 of these comments for reasonable and foreseeable rationale for anadromous fish reintroduction.)

The Licensees' FLA should include 1) a No-Action Alternative representing existing conditions; 2) a Future Water Demand Growth Alternative, which includes various future water demand for NID and PCWA, including projected build-out and also reduced water demand based on changes to the about-to-expire water delivery contract between PG&E and Placer County Water Agency; and 3) an Anadromous Fish Reintroduction Alternative that evaluates the consequences of reintroduction of salmon and steelhead to the South Yuba River, to the Middle Yuba River, and to both the South Yuba River and the Middle Yuba River. 4) Cumulative Effects on Lower American River.

## **2.1 No-Action Alternative and Baseline**

PG&E and NID's Draft License Application Section 6.3 show that the licensees have made assumptions about future water supply demands and included them in the Base Case No-Action Alternative. This is inappropriate under NEPA and CEQA. The PG&E and NID FLA should include as the No-Action Alternative (base case) existing operations with recent historic water supply deliveries.

### **NEPA**

It is well established that the NEPA baseline is "existing conditions," sometimes called "current conditions." *See* ILP Rulemaking, 68 FR 51070-01, Para. 88; n.86. The PG&E and NID FLA should not include the Water Delivery Demand Growth in the Base Case No-Action Alternative, because that scenario does not represent existing conditions.

By definition, future water deliveries that go beyond current historical levels have not happened yet. Therefore by definition they cannot be part of existing conditions.

There is also a practical problem with including expanded future water deliveries in the baseline: they are purely speculative. Since they have not happened yet, projections are uncertain and subject to dispute. If we are required to speculate about future trends to prepare a baseline, then we are doing something wrong.

Although FERC does sometimes state in its NEPA documents that "No Action" is tantamount to continuing indefinitely under present license conditions (*see American Rivers v. FERC*, 201 F.3d 1186 (9th Cir. 2000)), there is nothing in the caselaw that compels FERC to speculate about future conditions to establish a baseline. *American Rivers v. FERC* and similar cases focused on whether existing physical structures were part of the baseline, and did not consider the question here.

In addition, we are not aware of any case law where FERC has explained its apparent conclusion that the Baseline and the No Action Alternative are one and the same.

### **CEQA**

The law under CEQA, the California Environmental Quality Act is even more straightforward. The baseline is existing conditions. The CEQA Guidelines state that the...

...EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published .... This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. Cal. Code Regs. Tit. 14, § 15125 (a).

There is no doubt under California law that future growth cannot be included in a baseline even if it is allowed by present regulation. The issue was recently addressed by the California Supreme Court in *Communities for a Better Environment v. South Coast Air Quality Management District*, 48 Cal 4th 310 (2010). The Court framed the issue where a plan or regulation allowed for greater development or more intense activity than had so far actually occurred ....” *Id.* at 321. The Court reaffirmed what each appellate court in similar decisions had concluded, which is that the baseline for CEQA must be the “existing physical conditions in the affected area’ (cite) or the ‘real conditions on the ground’ (cite) rather than the level of development or activity that could or should have been present according to plan or regulation.” *Id.* at 321. A second recent case is also on point. *See Sunnyvale West Neighborhood Assn. v. City of Sunnyvale City Council* \_\_Cal.App.4th \_\_[No. H035135. Sixth Dist. Dec. 16, 2010] (holding that projections for future growth cannot be included in the baseline, which must be existing physical conditions on the ground).

Although FERC may be more concerned in the FLA with NEPA requirements, CEQA requirements could not be clearer. If PG&E and NID continue to include Water Delivery Demand Growth in their base case in their FLA’s, the Licensees will have to redo the base case and analyses to meet CEQA requirements. To conduct two different analyses under NEPA and CEQA would double the amount of work, is redundant and costly. If Licensees cannot incorporate their analysis under NEPA into CEQA, Licensees are unnecessarily delaying the relicensing process and no will be able to claim surprise when the State Water Board insists on a new analysis in order to complete its Clean Water Act section 401 certification.

PCWA and relicensing stakeholders adopted a good approach to a comparable issue in the Middle Fork American Relicensing. PCWA modeled the base case as existing conditions and modeled a scenario called ‘Base Case + Buildout’, which included project future waters delivery demand growth.

## **2.2 Coordinated Operations Alternative to Enhance All Beneficial Uses**

Under existing conditions, operation of the Yuba-Bear and Drum-Spaulding Projects are coordinated to meet water supply demand, and to optimize power production benefits while also meeting that water supply demand. In its NEPA analysis, FERC should include a Coordinated Operations Alternative that applies the same principle of coordinated project operation to other beneficial uses such as fisheries enhancement and re-creation of the snowmelt hydrograph in key stream reaches. If the environmental analysis shows that such an alternative is feasible and would contribute to enhancement of beneficial uses, then FERC can consider equitable trade-offs

that might be required should the burden of achieving the most suitable comprehensive plan for the waterway fall disproportionately on one of the licensees.

The alternative should also consider opportunities for coordinated management that would benefit project-affected environmental resources. Such management should consider coordination not only between licensees, but also with resource agencies and NGO stakeholders.<sup>5</sup> The complexity of the coordinated projects, and the diversity of interests and stakeholders that they affect, suggests that an ecological resources committee such as those that exist to assist in managing several other nearby projects would be an excellent vehicle to execute comprehensive planning.

### **2.3 Future Water Demand Alternative**

As stated above with regard to the No-Action Alternative, the baseline is existing conditions. However, the relicensing participants understand that future water demand is one of the major interests in the relicensing. Therefore, it is imperative that the Licensees develop a Future Water Demand Alternative that represents potential decreases and increases in future water demand for NID and PCWA.

The Licensee's FLA's should include a Future Water Demand Alternative that reflects existing operations with various scenarios for future predicted water supply deliveries. The alternative should evaluate potential increased water supply deliveries based on PCWA's and NID's future water demand growth projections, as stated in the January 20, 2011 spreadsheet.

The Future Water Demand Alternative should also evaluate potential future decreases in demand due to the price elasticity of raw water, future water conservation efforts and regulations, and elimination of water sales by NID to South Sutter Water District.

Foothills Water Network recommends that scenarios for reduced water supply demand be developed. We recommend that four reduced demand scenarios be evaluated:

1) Demand reduction in PCWA raw water deliveries by 29,484 acre-feet per year, compared to average water deliveries to PCWA in 2001-2009, not including conveyance losses. If PG&E were to increase its pricing of water sold to Placer County Water Agency by enough to recover the cost of power lost by such sale, Foothills Water Network calculates that the raw water cost to PCWA customers would increase by \$24.05/af. Using a standard calculator for demand reduction based on Appendix A to these comments, we calculate a likely raw water demand reduction of 29,484 acre-feet per year with such a cost increase.<sup>6</sup>

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<sup>5</sup> An alternative should not be deemed unreasonable on the sole basis that it is outside the sole jurisdiction of the lead agency or less preferable from the license applicant's point of view. See 40 C.F.R. § 1502.14(c).

<sup>6</sup> The Foothills Water Network has submitted to PG&E and NID an exploratory model run based on price elasticity of future water demand growth (see Appendix B) as described in Price Elasticity Reconsidered (see Appendix C).

2) Demand reduction in NID raw water deliveries of 14,476 acre-feet per year, compared to average water deliveries to NID in 2001-2009, not including conveyance losses. This assumes a modest 10% reduction in overall NID deliveries, based on proposed conservation measures, reduction of canal losses, institution of Best Management Practices district-wide, and other measures.

3) Demand reduction of both 29,484 acre-feet per year, compared to average water deliveries to PCWA in 2001-2009 and 14,476 acre-feet per year, compared to average water deliveries to NID, in 2001-2009.

4) Elimination of water sales by Nevada Irrigation District to South Sutter Water District.

Please refer to Section 3 of these comments for additional detail regarding water supply issues.

## **2.4 Anadromous Fish Reintroduction Alternative**

One of our overriding interests in the Yuba-Bear and Drum-Spaulding relicensings is in increasing habitat for spring-run Chinook salmon and steelhead in the South Yuba River and the Middle Yuba River. We recommend that the FLAs consider the following alternatives for Salmon and steelhead Reintroduction 1) instream flows in both the Middle Yuba River and South Yuba River for spring-run Chinook and steelhead habitat; 2) instream flows for spring-run Chinook and steelhead in the Middle Yuba River only; and 3) instream flows for spring-run Chinook and steelhead in the South Yuba River only.

These flow alternatives should be based on temperature thresholds as well as wetted perimeter that provide a reasonable likelihood for all life stages of anadromous fish to survive in all water year types. The alternative should place particular emphasis on flows that provide upstream and downstream migration, spawning, holding, and juvenile rearing.

In addition, the Commission should analyze other habitat requirements for reintroduced anadromous fish that may be affected by operation of the projects, and for which mitigations or enhancements in the relicensing process may be feasible.

It is reasonable and foreseeable that Chinook salmon and steelhead will be reintroduced to project-affected stream reaches in the South Yuba and Middle Yuba rivers. The licensees' DLA's include one of the reasonable and foreseeable actions below – the NMFS hosted "Multi-party Forum" or Yuba Salmon Forum. The licensees' FLA's should include an alternative that evaluates reintroduction of Chinook salmon and steelhead as reasonable and foreseeable. Our request is based on the following:

- Fish passage at Englebright Reservoir will be addressed in the relicensing of Yuba County Water Agency's Yuba River Development Project. Foothills Water Network will argue in forthcoming comments on YCWA's Pre-Application Document that fish passage at Englebright is the responsibility of YCWA, which uses Englebright reservoir as an afterbay for one powerhouse and a forebay for a second powerhouse. Similarly, fish

passage will be an issue in the relicensing of PG&E's Narrows Project, P-1403, which is scheduled to occur during the license terms for Yuba Bear and Drum Spaulding.

- In recent years, a series of judicial rulings from the Federal Courts has overturned Biological Opinions issued by the National Marine Fisheries Service on the basis of inadequate consideration of actions to protect or recover listed salmonids. In response to an ongoing ESA lawsuit by the South Yuba River Citizens League and Friends of the River, Ninth District Court Judge Lawrence Karlton in November 2010 remanded the Biological Opinion for United States Army Corps of Engineers' (USACE) Englebright and Daguerre Dams on the lower Yuba River with instructions for a variety of new considerations, including fish passage at Englebright Reservoir.
- The National Marine Fisheries Service recently produced a report on fish passage at Englebright Reservoir, (see *Yuba River Fish Passage: Conceptual Engineering Project Options* February 2010), which analyzes several fish passage options for Englebright Reservoir. NMFS also currently has Stillwater Sciences under contract to conduct an evaluation of anadromous fish habitat in the upper Yuba watershed using RIPPLE modeling software.
- NMFS's Public Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of Central Valley Steelhead (October, 2009) lists presents the upper Yuba River watershed as a "Priority Area for Reintroduction" of spring-run Chinook salmon.<sup>7</sup> As stated in the Plan, "The upper Yuba River has long been recognized for offering perhaps the best opportunity to create a viable population in the Northern Sierra Diversity Group, that is wholly separate from other populations and many of the catastrophic risk factors other populations face. Several initiatives are underway to develop engineering alternatives to allow upstream passage, develop reintroduction plans, and collaborate with watershed stakeholders to develop a reintroduction strategy."<sup>8</sup>
- Multi-party forum discussions centering on the Yuba Basin in connection with fish passage (which includes NGOs and federal and state agencies, including water agencies and FERC). It is unclear how or when such discussions will be concluded or whether those discussions' outcome will have any effect on these projects.<sup>9</sup>
- The Middle and South Yuba Rivers were considered by NMFS during their most recent "critical habitat" assessment for endangered anadromous fish species, specifically Central Valley Spring-Run Chinook and Steelhead. NMFS deferred a final designation, pending

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<sup>7</sup> Recovery Strategy Summary, page 18.

<sup>8</sup> *Public Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of Central Valley Steelhead*, NMFS, p. 213.

<sup>9</sup> NID Draft License Application Exhibit E, Section 3, Cumulative Effects - Geographic and Temporal Report, p. E3-3

outputs from the Upper Yuba River Studies Program.. The Program’s Upper Yuba River Watershed Habitat Feasibility Report (2006), states in conclusion of the Executive Summary that “analyzed habitat and temperature conditions in the upper Yuba River watershed are capable of supporting anadromous salmonids.”<sup>10</sup>

- The Upper Yuba River Watershed Habitat Feasibility Report (2006) provides specific evidence that the Middle Yuba River under existing operations could support spawning populations of spring-run and steelhead “comparable to or greater than the historical run size in many years in other Central Valley streams.”<sup>11</sup> The Upper Yuba River Studies Program concludes, “Additional flow released from Milton Reservoir at the top of the Middle Yuba River would increase the linear extent of reaches with suitable water temperatures for spring-run Chinook salmon and steelhead ... Additional flow could also aid in providing passage at the low-flow barriers, increase the amount of rearing habitat, and increase the likelihood that introductions would be successful.”<sup>12</sup>
- The foremost scientific evaluation of the viability of Central Valley Spring-run Chinook Salmon and Steelhead (Lindley et al 2007) has concluded that the risk of extinction for these threatened evolutionary significant unit (ESUs) cannot be reduced without providing access to historical habitats, and cited “restoring access to the Yuba River above Englebright Dam” as a single example for reintroduction.<sup>13</sup>
- The Final Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of Central Valley Steelhead is now scheduled for release in August, 2011, and will certainly be released prior to the issuance of project licenses for the Yuba-Bear and Drum-Spaulding projects. The Recovery Plan will include specific management objectives for restoration and recovery of these listed species.

If FERC does not include Salmon and Steelhead Alternatives in the NEPA document, there is a very high probability that the NEPA document, and ultimately the license, will fail to account fully and accurately for conditions in the watershed during the license term. Indeed, the NEPA document might be overtaken by events before it is even completed. If the NEPA document does not address these issues they likely will still arise in the state certification process, leaving the SWRCB to resolve issues related to flow and passage as necessary to protect the beneficial use of coldwater spawning and habitat. *See* McCloud-Pit Project, P-2106 (anadromous fish reintroduction expected before new license is issued).

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<sup>10</sup> The Upper Yuba River Studies Program, Executive Summary.

<sup>11</sup> The Upper Yuba River Watershed Habitat Feasibility Report (2006), NMFS p. 6-1

<sup>12</sup> The Upper Yuba River Watershed Habitat Feasibility Report (2006), NMFS p. 6-1

<sup>13</sup> Lindley, Steven T. and eleven other authors. 2007. Framework for assessing viability of threatened and endangered Chinook salmon and steelhead in the Sacramento-San Joaquin Basin. San Francisco Estuary and Watershed Science. CAL-FED.

## **2.5 Cumulative Effects Analysis**

The PG&E and NID DLA's Exhibit E, Section 3, Cumulative Effects fails to analyze the cumulative effects of YBDS on the Lower Yuba River and reintroduction of Chinook salmon and steelhead into the upper Yuba River.<sup>14</sup> Further, the DLA's fail to address the YBDS Projects' effects on Folsom Reservoir, its operations, the Lower American River, and its associated salmon population.

PG&E and NID FLA's should include a more robust cumulative effects analysis. The analysis should include but not be limited to effects on anadromous fish in the Lower American River, Folsom Reservoir operations. The analysis should also address cumulative effects on the Lower Yuba and Yuba County Water Agency's Yuba River Development Project.

### **Cumulative Effects on the Middle Fork American and Lower American Rivers**

Because PG&E and NID's operations affect the availability of water from the Yuba-Bear Drum-Spaulding system, we recommend that PG&E and NID's FLA also include an analysis of various reductions of water availability from Yuba-Bear Drum-Spaulding system and the ensuing changes that could be made to the Middle Fork Project to meet PCWA's water supply obligations.

As PG&E and NID states in its DLA, "The Drum-Spaulding Project is currently undergoing FERC relicensing, however, it is unknown at this time, or to what extent, the existing license conditions will change."<sup>15</sup> Therefore, we cannot know at this time what the outcome will be, but for the purposes of the Middle Fork Project Relicensing the NEPA analysis must consider a range of outcomes that include some reduction of water from Yuba-Bear Drum-Spaulding Project's out of basin water transfers. As we have learned in the Yuba-Bear Drum-Spaulding Relicensing, PG&E currently abandons roughly 125,000 acre-feet in Folsom Reservoir. In addition, PG&E and NID's water contracts expire in 2013. The combination of outcomes of the Yuba-Bear Drum-Spaulding relicensing and the renegotiation of contracts could alter PG&E and NID's water supply and, therefore, their Middle Fork Project operations. Therefore, we recommend that PG&E and NID's FLA include an analysis of different levels of reduction of water availability from the Yuba-Bear Drum-Spaulding system. We have suggested alternatives above.

Further, PG&E and NID should address the question of how changed operations resulting from reductions in water available from the Yuba-Bear Drum-Spaulding system could affect temperatures in Folsom Reservoir and the Bureau of Reclamation's flow releases into the Lower American River. The discussion of effects on Folsom and the Lower American River should address effects on temperatures in Folsom Reservoir, volume of cold-water pool in Folsom, and volume of inflow to Folsom upon which rests the development of the Sacramento Water Forum

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<sup>14</sup> YBDS Draft License Application, Exhibit E, Section 3, Cumulative Effects - Geographic and Temporal Report, p. E3- 1-3

<sup>15</sup> PCWA DLA, Exhibit E, Section 9 Cumulative Effects Analysis, 9.2 Cumulative Effects on Water Resources, p. 9-4.

Flow Standard, which will define releases to the Lower American River for salmon and steelhead.

Finally, licensees should analyze the potential cumulative effects on salmon and steelhead in Auburn Ravine and other West Placer creeks that might result from the effects of changes in project operations. Specifically, licensees should analyze the potential effects of changes to Placer County Water Agency water deliveries resulting from changes in the quantity of water available to PCWA from the Yuba-Bear Drum-Spaulding system.

### ***Cumulative Effects on the Lower Yuba***

Together, the Drum-Spaulding and Yuba-Bear Projects export a combined average of over 400,000 acre-feet per year from the Middle and South Yuba watersheds for use in the projects' hydropower system on the Bear River. NID's Yuba-Bear Project alone diverts an average of 60,000 afy from Middle Yuba into the Milton Bowman Tunnel, which conveys the water to Spaulding Reservoir and the Bear River hydropower facilities.

Because of this annual export of water from the Yuba watershed, the Projects result in significant impacts for magnitude, timing, variability, and temperature of water available to the lower Yuba River downstream of Englebright Dam.

The management of flows in the lower Yuba River is based on actual, not unimpaired, inflow to Yuba County Water Agency's New Bullards Bar Reservoir. By reducing that inflow by an average of over 60,000 afy, the NID Yuba-Bear Project (at minimum) directly affects the amount of water that is available to meet instream flow releases below Englebright Reservoir. This diversion qualifies as a direct effect on Lower Yuba flows.

As stated in the Yuba Accord EIR/EIS:

The upper basins of the Middle Yuba and South Yuba rivers have been extensively developed for hydroelectric power generation and consumptive uses by Nevada Irrigation District (NID) and PG&E. Total storage capacity of about 307 TAF on the Middle Yuba and South Yuba rivers and associated diversion facilities enable both NID and PG&E to export an average of approximately 410 TAF per year from the Yuba River Basin to the Bear River and American River basins. ... While these upper basins lie outside of the project study area [for the Yuba Accord], the described operations can significantly reduce the water supply available to the lower Yuba River, particularly during dry and critical water years.

### 3 Water Supply Demand

In response to NMFS and FWN requests for a “Water Usage and Efficiency Study”<sup>16</sup>, Licensee NID responded:

NMFS-15: General Comment. NMFS has not explained why the information in the PAD is not adequate to meet NMFS’ requested study objectives. License is confused by NMFS’s leap from a concern regarding not reducing canal loses that might support ESA-listed anadromous fish to the broad objective of NMFS’ requested study, as NID sees no nexus between the two, Licensee points out that Licensee’s PAD includes daily information for the past 30 years of project operations regarding: 1) diversions/transfers of water into and flows through project conduits; 2) releases from project facilities; and 4) flow through project powerhouses. Licensee’s Water Balance/Operations model also includes estimated evaporations losses in each project facility and water deliveries. No water is consumed in the project.<sup>17</sup>

In its February 23, 2009 Study Plan Determination for the Yuba-Bear, Drum-Spaulding, and Rollins Projects, FERC stated:

...we agree with the applicants that most of the data that would be provided in this study already exists, either contained in the PAD, otherwise provided to the relicensing participants, or otherwise publicly available. We see little utility in some of the requested data collection efforts...<sup>18</sup>

At the time, FERC and the Licensees did not seem to think it was important to study the water supply side of these projects and its relationship to hydropower generation, and impacts on project-affected reaches. However, this changed substantially when a water balance model run requested by Foothills Water Network modeled instream flows that appeared to require a small reduction in water available to Placer County Water Agency in September of some dry years. In response, the Chairman of PCWA’s Board of Directors, on September 16, 2010, wrote a letter to the YBDS licensees and filed it in the dockets of the two projects which stated: “[a]ny loss of access to Yuba river water to [Placer County] citizens would be a serious, and for many, unmitigable hardship.”<sup>19</sup> The letter was also copied to over two dozen entities, including individual public officials, chambers of commerce, and city councils. When raised by a water purveyor, the issue raised by a resource agency and by NGO’s over a year previously quickly became a priority issue in the relicensing.

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<sup>16</sup> NMFS Comment on Proposed Study Plan 20081223-5112, Enclosure B, pp. 29-38 (pdf pagination). Foothills Water Network Comment on Proposed Study Plan 20081224-5011, pp. 22-23.

<sup>17</sup> Nevada Irrigation District’s Revised Study Plans for the Yuba-Bear Hydroelectric Project under P-2266 Accession # 20090123-5109. NID Yuba-Bear Attachment 3, page 326 (pdf pagination).

<sup>18</sup> FERC Study Plan Determination for the Yuba-Bear, Drum-Spaulding, and Rollins Projects, February 23, 2009, p. 21. Accession #20090223-3023

<sup>19</sup> PCWA Filing Accession # 20100917-5091

In their DLA, the licensees have effectively accepted PCWA's future water demand growth projections and analysis as a baseline condition without further consideration for potential demand decreases. Contrary to accepting PCWA projections and analysis at face value, we think it raises several issues:

- 1) Would any loss of water be significant?
- 2) If not, what level of water loss to PCWA from the Drum-Spaulding system would be significant, and what level would be sustainable?
- 3) How is significance defined? Are there other factors or forces that might change PCWA's demand for water in general and for Drum-Spaulding in particular?
- 4) Can losses to PCWA of Drum-Spaulding water be mitigated, that is to say, are alternative sources of water available to PCWA in the event that some Drum-Spaulding water is lost to PCWA in some years or every year, in order to carry out environmental improvements and restoration?

Instead of performing this analysis in the DLA's, licensees unilaterally adjusted the baseline without providing any legal or factual basis for doing so:

The comparison of the No Action Alternative and the historical operations of a project frequently yield similar results; in this instance, for the Drum-Spaulding Project [and Yuba-Bear Project] the results differ. The difference here is primarily due to: 1) the inclusion of projected water supply demands (as projected by NID and PCWA).<sup>20</sup>

And:

Third, one should remember that the Base Case, as described in Exhibit B, is a reasonable approximation of hydrological conditions that would occur over the term of the new license if existing license terms and conditions do not change. The Base Case assumes that water demand in the local area will increase, that parties will meet those demands within the confines of their existing consumptive use water rights, and that the projects will be operated to meet that demand. NID believes it is reasonable to compare alternative Project minimum flow releases to the backdrop of these expected future conditions.<sup>21</sup>

While many of the parties are still trying to determine how best to forecast future conditions, the licensees have assumed future conditions will include the projected future demands of Placer County Water Agency *and* Nevada Irrigation District.

In those subsequent discussions, licensees also have proposed to add conveyance losses as part of the consumptive demand, further inflating the potential impacts to water supply of any

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<sup>20</sup> YBDS Draft License Applications, Exhibit B p. B-133

<sup>21</sup> YBDS Draft License Applications, p. E6.3-69.

proposed increases in instream flow that removes water from the combined YBDS system. Licensees have not explained why conveyance losses were charged to consumptive demand, as opposed to loss of hydro water or simply lost to the combined system. Licensees did not disaggregate when the losses occurred, or what the ultimate disposition of water lost at any given time might be; rather, they simply used a formula to calculate conveyance losses and added them onto previous estimations of consumptive water demands against which future flow proposals are going to be measured.

### ***Increased Water Supply Deliveries***

Future Water demand could increase based on Placer County's General Plan and PCWA's Water Resource Planning to meet Placer County water demand. Future water demand could also increase based on Nevada Irrigation District's need to meet planned growth in the NID service area, or if the service area were to be expanded.

### ***Decreased Water Supply Demand***

Future water demand could decrease if raw water prices increase. This could take place in areas served by NID for many reasons, including increased delivery and maintenance costs. In the PCWA service area, future water demand could decrease for many reasons including the special case that PCWA's largest water supply contract with PG&E expires in 2013. If, in renegotiating this contract, PG&E attempts to recover foregone power costs, the cost of raw water to PCWA customers could easily double.

Demand in both systems could be reduced because of reductions in out-of-basin water sales. Demand also could be reduced because of future water conservation measures.

### ***PCWA's Raw Water Management***

The PG&E and NID FLA's should not assume that PCWA will sell all the raw water it currently projects in its future water demand growth. Water sales are subject to economic forces of price elasticity's effects on supply and demand. As mentioned above, if PG&E and PCWA's new water contracts (expiring in 2013) set a higher price for PCWA's raw water purchases, this could decrease future water demand growth. Alternatively, less water may be available for sale because more water is going to be restored to the Yuba and Bear Rivers.

Therefore, the PG&E and NID Final License Applications, and FERC's NEPA document, should describe PCWA's options to replace water if PCWA faces a reduction in water purchased from PG&E. PCWA can replace water it may no longer receive from the YBDS system at a cost of \$80/af for the American River Pump Station to pump out of North Fork American River.<sup>22</sup> In their FLA's, PG&E and NID should also describe the degree to which PCWA's treated water customers can reasonably be expected to increase their subsidization of PCWA's raw water customers.

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<sup>22</sup> Pers communication Einar Maisch, PCWA. December 9, 2010.

The Licensees' FLA's should also describe the potential reduction in future water demand growth based on the price elasticity of water if PG&E attempts to recover its foregone power costs and PCWA's raw water costs increase. (See Appendix B: Analysis of Price Elasticity of PCWA's Raw Water)

As we understand it, the price elasticity of raw water is high, and PCWA has concerns about raising raw water rates producing a "cascade effect", in which less water is used, causing prices to go up, causing less water to be used. The wholesale and retail prices of YBDS water are far below the market, resulting in mal-distribution of resources, and resulting in large value transfers from PG&E to PCWA.

### ***Out of Basin Sales***

The PG&E and NID FLA's should describe water sales by PCWA and NID to downstream users. For example PG&E sells YBDS water to PCWA, which allows PCWA to sell Middle Fork American water to entities south of the Delta.

In addition, NID has sold water to South Sutter Water District (SSWD) in the last three Dry years 2007, 2008, and 2009 under a year-to-year contract. In turn, in 2007-2009, SSWD sold 10,000 acre-feet of water each of these years to Department of Water Resources contractors south of Delta. Based on SSWD's water sales in these dry years, it appears that South Sutter can afford an annual reduction in water deliveries from NID of 10,000 af/year.

These out-of-area water sales should be part of the analysis of water supply demand in the FLA's and in FERC's NEPA document because they are relevant to analysis of water supply as it affects hydropower operations and necessary to evaluate the accuracy of licensees' assumptions regarding future demand.

### ***Future Water Conservation***

The Foothills Water Network also objects to the reservation of water demand for the next 30 to 50 years, during which time we will certainly see increased water conservation regulation and economic drivers that will change water use. Among reasonably foreseeable future water conservation regulations, demands and voluntary efforts are:

- Bay Delta requirements could demand more water from Yuba and American Rivers.<sup>23</sup>
- Requirements under SBX7 7 (2009) that domestic water use be reduced by 20% on a statewide basis.
- California Urban Water Conservation Council Best Management Practices increases and revisions. PCWA follows the Sacramento Water Forum water conservation best management practices, which are set by the California Urban Water Conservation Council. The Council's BMPs could change and potentially include a total percentage of water saved.

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<sup>23</sup> See Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem, approved by the State Water Resources Control Board, August 3, 2010.

- NID could become a member of the California Urban Water Conservation Council and implement its Best Management Practices (BMPs), which would save water in the future.
- Development of Best Management Water Conservation Practices for ditches and canals, on some other basis, and/or systemic improvements in reducing canal losses in the combined hydro and water supply delivery systems of PG&E, NID and PCWA.

These and other opportunities and requirements for future water conservation by NID and PCWA should also be part of the overall water supply analysis in the FLA's and in FERC's NEPA document.

### ***Water Supply Constraints as Rationale for Minimum Flows***

To date, FERC has maintained a “hands off” approach to water supply issues in the Yuba-Bear / Drum-Spaulding Projects. Water supply has been considered to be a fixed, independent constraint, dictated by the water purveyors. However, the Yuba-Bear / Drum-Spaulding Projects are operated for dual-purposes - power generation and water supply. Not only have the Licensees included future water demand growth in the base case for the DLA, their rationale for minimum flows is in some cases based on water supply demands. For example, the Licensees state in their respective DLA's:

In South Yuba River below Lake Spaulding Dam, Licensee is proposing to maintain the existing 5 cfs Minimum Streamflow requirement (at gauge YB-29) in Critically Dry water years because any increase in Streamflows in such years would increase water supply deficits (based on water supply demand projected by PCWA and NID over the course of the next license term).<sup>24</sup>

The licensees have brought the issue of water supply to the fore of the relicensing, acting upon the premise that the some of the hydropower facilities are operated to meet water supply demands, which incur their own impacts on the environment. While some diversions and hydropower generation would take place regardless of the water supply demand simply based on the goal of maximizing power generation. These differences need to be teased apart and considered in order to inform development and environmental analysis of future license measures.

PG&E and NID should analyze the differences between the water that is diverted for water supply and water that is diverted for hydropower exclusively to inform their FLA's. The analysis should focus on NID and PG&E's power generation and water supply operations related to diversions from Spaulding Reservoir into the Drum Canal. While PG&E sells some of this water to PCWA for water consumption, PG&E diverts some of it exclusively for power generation and abandons it in Folsom Reservoir, below Newcastle Powerhouse. Please see the Foothills Water Network October 18, 2010 response<sup>25</sup> to PCWA's letter for our analysis of water diverted exclusively for hydropower and abandoned in Folsom Reservoir.

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<sup>24</sup> PG&E Drum-Spaulding Draft License Applications Appendix E7, page 7-13

<sup>25</sup> FERC Accession # 20101018-5103

## 4 Base Cases and Model Runs

### 4.1 Development of the Base Case for the HEC ResSim Water Balance Model

Consistent with their inappropriate view of the water supply baseline, newly revised in their DLA's, licensees simultaneously, in September and October, 2010, unilaterally revised the base case in their HEC ResSim water balance model. The base case is the standard against which all proposed streamflow measures in the coordinated relicensings will be evaluated.<sup>26</sup>

#### **Poor Process for Base Case Modifications**

The Network was chagrined to learn that the Licensees had modified the base case to include projected future water supply demand, without notification or discussion with relicensing participants, during a period in which negotiation meetings were taking place. This unilateral action in response to a water purveyor/ stakeholder who had not theretofore generally been an active relicensing participant, not only modified water supply metrics for that participant (PCWA). NID also took this as an opportunity to modify its own base case inputs for examining when proposed model runs of flow scenarios would appear to affect its own water supply capacity. This additional *sub rosa* gaming of the model was particularly objectionable to members of the Foothills Water Network.

Though this process may not have been intended to be secretive, it should have been discussed with relicensing participants before the base case was modified. The news that the Licensees had altered the base case came out as a side note that some of the model runs, which we were comparing during a relicensing meeting, had been run on the 'old' base case, while others had been run on the 'new' base case.

The Licensees have displayed a lack of sensitivity to how their unilateral actions might be perceived, and failed to provide clear notification and discussion of what is surely one of the major decisions in this relicensing. As a process matter, we ask that Licensees consider modifying the lines of communication and management which perpetuated the action without planned discussion or prior notification of the rest of the relicensing participants.

#### **Modeling of the Projected Water Demand Growth Figures**

The PG&E and NID FLA's should include a No-Action Alternative (modeled as the HEC ResSim Base Case) that represents existing conditions, not including projected water demand growth. As a sideboard, Licensees can then model a Projected Water Demand Growth

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<sup>26</sup> The licensees also made the following adjustments to the base case, when compared to historic conditions: the retirement of the Unit 2 of the Alta Powerhouse; the revised coordination of operation between PG&E's Dutch Flat 1 and NID's Dutch Flat 2 powerhouses; PG&E's modified winter/spring operations since 1997; and gross and useable storage estimates generated by the PG&E's 2007-2009 bathymetric studies, where applicable. FWN has no objection to these four modifications. See PG&E DLA Exhibit B p. B-133

Alternative for comparison against the No-Action Alternative. In modeling nomenclature, this could be designated as Base Case, and Base Case With Buildout (or Base Case with Future Projected Water Supply Demand). This transparent, straightforward approach was adopted, with little controversy, by Placer County Water Agency in the ongoing relicensing of its Middle Fork American Project (FERC #2079).

The Foothills Water Network has also proposed several model runs that project reduced water demand in the future, and may propose others. These model runs will be helpful to licensees, to FERC, and to other parties in evaluating alternative water supply scenarios for both the FLA’s and for FERC’s NEPA analysis.

The Final License Applications should present a replacement for DLA Table 7.1-1 (which is reproduced below). This replacement table should show actual monthly water supply deliveries at each of the delivery points, for both NID and PCWA, for the last ten years (2000-2009). The table should not include real or estimated conveyance losses; as a separated note, licensees may if they wish state what they believe conveyance losses to each point of delivery to be. In order to more fully understand opportunities for water efficiency, the FLA’s should also describe estimated conveyance losses between points of delivery from hydro project facilities and actual deliveries to customers. One way of estimating these latter conveyance losses would be to compare the amount of water taken at delivery points from the hydro project with amounts of water billed for by the water purveyor entities.<sup>27</sup>

In the FLA’s, licensees should, in a clearly titled separate table, state the projected monthly future water supply demand for each of the delivery points from Yuba-Bear and Drum-Spaulding project infrastructure.

**Table 7.1-1. Recent historical and projected future water demands, by Drum-Spaulding Project delivery point.**

Water Delivery Point	Recent Historical Demand (acre-feet/year) <sup>1</sup>	Projected Demand (acre-feet/year) <sup>1</sup>	Percent Increase
NID-1 <sup>2</sup>	7,615	7,615	0.0%
NID-2 <sup>2</sup>	45,915	49,478	7.8%
NID-3 <sup>2</sup>	64,430	76,100	18.1%
PCWA-1 <sup>2,3</sup>	5,893	14,000	137.6%
PCWA-2 <sup>2,4</sup>	6,459	7,506	16.2%
PCWA-3 <sup>2,4</sup>	13,716	15,914	16.0%
PCWA-4 <sup>2,4</sup>	4,172	4,836	15.9%
PCWA-5 <sup>2,4</sup>	62,036	72,144	16.3%

<sup>1</sup> Demands do not include Project or non-project conveyance losses.

<sup>2</sup> Demand derived from NID’s 2032 Raw Water Master Plan; PCWA’s projected demands were provided to PG&E by PCWA in September 2010.

<sup>3</sup> Demand in PCWA’s Zone 3.

<sup>4</sup> Demand in PCWA’s Zone 1.

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<sup>27</sup> See for example PCWA’s Comprehensive Annual Financial Report for 2009, [http://www.pcwa.net/main/2009\\_CAFR.pdf](http://www.pcwa.net/main/2009_CAFR.pdf). Further collaboration between licensees and PCWA may be needed in order to generate accurate estimates of PCWA system conveyance losses for Drum-Spaulding water.

On January 20, 2011, as these comments were being developed, licensees distributed to relicensing participants an Excel spreadsheet<sup>28</sup> that contains most of the information requested above, except for a description of water losses between the delivery point from hydro project facilities to actual points of consumptive use. This spreadsheet is very helpful, and is included as Appendix D to these comments. The Network recommends that this Excel file be included as an appendix to the FLA's, and that printed excerpts be organized in the FLA's as recommended above.

In discussions among relicensing participants, including licensees and PCWA, in December, 2010, consideration was given to the best way to represent recent historic conditions, for purposes of reconsidering a modeling base case. PCWA representatives stated that their agency viewed the maximum annual water delivery in a recent year as the appropriate benchmark for existing conditions. Nevada Irrigation District took this one step further, and presented a spreadsheet that included maximum annual diversions for each separate point of delivery, and then picked and chose individual maximums at different delivery points from different years to produce an amalgamated maximum.

In our December relicensing meeting, Agency and FWN relicensing participants proposed that an average of the last ten years of annual deliveries to each delivery point be adopted as the most appropriate representation of existing conditions. Part of the consideration behind this proposal was that recent deliveries seem to vary somewhat by water year type, and the most recent deliveries to each delivery point were generally not the years of maximum deliveries to those points. FWN continues to believe that this averaging approach is the most accurate and fair for purposes of a Base Case against which other modeling alternatives will be evaluated.

Review of the "Summary" tab of the January 20, 2011 water delivery spreadsheet, and especially examination of cells 10I and 10J and cells 19I and 19J, demonstrates the critical importance of how baseline conditions of water supply delivery are described. The difference in combined (NID plus PCWA) water deliveries, between the 2001-2009 historic average deliveries (with conveyance losses as presented by licensees) and deliveries projected in the annual Base Case as portrayed by licenses, is 43,728 acre-feet per year. This is roughly 10% of the average annual amount of water exported from the Yuba watershed by the projects.<sup>29</sup> To put this in perspective, 43,728 acre-feet of water per year restored to the South Yuba and the Middle Yuba might be sufficient to support reintroduction of spring-run Chinook to both of those rivers.

The presentation of conveyance losses at each point of the system is also, as noted above, extremely troubling to the Network. Licensee's calculation of these losses is provided on the "Water Delivery Targets for DSS" tab of the January 20, 2011 spreadsheet, columns AH through AR, lines 5 and 6. The stated canal losses for each delivery point appear to be estimated (in some cases, based on contractual stipulations). The Network undertook a brief, preliminary analysis of actual, rather than estimated, conveyance losses for the project. We reached several preliminary conclusions. First, there are at times significant accretions to project canals that do not appear to

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<sup>28</sup> The spreadsheet is entitled "YBDS water delivery historical and projected summary 2001-2009."

<sup>29</sup> An average of about 125,000 acre-feet of this water is not delivered locally for consumptive purposes. [See analysis in FWN response to PCWA in Appendix E of this document]

be accounted for with a coefficient calculation. Second, actual conveyance losses appear to be spiky, suggesting that significant conveyance losses are linked to individual events, which the Network thinks may perhaps be tied to system outages.

Therefore, in addition to the fact that the Network disagrees with the inclusion of conveyance losses as part of the water supply baseline, the Network recommends that the FLA's and FERC's NEPA document conduct an accurate analysis of actual measured conveyance losses within both the hydro system and within the infrastructure that delivers water for strictly consumptive purposes once it has left the hydro system.

## **5 General Analytic Methodology for Development of Flow Regimes**

The Network appreciates the fact that the Licensees lay out in their DLA's their flow development process and its target objectives. Though we disagree with the process as it is laid out, we appreciate the opportunity to engage with the Licensees on a scientific level over the targets for enhancements and tools for determining instream flows.

### **5.1 Developing Flow Regimes for Comprehensive Planning**

The PG&E and NID FLA's should take a comprehensive planning approach to developing flow regimes for the project-affected reaches. A comprehensive planning approach will not only take into account what resources should be enhanced on each individual reach, but also what resources should be enhanced that will, together, enhance the whole watershed.

The overall goals of hydropower generation, water supply, aquatic resource enhancement, and recreation should be the overarching themes of the comprehensive planning effort. The aquatic resource objectives should be primarily to enhance the fisheries and Foothill Yellow-Legged Frog populations. In most cases, we recommend that recreation interests take advantage of flows that are primarily for aquatic resources.

Specific objectives such as preserving the coldwater pool and using that water to cool water temperatures in priority river reaches must be addressed by combining the results of multiple modeling tools that address different facets of the two projects. The PG&E and NID FLA's should use the Reservoir Temperature Models (which take into account the Milton Bowman and Bowman-Spaulding Canals), the river reach Water Temperature Model, and the Water Balance Model to examine flow regimes in a network of river reaches that result in cooling temperatures and increasing flows in the South Yuba below Spaulding and in the Middle Yuba below Milton Diversion Dam. In short the NID and PG&E FLA's should outline how to organize the modeling of the interconnected cold water system to provide the maximum benefits to the rivers, hydropower, and water supply.

For example, the modeling effort should try to answer if and how it is possible to provide cold water to the South Yuba River with cold water from Bowman or even Jackson Meadows in the

hottest months of the year. In order to resolve this question, the Licensees should model the releasing cold water from the Bowman-Spaulding Canal into Fall Creek so it can cool the South Yuba River. These overarching questions spatially connect the objectives of one reach to another, resulting in flow regimes that are developed for dual purposes: enhancement of downstream reaches and enhancement of the individual reach itself.

The PG&E and NID FLA's should recast their process for developing flow regimes on specific reaches so that their process is dominated by temperature criteria and takes into account a broad spectrum of options for water delivery and cold water management. Because of the primacy of temperature to our target species, exploring and resolving these types of cold water management questions should be the first process step in developing flow regimes for specific reaches. The complexity of these projects offers a myriad of delivery and conveyance points through which to manage cold water more efficiently and to better benefit the aquatic resources.

At a minimum, the PG&E and NID FLA's should include a proposed flow regime using some combination of Fall, Rucker, Trap, Clear, and Canyon Creeks to convey cold water to the South Yuba River below Spaulding Reservoir. The FLA's should also examine broadly and individually how flow releases in the upper Lakes System upstream of the Bowman Canal and upstream of Spaulding Reservoir can be managed to cool river temperatures downstream of Spaulding Reservoir. The licensees' FLA's should also discuss how they propose managing the coldwater pool in Jackson Meadows and Milton, Spaulding, and Fordyce to most effectively distribute cold water during the summertime to cool river temperatures when they are most lethal to fish. The FLA's should include a flow regime that converts the Bear River below the Bear River Diversion Canal from a warm-water fishery to the Basin Plan mandated cold-water fishery.

The PG&E and NID FLA's should also examine scenarios for redistribution of cold water in terms of the foregone power and in terms of flexibility values for water supply and hydropower generation.

## **5.2 Habitat Duration Analysis**

Habitat Duration Analysis (HDA) as it has been proffered in this relicensing<sup>30</sup> is foremost a technically-enhanced means by which licensees and their consultants game Weighted Usable Area (WUA) in PHABSIM modeling of fish habitat. Embedded within the pre-calculated logic (described as "one stop shopping" by one of the licensees' consultants) are assumptions that are not agreed to by other relicensing participants. Despite disclaimers by licensees, HDA as employed by these licensees and their consultant is not simply "a tool". The built-in assumptions are inherently biased towards reducing the amount of water that appears to be required to meet a desired level of velocity and depth in a given reach of a river or stream.

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<sup>30</sup> Contrast use of time series analysis by consultant Entrix in the ongoing relicensing of the nearby Middle Fork American Project (FERC #2079). By agreement with resource agencies and other relicensing participants, the time series analysis was not used by licensee Placer County Water Agency to develop flow recommendations.

To our knowledge, Habitat Duration Analysis has never been accepted, approved, or used by resources agencies in California. It is not and has not been approved by the conservation groups in the Foothills Water Network or the California Hydropower Reform Coalition. It is not “accepted scientific practice.”

Over a third of the 140 pages in Exhibit E, Section 6.3 Aquatic Resources consists of charts and graphs providing output from Habitat Duration Analysis. HDA forms the foundation of proposed instream flows. The HDA program itself has been refined to a slick format that at once captures and conceals assumptions with which the rest of relicensing participants disagree. This starkly contradicts professed collaborative intent, and blunts collaborative initiative by licensees.

Below, we analyze specific issues with the Habitat Duration Analysis program as developed by consultants HDR/DTA and used in this relicensing.

1. The program averages each reach geographically. As presented in the Draft License Application, the habitat for any given reach includes “the average accretion in each reach or subreach.” The program thus automatically conceals the effect of the project on the stream reaches directly downstream of project facilities, the location of the greatest project impacts on trout habitat. This not only gives licensees credit upstream for what happens downstream, but fails to adequately disclose the environmental impacts of the project.
2. The HDA as used by HDR/DTA elevates the importance of habitat modeling to times of year that it is inappropriate. Leaving aside disputes about the relative value of PHABSIM in general, habitat modeling is most appropriate in examining periods of summer and fall base flow.<sup>31</sup> While high winter or spring flow events might skew the monthly averaging metrics used by HDA, such events have important direct and indirect benefits to trout in terms of channel formation, bedload transport, effects on snow and ice in the channel, etc. During low flows at high elevations in winter, survival and feeding are more dependent on site-specific conditions than on depth and velocity.<sup>32</sup> (See Appendix F for Needham and Jones “Flow, Temperature, Solar Radiation, and Ice in Relation to Activities of Fishes in Sagehen Creek, California”) Adverse winter conditions for fish may also result from natural high flow or from spill events which cause abrupt changes in flow, particularly if following these events flows return to very low flow releases; PHABSIM does not address these phenomena.
3. Licensees mischaracterize activities of trout during winter, and then use this mischaracterization as a wholesale justification to reduce winter flows, calculated on the basis of a percentage of monthly averaged WUA. The DLA states:

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<sup>31</sup> In the relicensing of the Middle Fork American Project, consultant Entrix developed time series for spawning in March through May, and for adults in June through September.

<sup>32</sup> See Needham and Jones, 1959, “Flow, Temperature, Solar Radiation, and Ice in Relation to Activities of Fishes in Sagehen Creek, California,” *Ecology*, Vol 40, No 3, attached as Appendix F. See discussion of mortality pp 472-473. See discussion of active winter feeding by trout p. 471. This seminal research was conducted about 40 miles from Lake Spaulding.

In winter months (i.e., December through March), NID reduced the 90 percent rainbow trout adult target habitat from 80 percent to 70 percent and the 100 percent exceedance target from 65 percent to 60 percent because trout are much less active and do not feed as extensively during winter. Once winter temperatures drop below certain thresholds, trout behavior shifts from active feeding to seeking refuge from predators and harsh environmental conditions.<sup>33</sup>

Needham and Jones (1959) observed:

Trout were observed to feed on numerous occasions when the water temperature was between 32.0°F and 33.0°F. The fact that trout will actively feed when the water temperature is 32°F is clearly demonstrated by the following observation.... While we have no precise measure of the magnitude of activities observed, the main difference seems to be one of speed. In feeding observed during summer periods, the actions of the fish were more rapid and their reactions in general seemed much faster.<sup>34</sup>

If anything, Needham and Jones suggest that flow variability that could break up snow and ice in the winter might be beneficial both in dislodging additional food and in reducing threats from “harsh environmental conditions.” However, both in the Yuba-Bear and Drum-Spaulding projects and in many other projects in California’s Sierra Nevada, the paradigm for high elevation winter flows is low flat-line flows to save water and do little more than keep the stream channel marginally wet. The Lake Valley Diversion Dam reach of the North Fork of the North Fork American River is one of the worst examples of this on the Drum-Spaulding project, where under the current license an already pitiful summer minimum flow of 3 cfs is cut back to 1 cfs over the winter.

It is also worth noting that in the Bear River below Rollins Reservoir, both rain and snow have significant effects on winter stream flows. Therefore, greater thought should be given to this reach in particular, especially to address dramatic flow reductions after spill events. A large stream channel with public access, this reach is one of the better fishing reaches on the projects. At present, the required winter flows are substantially less than required flows in summer.

4. The “Area under the curve” in HDA compares the modeled monthly average of habitat under the average daily regulated flow in a given reach with the modeled monthly average of habitat under the average daily unimpaired flow in that reach. This comparison with the unimpaired is selective, inappropriate, and biased.

Hydropower operations regulation of instream flow changes channel structure. The Licensees’ comparison of modeled habitat with unimpaired flow quantities ignores channel degradation, concealing the differences between impaired and unimpaired conditions.

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<sup>33</sup> YBDS Draft License Application, Exhibit 6, p. E6.3-50.

<sup>34</sup> Needham and Jones, *Ibid.*, p. 471.

The benefits of high flows to fish are often indirect. High flows transport sediment and maintain channel structure. Even in bedrock-controlled streams, high flows reset biological “hot spots” which provide essential spawning habitat and food production. High flows also scour riparian vegetation that often encroaches into regulated stream reaches because of lack of variability. The recession limb of the snowmelt hydrograph is also critical in establishing appropriate riparian communities and retention of point bar mobility (this is addressed in more detail in the Section 5.5 Snowmelt Recession). The benefits to fish and other biota of unimpaired high flows, recession, and flow variability are not captured by the comparison of modeled habitat under regulated and unimpaired flow magnitudes.

On the other hand, averaging over a month-long periods tends to conceal or minimize areas of prolonged low flow. Fish are often most stressed or subject to lethal conditions during low flow periods. Regardless of unimpaired conditions, hydroelectric operators like all dam operators have a responsibility to maintain conditions for fisheries in project-affected streams at all times, every day, not simply on an *average* monthly basis.

5. In an introduction of Habitat Duration Analysis presented to relicensing participants on July 26, 2010 by the Licensees’ consultants, HDR/DTA stated: “The WUA function is a static relationship between discharge and habitat. WUA represents only the *potential magnitude* of available habitat.” HDR/DTA continued: “A habitat duration analysis (HDA) integrates WUA with hydrology to represent the magnitude and duration of available habitat seasonally, under different operational regimes, and water year types.”

What is fundamentally static about PHABSIM is that it equates depth and velocity with habitat. It breaks a river up into transects (1-D) or segments (2-D) and looks at where weighted depths and velocities occur, and then extrapolates the modeled area over the entire river reach. HDA in particular reduces a comparison between impaired and unimpaired conditions to a comparison of a static measure of depth and velocity in impaired and unimpaired conditions. The dynamic functions of rivers are not recaptured by extending this static equation of depth and velocity with habitat, and then seeing how this extension plays out month after month. A dynamic vision takes into account physical and biological functions that occur within rivers. For example, flows during the recession limb of the snowmelt hydrograph often will not meet ideal WUA quantities, yet the benefits of increased food production during this time of year far outweigh the fact that velocities do not conform to the static description of modeled habitat. According to Yarnell et al (2010),<sup>35</sup> the spring snowmelt recession is the most productive period for fish in the Mediterranean climate of California. (see Appendix G: Ecology and Management of the Snowmelt Recession, Yarnell et al)

6. WUA curves are notoriously inaccurate at very low discharges. WUA is often not modeled at discharges under 5 or even 10 cfs, but is rather extrapolated from curves given at higher discharges. This creates significantly wider error bars than will be seen with greater discharges. Many of the required flows in the Yuba-Bear and Drum-Spaulding projects are 5 cfs or below.

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<sup>35</sup> Yarnell, Sarah M.; Viers, Josh H.; Mount, Jeffrey. *Ecology and Management of the Spring Snowmelt Recession*. Bioscience, Vol. 60 No. 2. p. 114-127.

When looking at a standard WUA plot, the absence of modeled values is readily evident. However, when WUA is buried in multiple “Area Under the Curve” plots and charts, the relative inaccuracy of the data is no longer transparent.

7. In incorporating accretion into the modeled values, the licensees’ and HDR/DTA’s use of Habitat Duration Analysis seeks to compare the effects of unenforceable alternatives. Inclusion of accretion incorporates into a supposedly technical tool the assumption that future hydrology, and especially unimpaired runoff, will be effectively the same as past hydrology.

In sum, the Habitat Duration Analysis that has been presented by licensees’ consultants starts from an industry standard of over-reliance on PHABSIM. The licensees then game the outcome to have a built-in bias of what we would estimate would reduce required streamflow by 25-30%.

The Foothills Water Network believes that there are many considerations for setting stream flows in the Yuba-Bear/Drum-Spaulding relicensing that are more important than PHABSIM. These include use of temperature models, examination of the snowmelt hydrograph, and examination of flow variability in winter months. The Network also believes that reintroduction of anadromous fish to the South Yuba and Middle Yuba rivers, and the life history needs of these fish, must be considered.

To the degree that we rely on PHABSIM to set stream flows for project-affected stream reaches, the Foothills Water Network recommends that HDA be discarded from this process. The use of WUA curves and hydrology in side-by-side representations in evaluating streamflow alternatives is neither particularly complex nor burdensome. The degree to which accretion is factored into setting stream flows on any reach should be done on a site-specific basis, as an open topic of discussion. If low WUA values are present, or are extrapolated, this should be transparent. Water availability in one of the most managed hydropower systems in the county should be addressed through management alternatives according to interests, not gamed against a competitive vision of unimpaired hydrology.

The presentation of 50 or so pages of HDA charts in the PG&E and NID Draft License Applications is truly a poor use of technical resources. The licensees are fully able to represent their interests without relying on a technical aid that automatically cranks out reduced flow numbers. Licensees’ use of Habitat Duration Analysis is not only unproductive, it is unnecessary.

### **5.3 Coldwater Pool Management**

The YBDS Projects’ massive diversions from the Middle Yuba, South Yuba, and Bear Rivers increase the degree of temperature impairment and the linear extent of river that is impaired. By late summer, the majority of the temperatures in the Middle and South Yuba Rivers’ are in excess of 76 degrees, a lethal level of native trout.

SYRCL has submitted evidence to the State Waters Resources Control Board that the Middle and South Yuba Rivers are impaired by water temperatures in excess of standards for the Basin Plan and criteria for native species such as rainbow trout. SYRCL filed this evidence with FERC

in its August 19, 2008 comments on the Yuba-Bear and Drum-Spaulding Pre-Application Documents. This submission states:

SYRCL's River Monitoring program involves monthly measurements of river temperature using bulb spirit thermometers. A total of 13 sites have been established since the inception of the program in 2001 (Table 1). The acute threshold of lethality for *O. mykiss* (24 C) was exceeded in 2001, 2002, 2004, and 2005. These temperatures are almost certainly elevated as a result of less than 5% natural flow below Spaulding as an effect of the Drum-Spaulding and Yuba- Bear hydro projects.<sup>36</sup>

SYRCL's submittal resulted in the State Board's designation of the South Yuba River as 303d listed. USEPA approved California's 2008-2010 Section 303(d) list of impaired waters requiring TMDLs. That list included the South Yuba from Spaulding to Englebright for Temperature and a TMDL date of 2021.

Water temperature in the South Yuba River does not meet the State Water Resources Control Board's Basin Plan criteria, despite a claim that "(w)ater quality and temperatures in the Project reservoirs and affected stream reaches appear to be consistent with the Basin Plan."

Coldwater pools in project reservoirs are a critical resource for the provision and maintenance of habitat for cold-water fishes in downstream reaches. The FLA's should include operational alternatives for management of this resource for the objective of supplying maximum habitat to trout, as well as to salmon when present. Analysis of these alternatives should draw on results of the temperature models and operational models. It is possible that relicensing participants will prefer different alternatives in different water years according to different priorities in downstream reaches.

#### **5.4 Temperature Thresholds**

Water temperature models for the South and Middle Yubas and Canyon Creek are functional at the time of writing these comments. Therefore, the Network recommends that PG&E and NID's FLA's include minimum instream flows based on temperature criteria for the aforementioned river reaches.

In the Section 6 of these comments (Recommendations for Priority Specific Stream Reaches), we recommend temperature thresholds and compliance points that will provide for thriving populations of rainbow trout. Spring-run Chinook salmon have slightly cooler temperature requirements, but this species would benefit from these temperature criteria, when present, due to the necessity to provide cooler water above the compliance points. The chosen threshold is a maximum daily average temperature of 19 degrees C. This value represents the optimum range

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<sup>36</sup> South Yuba River Citizen's League submittal to State Water Resources Control Board, February 28, 2007. The submittal was appended to SYRCL's comments on the Yuba-Bear and Drum-Spaulding Pre-Application Documents 20080819-5079, pp 8-15. Quote is from p. 9.

of temperature for *O. mykiss* in Central Valley Rivers (Myrick and Cech 2001), and is an update on previous assessments (e.g. FERC 1993) that have identified 20 degrees C as a threshold for “stressful”.

Standard EPA temperature thresholds for *O. Mykiss* are 19 C (maximum weekly average) and 24 C (acute threshold) (Brungs and Jones 1977).<sup>37</sup> Sullivan et al. (2000) reviewed temperature criteria for salmon and steelhead and developed a model for assessing risk of growth loss and suggest that more appropriate criteria for *O. mykiss* may be 18 C and 21 C, respectively. According to McCollough (1999)<sup>38</sup>, Chinook salmon are more sensitive to temperature than *O. mykiss*. Even lower thresholds of impact apply to California red-legged frog (*Rana aurora draytonii*), a federal Threatened species known to inhabit the South Yuba. The northern red-legged frog has the lowest upper (21°C) and lower (4°C) lethal embryonic temperatures of any North American ranid frog (Licht 1971)<sup>39</sup>.

Please see below for our recommendations for individual stream reaches to meet specific temperature criteria.

## **5.5 Snowmelt Recession Flows**

### **Recommendations**

The PG&E and NID FLA’s should include flows and recession rates to more closely resemble the spring snowmelt hydrograph in specific stream reaches. PG&E and NID should expand the approach outlined below for the South Yuba River below Spaulding Reservoir into a “Snowmelt Recession Analysis and Design.” The licensees should conduct similar analyses on the Middle Yuba River below Milton Diversion Dam, on Canyon Creek below Bowman Dam, and Bear River Reach #2. The analysis should be conducted collaboratively among Relicensing participants.

### **Working Definitions**

**Unimpaired Snowmelt Recession:** Stable (except for diurnal fluctuations), predictably decreasing flows in unimpaired reaches resulting from the melting of a diminishing snowpack in spring and summer.

**Spill Recession:** Decreasing spill flows in spring and summer.

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<sup>37</sup> Brungs and Jones. 1977. Temperature criteria for freshwater fish: protocol and procedures. Ecological Research Series., U.S. Environmental Protection Agency, EPA-600/3-77-061. 130 pp.

<sup>38</sup> McCullough, D. 1999 . A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids, with Special Reference to Chinook Salmon. Columbia Intertribal Fisheries Commission, Portland, OR. Prepared for the U.S. Environmental Protection Agency Region 10. Published as EPA 910-R-99-010.

<sup>39</sup> Licht, L. E. 1971. Breeding habits and embryonic thermal requirements of the frogs, *Rana aurora aurora* and *Rana pretiosa pretiosa*, in the Pacific Northwest. Ecology 52 (1): 116124.

**Regulated Snowmelt Recession or Augmented Recession:** Recession flows achieved by operationally controlling the spill recession so that it more closely resembles the unimpaired snowmelt recession.

## **Overview**

A growing body of research has established that the unimpaired snowmelt recession limb has broad and deep ecological importance (See Appendix G: Ecology and Management of the Spring Snowmelt Recession by Yarnell et al). Stable, descending flows of the unimpaired snowmelt recession limb are integral to properly-functioning springtime aquatic and riparian habitats. Cottonwoods depend on stable flows descending at a predictable rate so that seedling roots can follow the near-shore water table down as the river recedes. Fish populations depend on these flows for a host of ecological services, including migration flows, greater food production in the spring in early summer, and extension of cold water further downstream, later in the summer. Foothill Yellow-Legged Frogs (FLYF) (*Rana boylei*) depend on the early snowmelt recession limb for stable flows without scouring pulses, and, after oviposition, FLYF egg masses depend on a stage recession that does not drop the water surface below the egg mass before emergence of tadpoles because that can desiccate the eggs.

The US Forest Service regards FLYF as a “Species of Concern”, due to FLYF’s apparent wide spread decline. This has resulted in research into FLYF habitat requirements through various life stages. It has long been recognized that rapid flow changes can impact frog populations; recent work quantifies important FLYF habitat measures such as the recession rate that FLYF egg masses can tolerate after oviposition (See Appendix H: Assessment of Risks to Sierra Nevada Populations of Foothill Yellow-Legged Frogs (*Rana boylei*) Under Varying Snow-Melt Hydrograph Recession Rates in Rivers by Lind et al.). In parallel, extensive work has been done to describe the snowmelt recession limb in unimpaired systems. (Appendix I: Epke, Gerhardt; Yarnell, Sarah; Viers, Josh H. Spring Snowmelt Recession Dynamics with Application to the North Fork American and North Fork Yuba River Presentation. December 2010).

Quantitative measures of FLYF requirements of an important habitat “element” – the snowmelt recession limb – coupled with quantitative characterizations of the snowmelt hydrograph in unimpaired “reference streams”, provide the necessary framework for designing PM&E measures that will be protective of FLYF and improve aquatic and riparian habitat downstream of major project reservoirs.

Below is an analysis and design of the creation of a regulated snowmelt recession for three year types. The intent of the analysis is to show, at a “demonstration of concept” level, that it is hydrologically and operationally possible to significantly improve the spill hydrograph so that it more closely resembles the unimpaired spring snowmelt recession limb. The analysis includes a measure of the cost of creating a regulated snowmelt recession in terms of decreased storage at Spaulding.

The analysis also recommends a source of water for creating the snowmelt recession: the conveyance flows through the Bear Valley. Eliminating these conveyance flows would have a two-fold ecological benefit: 1) Instream flow could be increased in the Middle Yuba, Canyon

Creek and the South Yuba and 2) Impacts of the conveyance flows could be reduced in Bear Valley.

### **Applicable Science**

Amy Lind's analysis shows that the recession rate during frog breeding should not be greater than -1' in 3 weeks in order to protect FLYF.<sup>40</sup> Gerhardt Epke and Sarah Yarnell found that recession flows in unimpaired systems typically recede at a delta flow of between -10% per -5% per day.<sup>41</sup>

### **Concept**

Managing the spill recession to more closely resemble the unimpaired snowmelt recession has two parts: reducing the effects of spill events by means of increased base flows; and controlling the recession rate. In the case of the South Yuba River, the base flow can be controlled by releases from Spaulding Reservoir via radial gates. Two variables of the snowmelt recession that are subject to control are 1) the flow at which the descending limb of the spill hydrograph is intercepted and the regulated snowmelt recession begins, and 2) the regulated snowmelt recession rate, in percent per day.

In order to demonstrate how the spill recession should be modified to more closely resemble the unimpaired snowmelt recession, one of the Network's members, American Whitewater, analyzed three water year types: 1997, 1999, and 2003. The authors varied the base flow, snowmelt recession starting flow, and recession rate according to water year type. All inflows and outflows except for the flow in the South Yuba River are kept constant. Because net outflow increases, the Spaulding Reservoir level drops more rapidly than in the historical regulated conditions. The difference in storage is a rough measure of the cost to the licensees of providing the snowmelt recession flows. In this analysis of three water year types, providing the snowmelt recession flows drew Spaulding Reservoir down below the radial gates. The next section shows how eliminating conveyance flows through Bear Valley can reduce or eliminate the draw-down of Spaulding due to creating the regulated snowmelt recession.

### **Approach and Summary of Results**

PG&E can release water from Spaulding Reservoir via the spillway on Jordan Creek once the surface of Spaulding Reservoir reaches the bottom of the 20' radial gates which is equivalent to about 62,000 af of storage. In spill years - all Wet and Above Normal years, and most Below Normal years - this usually occurs by April 15. In general, FLYF breeding occurs after April 15. For these reasons the above analysis of the snowmelt recession begins on April 15. The authors of the analysis checked that the snowmelt recession rate is less than 1' per 3 weeks using the

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<sup>40</sup> Lind, A., Yarnell, S. Assessment of Risks to Sierra Nevada Populations of Foothill Yellow-Legged Frogs (*Rana boylei*) Under Varying Snow-Melt Hydrograph Recession Rates in Rivers  
29 November 2010. USDA Forest Service, Pacific SW Research Station, Davis, CA and Center for Watershed Sciences, University of California, Davis. p. 1-3.

<sup>41</sup> Epke, Gerhardt; Yarnell, Sarah; Viers, Josh H. Spring Snowmelt Recession Dynamics with Application to the North Fork American and North Fork Yuba River Presentation. December 2010.

stage discharge relationship calculated by HDR-DTA for the cross-section at the 2D FLYF modeling site on the South Yuba River above Canyon Creek. For purposes of the study, we used a rule to control flow at Spaulding Reservoir as illustrated in the table below. For each water year type, the table specifies base flow, the intercept flow at which snowmelt recession starts, and the recession rate in percent per day. See Appendix J: Spreadsheet of FYLF Snowmelt Recession Calculations.

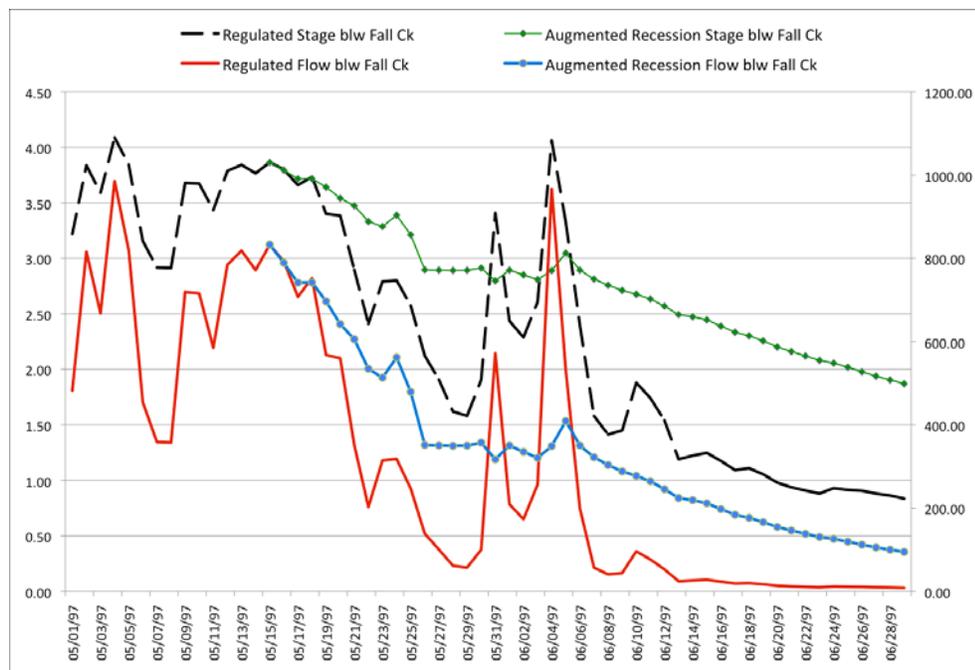
**Table 1 - Rules for Spaulding Reservoir Spring Snowmelt Recession Releases and Resulting Storage**

Water Year	Water Year Type (Apr 1 Smartville)	Base Flow after April 15	Snowmelt Recession Starting Flow	Percent Change per Day*	Storage Cost Acre Feet
97	Wet	300	800	-5%	11,866
99	Above Normal	250	600	-5%	5,477
03	Below Normal	200	400	-5%	13,381

\*For all water year types, a recession rate of -5% per day resulted in a stage drop at the 2D FLYF site of about 1’ in 3 weeks.

### Analysis

**Figure 1 -Comparison of Regulated Snowmelt Recession Flows and Stage to Historic Regulated Flows and Stage on the South Yuba River below Fall Creek, 1997 (Wet Water Year Type)**



Note: “Augmented Recession” is synonymous with “Regulated Snowmelt Recession”

Figure 1 compares the 1997 historic regulated flow and stage “regulated flows” against with the proposed “Regulated Snowmelt Recession Flow Scenario” as determined by the parameters in

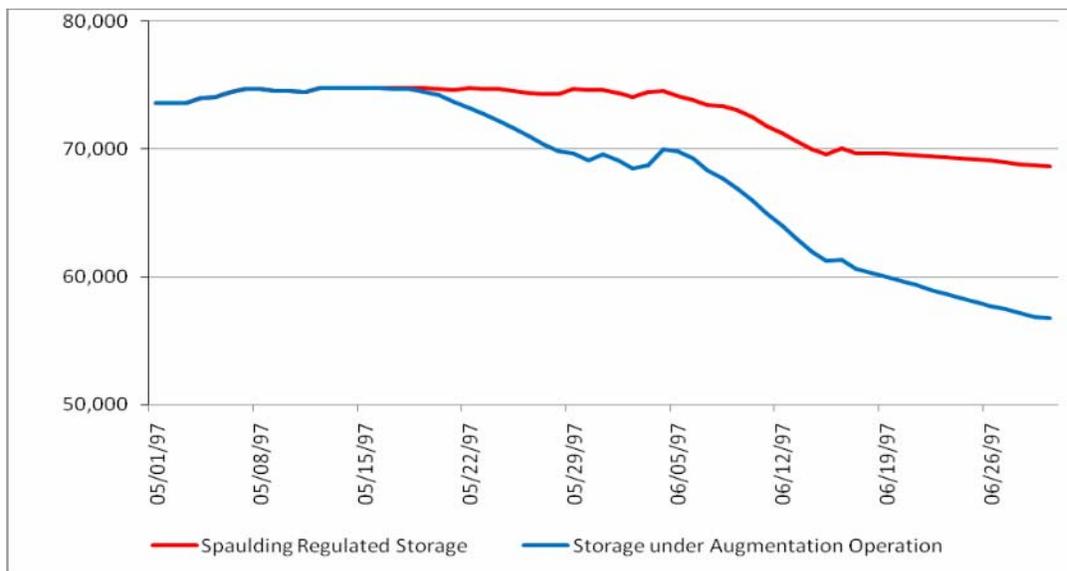
*Foothills Water Network Comments on PG&E’s Drum-Spaulding and NID’s Yuba-Bear Draft License Applications*

Table 1- Rules for Spaulding Reservoir Spring Snowmelt Recession Releases and Resulting Storage. The regulated flow in the South Yuba River below Fall Creek was calculated by taking the flow at Lang’s Crossing and adding accretion between Spaulding Reservoir and the 2D FLYF site on the South Yuba River above Canyon Creek. The Regulated Snowmelt Recession Flow was calculated by reducing the flow by 5% per day beginning on May 15. The stage for both the regulated and Regulated Snowmelt Recession Flows are also included in the graph.

In the “Regulated Snowmelt Recession Flow Scenario”, snowmelt recession decreased to 300 cfs on 5/26/97 and held steady until 5/5/97. Under the Regulated Snowmelt Recession Flow Scenario, from 5/5/97, flow decreased by 5% per day until it reached summer base flow. The combination of the 300 cfs base flow release and the additional snowmelt recession flow releases “dug a hole” in Spaulding Reservoir, eliminating the spill peaks that occurred under historic regulated conditions on 5/31/97 and 6/5/97. Under the Regulated Snowmelt Recession Flow Scenario, higher base flows also dampened the small pulse flows resulting from accretion that occurred under the historic regulated at the 2D FLYF site. In combination, the proposed scenario’s elimination of spill peaks and dampening of the small pulse flows greatly reduced fluctuations of water surface elevation at the 2D FLYF site, protecting FYLF egg masses from being washed away or desiccated.

Upon inspection it seems the Regulated Snowmelt Recession Flow Scenario reduces the South Yuba River’s stage level at about 1 foot in 3 weeks between 6/06/97 and 6/27/97, which would protect FYLF from flow fluctuations in their nascent and less mobile life stages.

**Figure 2 - Comparison of Spaulding Reservoir Storage under Historic Regulated Operations and Regulated Snowmelt Recession Flow Scenario, 1997**

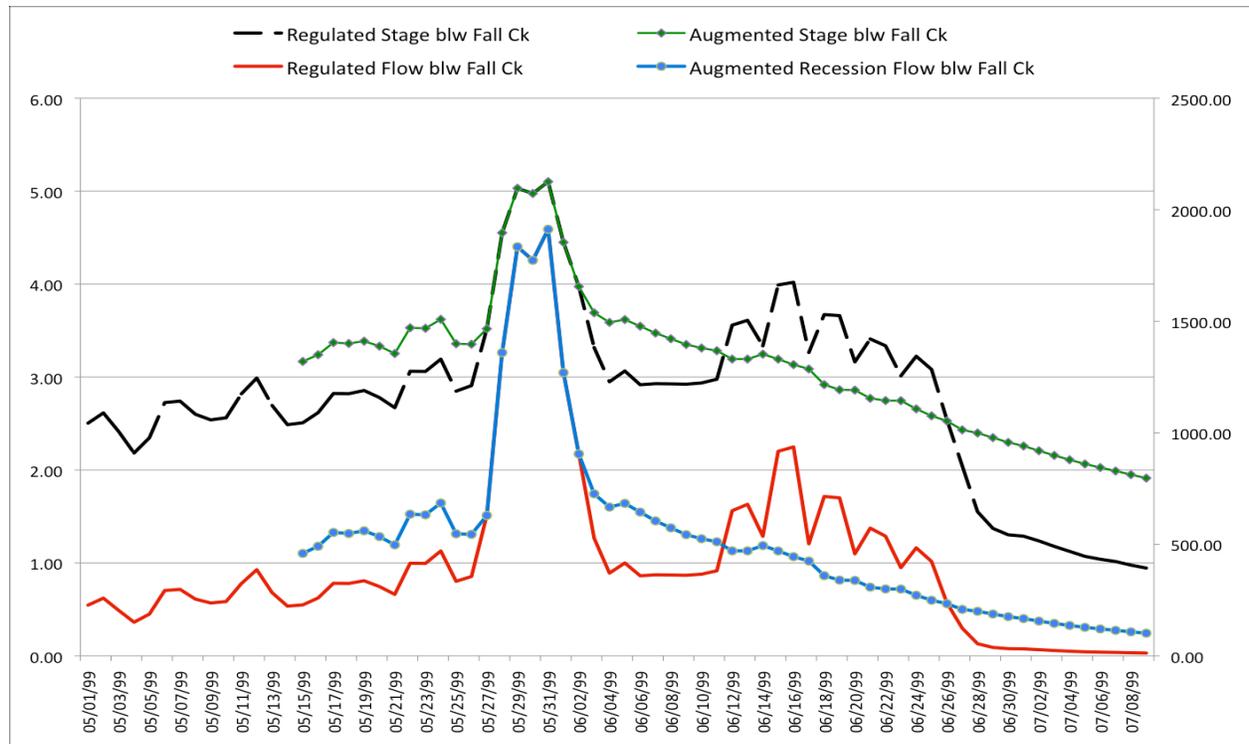


The Regulated Snowmelt Recession Flow Scenario as applied to the historic 1997 regulated snowmelt recession, modifies the spill hydrograph to more closely resemble the snowmelt recession. As can be seen in Figure 2, the augmented recession flow scenario draws the regulated snowmelt recession draws down the surface of Spaulding Reservoir considerably below the

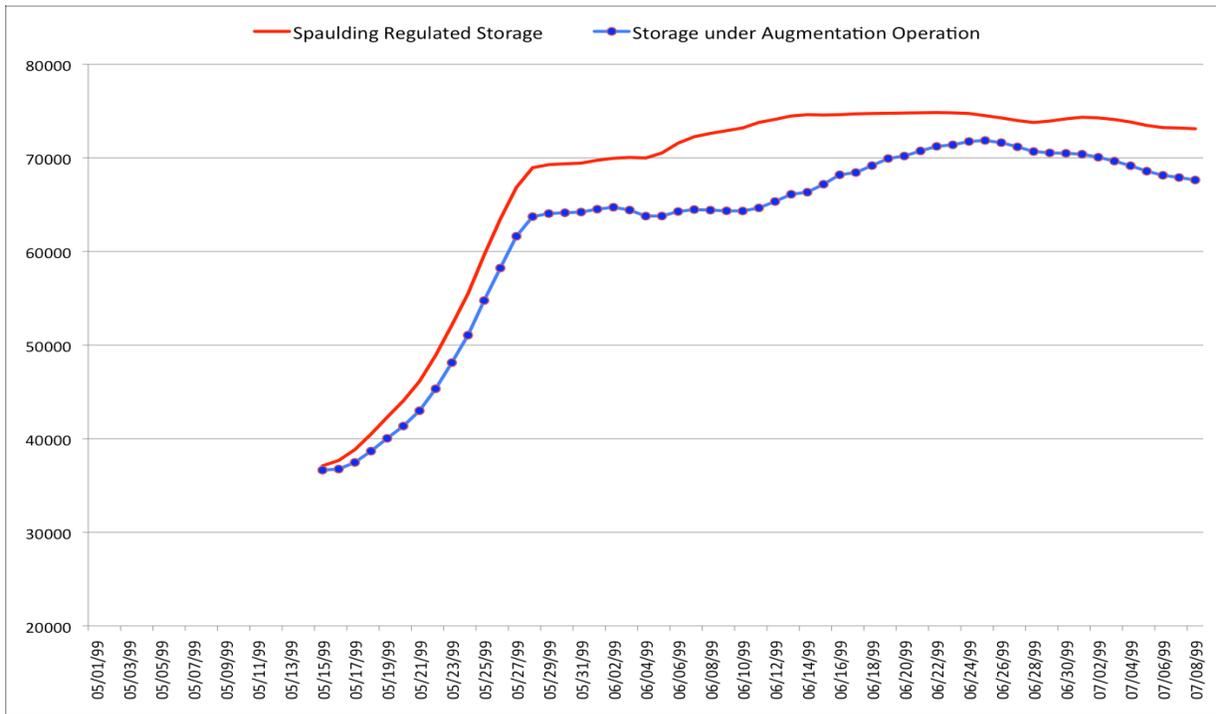
bottom of the 20' gates, which is at storage level 62,000 af. In real world operations, PG&E and NID would adjust canal flows to keep water on the gates of Spaulding Reservoir until the end of the snowmelt recession flows and return to minimum instream flows. The following section on Bear Valley conveyance flows illustrates how the drawdown of Spaulding Reservoir could be avoided by eliminating Bear Valley conveyance flows.

**Figure 3 - Regulated Stage and Flow on South Yuba River below Confluence with Fall Creek, 1999 (Above Normal Water Year Type)**

**Augmented Recession Scenario based on Base Flow = 250 cfs; Snowmelt Recession Starts = 600 cfs; Recession Rate = -5% / day**

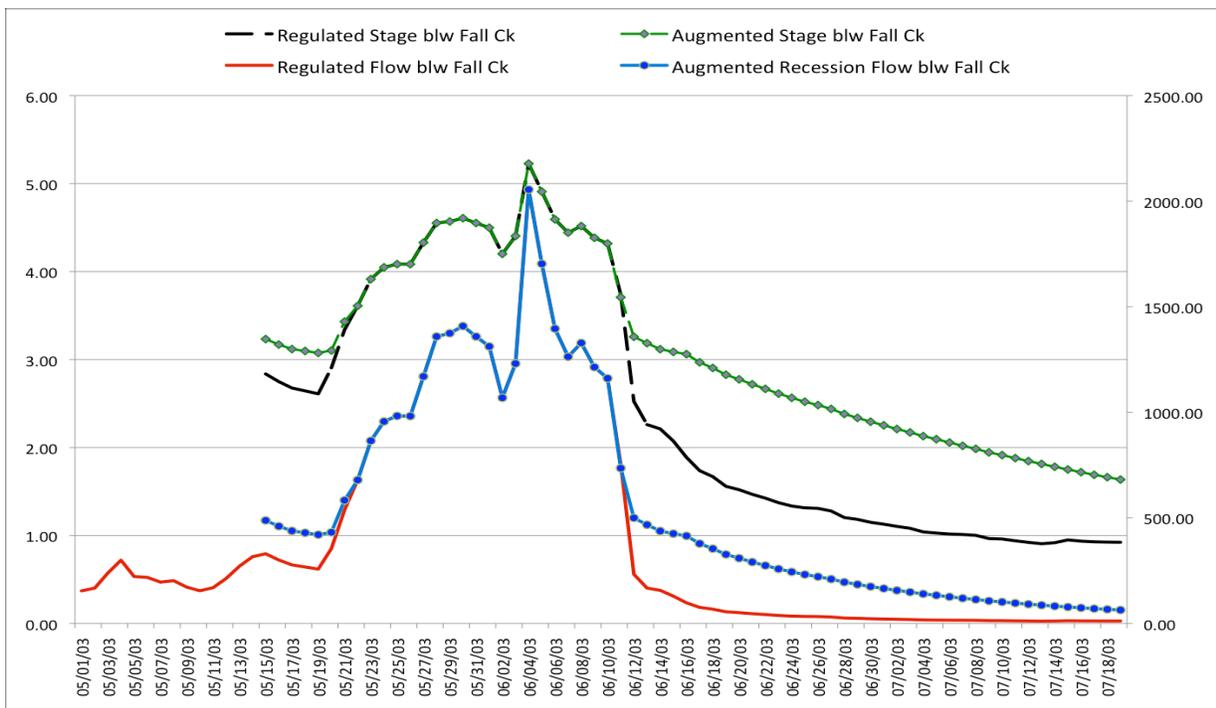


**Figure 4 – Comparison of Spaulding Reservoir Storage under Historic Regulated Operations and Regulated Snowmelt Recession Flow Scenario, 1999**

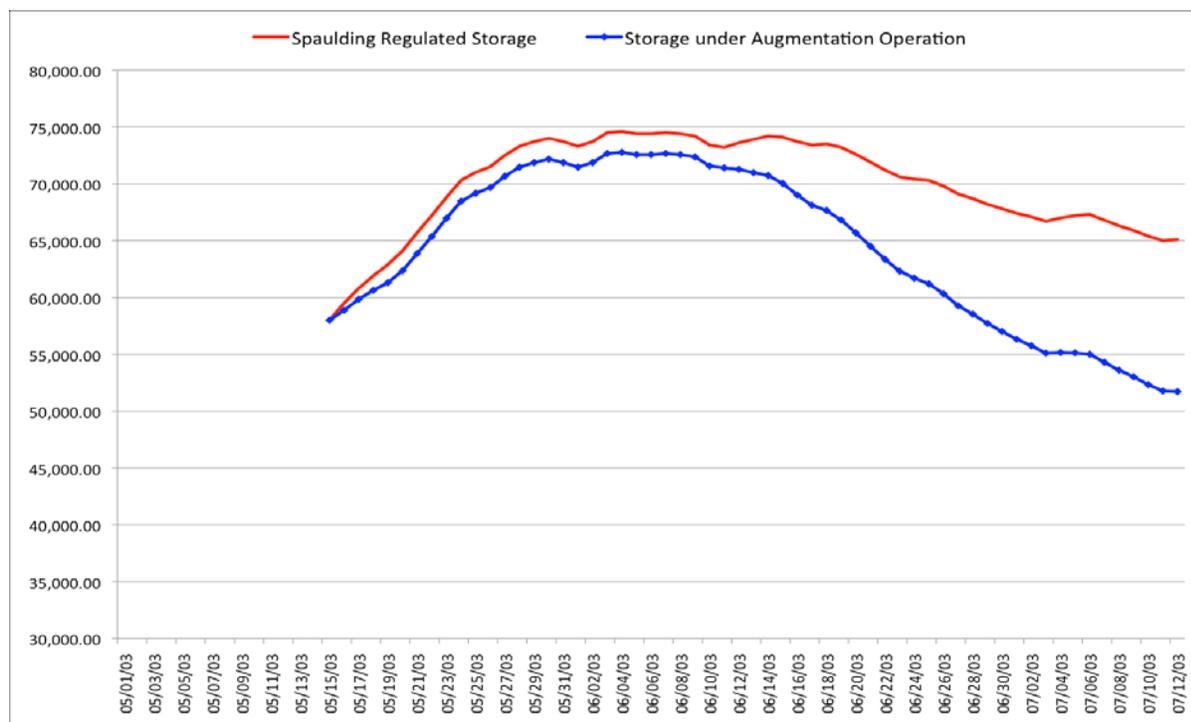


**Figure 5 Regulated Stage and Flow on South Yuba River below Confluence with Fall Creek, 2003 (Below Normal Water Year Type)**

**Regulated Snowmelt Recession Flow Scenario based on Base Flow = 200; Snowmelt Recession Starts = 400 cfs; Recession Rate = -5% / day**



**Figure 6 – Comparison of Spaulding Reservoir Storage under Historic Regulated Operations and Regulated Snowmelt Recession Flow Scenario, 2003**



### Sensitivity Analysis

In the above analysis of the Regulated Snowmelt Recession Flow Scenario in three water years, the -5% per day recession rate results in a stage recession of about -1’ in 3 weeks for all water year types at the 2D FLYF site. Setting the recession rate at -9%, and leaving the base flow and recession starting flow the same as in Table 1, results in a stage recession rate of about -1.5’ in three weeks at the 2D FLYF site. The following table compares differences in storage costs resulting from the two recession rates.

**Table 2 - Comparison of Recession Rates and Resulting Storage Costs**

Water Year	Water Year Type (Apr 1 Smartville)	Storage cost with recession rate = -5% / day	Storage cost with recession rate = -9% / day
97	Wet	11,866	7,301
99	Above Normal	5,477	0
03	Below Normal	13,381	9,100

## **Snowmelt Recession Flows as Precedent in Relicensings**

The analysis of the Regulated Snowmelt Recession Flow Scenario provided above, broadly demonstrates that together PG&E and NID can manage Spaulding Reservoir's spill flows to more closely resemble the unimpaired spring snowmelt recession. Most of the hydropower projects in California that have been relicensed, or are currently in the relicensing process, have included the concept of spring pulses and gradually receding flows that more closely mimic the natural hydrograph. These projects include: the amended flow schedule on the Cresta Reach the North Feather (P-1962), the final 4e flow conditions for the McCloud/Pit project (P-2107), the settlement agreement flows on the Big Creek project on the San Joaquin River (P.-2017), and most recently in the Draft License Application submitted by the Placer County Water Agency for its Middle Fork American River Project (P-2079). Flows that more closely mimic the spring snowmelt hydrograph have become a part of 21<sup>st</sup> Century flow development on hydropower projects up and down the west slope of the Sierra Nevada.

The Yuba-Bear / Drum-Spaulding relicensing participants have held several meetings to discuss this particular topic, however, there was not enough time to fully develop the appropriate measures before the deadline for the DLA. The licensees acknowledge this in both of their DLA's by stating,

Relicensing Participants – In some locations (e.g., the South Yuba River), Licensee considers the Minimum and Target Streamflows proposed above to be preliminary. Licensee is in the process of completing some studies, the results of which will be used to inform streamflow development...<sup>42</sup>

We look forward to working with the licensees to develop more appropriate measures for the FLA.

## **Snowmelt Recession Rate**

Recent analysis by scientists at University of California at Davis suggests that a 9% per day recession rate is the limit for flow changes that is protective of Foothill Yellow-Legged Frogs (FYLF).<sup>43</sup> Therefore, we recommend that PG&E and NID FLA's include measures that allow the snowmelt recession limb to recede at 9%/day on appropriate reaches.

We look forward to discussing identification of appropriate compliance points for recession rates in relation to Foothill Yellow-Legged Frog sites.

## **Water Source for Snowmelt Recession: Bear River Reach #2 Conveyance Flows**

In the previous analysis Spaulding Reservoir storage was drawn down to provide a snowmelt recession limb. This section will illustrate an approach whereby Spaulding reservoir storage can

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<sup>42</sup> Drum-Spaulding Draft License Application, Exhibit E7 p. E7-12.

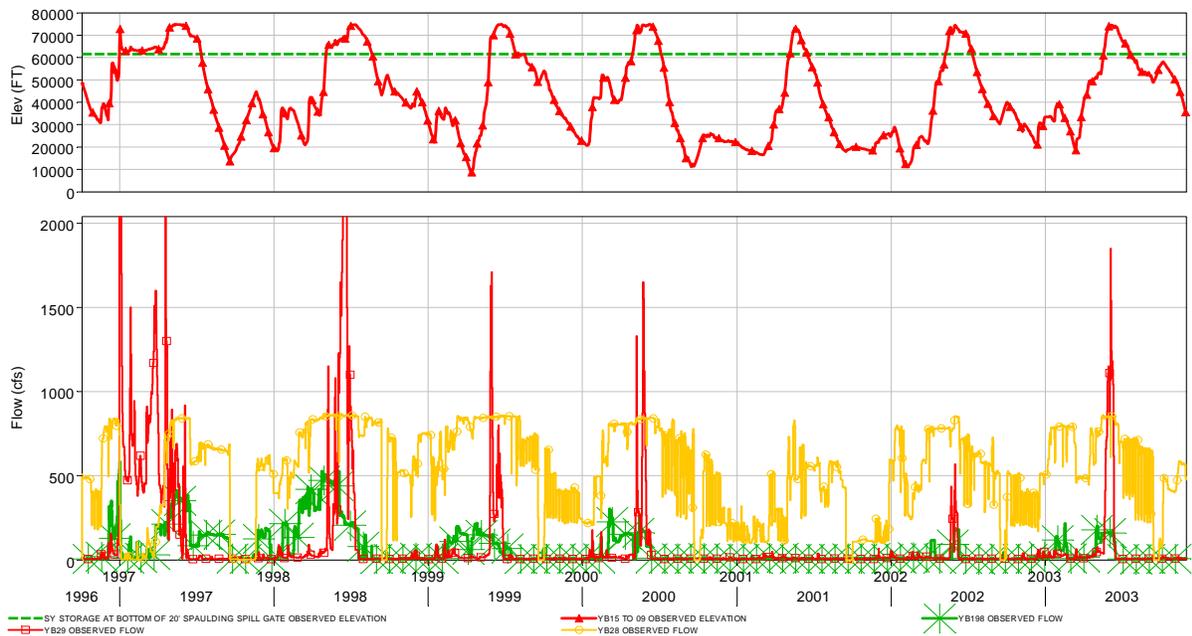
<sup>43</sup> Pers. comm, Dave Steindorf, American Whitewater with Sarah Yarnell, UC Davis.

be maintained at closer to historic “observed” levels, and the regulated snowmelt recession limb can be created, as well.

The top graph in Figure 7 shows Spaulding storage (the label says “Elev (ft)” but the numbers on the axis are storage in acre-feet). The dotted line is the lowest storage level—about 62,000 acre feet—at which water can be spilled from the three 20’ deep spill gates.

Comparing the flow at Lang’s Crossing (lower graph, red squares) with Spaulding storage, it appears that if Spaulding is going to spill, it spills as soon as water is “on the gates. Additionally, in all spill years, the Bear River through Bear Valley flows in the hundreds of cfs.

**Figure 7 - Spaulding Reservoir Storage, Lang’s Crossing Unimpaired Flow, Drum Canal Flow, and flow through Bear Valley.**

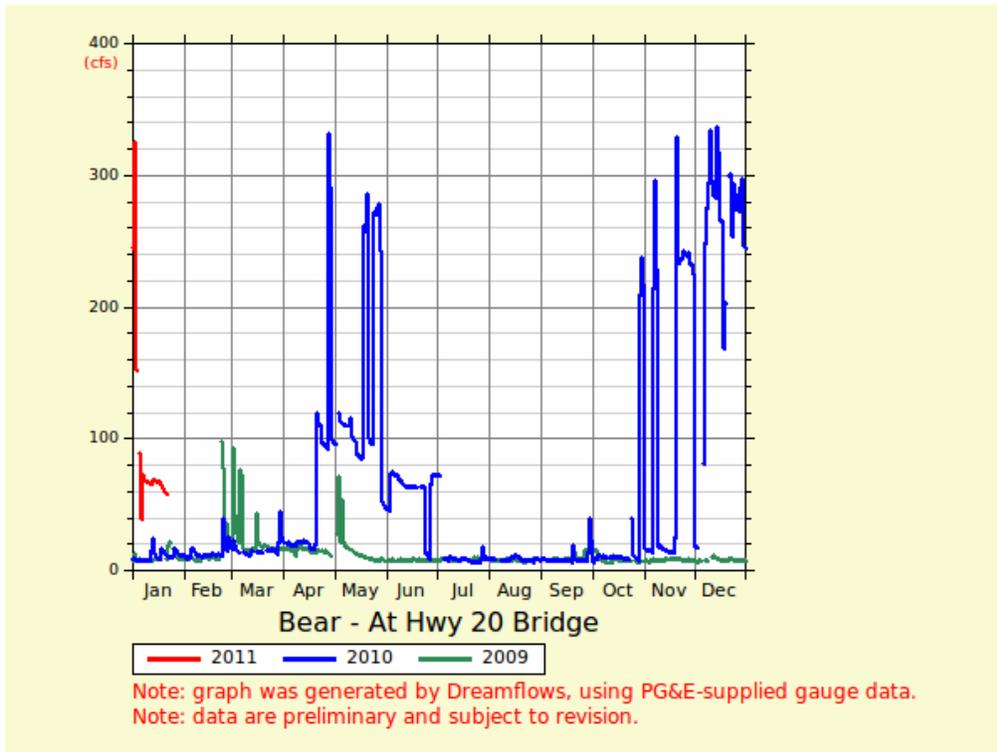


Legend		
Color	Point Style	Represents
Green	Dotted	Spaulding minimum storage for spill to be possible from 20’ gates
Red	Pyramid	Spaulding observed storage
Red	Square	Lang’s Crossing observed flow
Yellow	Circle	Drum Canal observed flow
Green	Cross	Bear River through Bear Valley observed flow

The years represented in the graphic were chosen to encompass the study years in the previous section, and also because the hydrology data set is complete through 2004, but not necessarily beyond.

This operation continues into 2011, as illustrated in the following graph:

**Figure 8 - Bear River Flows at Hwy 20 Bridge 2009-2011,**



The natural drainage in the Bear River above Highway 20 is a few hundred acres, and produces very little runoff. The Drum Canal has a capacity of about 800 cfs, limited by the inverted siphon through which the water flows just upstream of the Drum Forebay. Downstream of the Drum Afterbay, the combined capacity of the NID flume on river right, and the PG&E tunnel on river left, is about 1200 cfs. In all years in which Spaulding spills, the Licensees use the Bear River (Bear River Reach # 2 through Bear Valley below Highway 20) to make up for the capacity bottleneck created by the inverted siphon. The water thus run through the Bear Valley then is available to generate power in all of the power houses from Dutch Flat to Folsom Lake. Otherwise the water would be spilled at Milton, Bowman or Spaulding.

The flows illustrated in the above graphics have caused, and continue to cause, extensive damage in the reach, as illustrated by the cut-bank erosion in the following photograph, taken in a wooded reach on the Bear River upstream of Highway 20.

**Figure 9 Bear River Upstream of Hwy 20 (Bob Center 2007)**



Below Highway 20, PG&E leased the valley to the Van Vleck Cattle Company of Rancho Murietta CA from 1963 to 1993. Cattle were free to roam through the streambed.

**Figure 10 - Cattle in Bear Valley below Hwy 20 (pre-1993 during PG&E's cattle grazing operations)**



Churned up by cloven hooves, the alluvial soil was washed away and the stream—and tributaries-- cut down into the meadow, lowering the water table by as much as 10'. Much of what once was wet meadow populated by native plants and animals, and watered by a meandering brook containing native fish, is now semi-arid grassland dominated by non native annual grasses.

**Figure 11 - Bear River downstream of Hwy 20 (Bob Center 2007)**



In addition to the damage done to the river through Bear Valley, and to the valley itself, the diversion of the water in the first place from Middle Yuba, Canyon Creek and South Yuba damages those streams by reducing (springtime) flows. A more sound ecological approach, and a more balanced solution over-all, would be to divert less water from the Middle Yuba, Canyon Creek and South Yuba, and to eliminate the conveyance flows in the Bear Valley.

Elimination of the Bear Valley conveyance flows would allow Spaulding (and by extension, Bowman and Jackson Meadows) to remain fuller longer, while providing flows for the snowmelt recession in the Middle Yuba, Canyon Creek and the South Yuba, and would cease damaging the Bear Valley.

Spaulding Reservoir has three inputs: Bowman Spaulding Canal, Fordyce Creek and the Upper South Yuba. Two of these input flows—the Bowman Spaulding Canal and Fordyce Creek—can be controlled. The reservoir has three outputs: Drum Canal, South Yuba Canal, and release to the South Yuba River, all of which are controllable. Conveyance water is delivered to the Bear River from controllable gates on the Drum Canal and South Yuba Canal just above Highway 20. The complexity and controllability at and just below Spaulding Dam (and “up-canal” at Bowman Dam and Jackson Meadows / Milton), provides the foundation for significant flexibility of operation. This flexibility could be used to re-operate the project to substantially improve the aquatic habitat in four reaches: Middle Yuba, Canyon Creek, South Yuba and Bear Reach #2.

In 1997, the conveyance flows through Bear Valley from May 15 through June 30 totaled 30,984 af. Under the proposed operation the Bear Valley conveyance flow would be eliminated, and the 30,984 af would be returned to the rivers. The proposal is to return water to the rivers in proportion to the water that has been historically diverted from them. This results in returning about 65% of total diversion to the South Yuba basin. For 1997, this is 19,730 af. This amount of water more than makes up for the drawdown of Spaulding, resulting from creating the regulated snowmelt recession, noted in the previous section.

The following table applies this reasoning to Above Normal year 1999 and Below Normal year 2003, as well as to Wet year 1997.

Water Year	Average Conveyance Flow through Bear Valley, May 1 to June 30	Conveyance Acre Feet through Bear Valley, May 1 to June 30	South Yuba Basin portion of Conveyance Flow Returned to River	Spaulding draw-down resulting from creating regulated snowmelt hydrograph in previous section	Net Change to Spaulding Storage from Snowmelt Recession and Returned Conveyance Water
97	Wet	30,984	19,730	11,866	7,864
99	Above Normal	9,860	6,331	5,447	854
03	Below Normal	10,956	7,107	13,799	-6,692

From the table above, one can see that if the water historically conveyed into the Bear Valley were returned to the South Yuba River, it would more than make up for water required to shape a snowmelt recession in the South Yuba River in Wet and Above Normal water years. The returned water would also make a substantial contribution to the snowmelt recession even in Below Normal water years.

### **5.6 Planned and Emergency Outages**

PG&E and NID’s FLA should include a loading order for emergency outages, which prioritizes water deliveries.

For more comments on minimum instream flows during outages, please see specific stream reaches below: Auburn Ravine below Wise Powerhouse Overflow Reach.

### **5.7 Minimum Streamflows and their Measurement**

The PG&E and NID FLA’s should include minimum streamflows not target streamflows. The ‘target’ streamflows proposed in the DLA are unenforceable.

The PG&E and NID’s FLA’s should include minimum instream flow measurements based on the minimum instantaneous flow. This is a straightforward simple and enforceable approach. The FLA’s should not include the DLA proposal that minimum instantaneous flow in any one day shall be at least 80% of the mean daily flow for that day.

## **6 Flow Recommendations for Priority Specific Stream Reaches**

This section includes a group of priority stream reaches for which the Project should primarily manage to enhance and protect. The objectives for these priority stream reaches are also driving objectives for streamflows in river reaches upstream of them, in management of the conveyance facilities to them, and in infrastructure improvements to preserve cold water for them.

Within this section, the stream reaches are not sequenced according to priority but rather upstream to downstream according to the projects' water diversions and river flows.

The other stream reaches are grouped in Section 7. The licensees should consider the target objectives of the priority stream reaches when developing flow regimes for the other stream reaches grouped in Section 7.

It is important to note that we have written these comments without the benefit of fully completed studies and some study results that need to be revised. In particular, water temperature monitoring and modeling studies, Recreational Flow studies, Fish Passage study, and FYLF modeling studies will further inform our comments and recommendations for PG&E and NID's FLA's.

### **6.1 South Yuba River – Below Lake Spaulding Dam (PG&E)**

#### **Comments on Proposed Measures**

The Licensees state that, “In addition, 10 of 25 month-types under the Proposed Project provide greater than 100 percent of unimpaired WUA for adult rainbow trout. [for the South Yuba below Jordan Creek]”<sup>44</sup> One reason these instream flows are unsatisfactory is that the trout are experiencing less than 80% WUA conditions in other months in all year types; thus limiting their population.

#### **Resource Objectives**

- Enhance rainbow trout
- Enhance Foothill Yellow-Legged Frog
- Enhance whitewater boating
- Enhance recreational fishability
- Enhance habitat for Chinook salmon and steelhead reintroduction

#### **Measures and Rationale**

The PG&E FLA should include higher minimum instream flows than in the DLA.

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<sup>44</sup> PG&E Drum-Spaulding Draft License Application, Appendix E7 – Drum-Spaulding PM&E Measures, p. App. E7-14

The PG&E FLA should include minimum instream flows that meet the following temperature criteria:

Water Year Type	Months	Temperature	Compliance Point
Wet, AN, Below Normal, and Dry	July - September	19 degrees C average daily temperature	Humbug Creek confluence with South Yuba
Critically Dry and Extreme Critical Dry	July - September	19 degrees C average daily temperature	Poorman Creek confluence with the South Yuba River

The objective of these temperature criteria and their compliance points is to create contiguous habitat optimal for cold water fishes from the South Yuba River at its confluence with Fall Creek (first low/high barrier to upstream-migration) to downstream of Poorman Creek. This minimum distance is considered necessary to provide the capacity for a thriving and robust population in all years. In wetter years, the compliance point should be lower on the river to provide additional habitat.

Higher minimum instream flows should provide more cold water during summer and fall for rainbow trout rearing and holding as well as more cold water during spring for rainbow trout spawning. The minimum flows should also include more cold water for brown trout spawning in the fall.

Identification of higher minimum and snowmelt recession pulse flows should also be based on flows required for fish passage at the abandoned diversion dam at river mile 9.7, as well as low flow barriers at river miles 5.9 and 5.1 on the South Yuba River.

The FLA should include flows that mimic the shape of the spring snowmelt recession as discussed in Section 5.5 of these comments. In Critically Dry and Dry years, historic regulated hydrology show that water is on the gates every year except 1977. Therefore, historically, water has reached a high enough reservoir elevation early enough in the spring to indicate that the Project could open the gates at Spaulding to produce a spring snowmelt recession.

The YBDS Technical Memorandum 3-10 Aquatic Macroinvertebrate identifies South Yuba Reach #1 below Spaulding as the lowest IBI scoring of all project reaches; it received an IBI score of 17.<sup>45</sup> Minimum instream flows and mimicking the snowmelt recession should enhance Benthic Macroinvertebrate populations by increasing wetted perimeter and reducing desiccation of macroinvertebrates.

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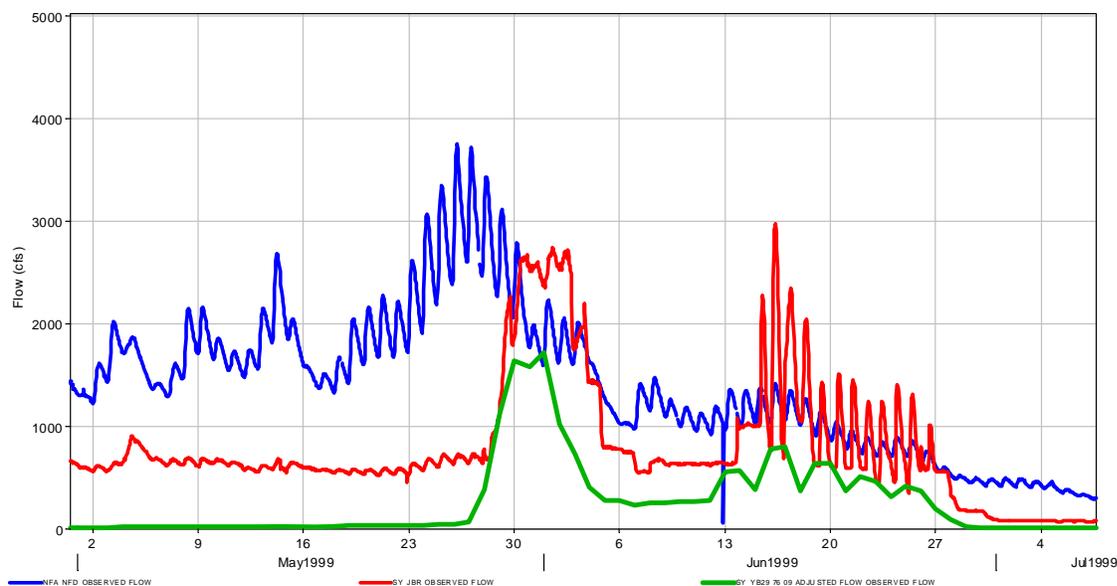
<sup>45</sup> YBDS Draft License Application, Technical Memorandum 3-10 Aquatic Macroinvertebrates p. 68

## ***Infrastructure Improvements and Deferred Maintenance***

The PG&E FLA should include three infrastructure improvements and complete deferred maintenance to Spaulding Reservoir and Dam, which will enhance the South Yuba River. These are 1) Improve automatic gate control at Spaulding Dam 2) increase capacity to release higher flows when water is not on the gates, and 3) Repair leaks on the face of or through the rock at Spaulding Saddle Dams to cool water temperatures in Jordan Creek and in turn, the South Yuba River.

First, the FLA should include an infrastructure improvement to improve the automatic gate controllers at Spaulding Reservoir. Currently the automatic gates appear to release spiky 15 minute spills that can wash away FYLF habitat, egg masses, macroinvertebrates, and trout roe. We surmise that the automatic gates could be over-controlling, which may be causing the spill pattern illustrated in Figure 11. The 15-min. hydrograph shows these spiky fluctuations but the average daily hydrograph does not.

**Figure 12 - Spaulding Reservoir 15-minute Flows 1999**



Second, the PG&E FLA should include the ability to release more than 16 cfs to the South Yuba when water is not on the gates for purposes such as pre-release prior to spill and to reconstruct the descending limb of the natural hydrograph.

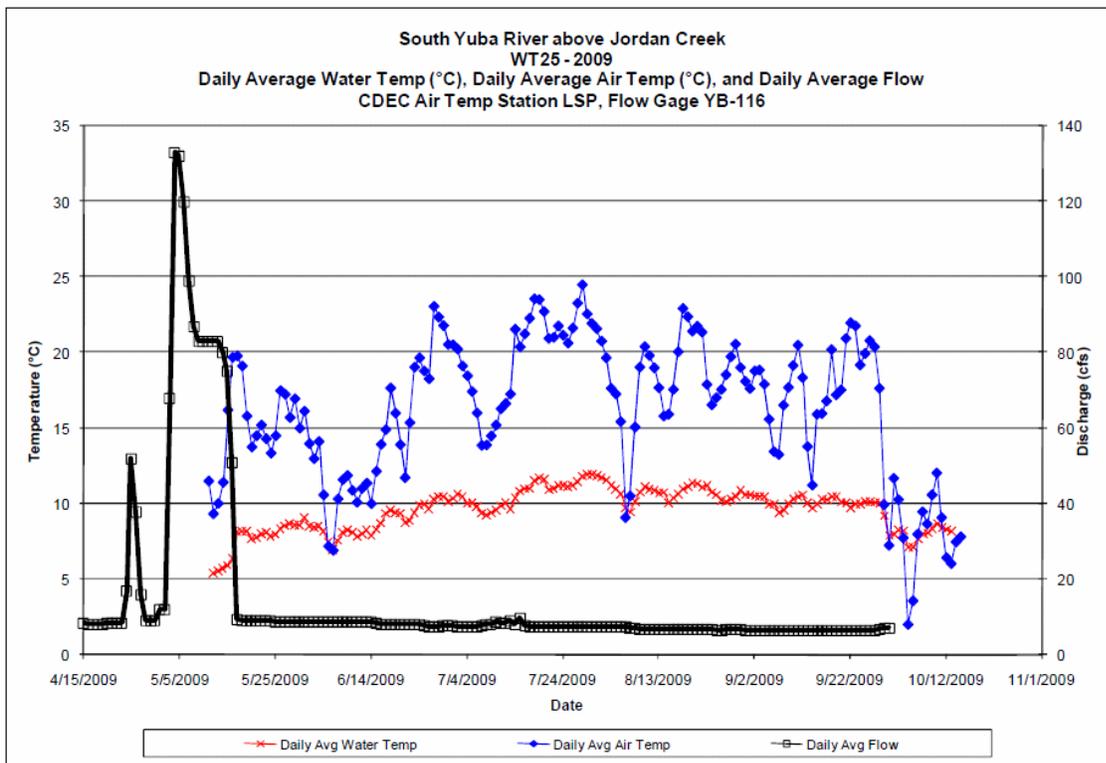
This improvement could be done through a variety of options:

- Repair the lower level outlet by removing upstream debris; installing Grizzly; repairing pipe as necessary; installing cone valve at downstream end to accommodate hundreds of cfs.
- Modification of power intakes and outlet below Spaulding #2 Power House to accommodate hundreds of cfs.
- Deepen the radial gates to allow for pre-release into the South Yuba River.

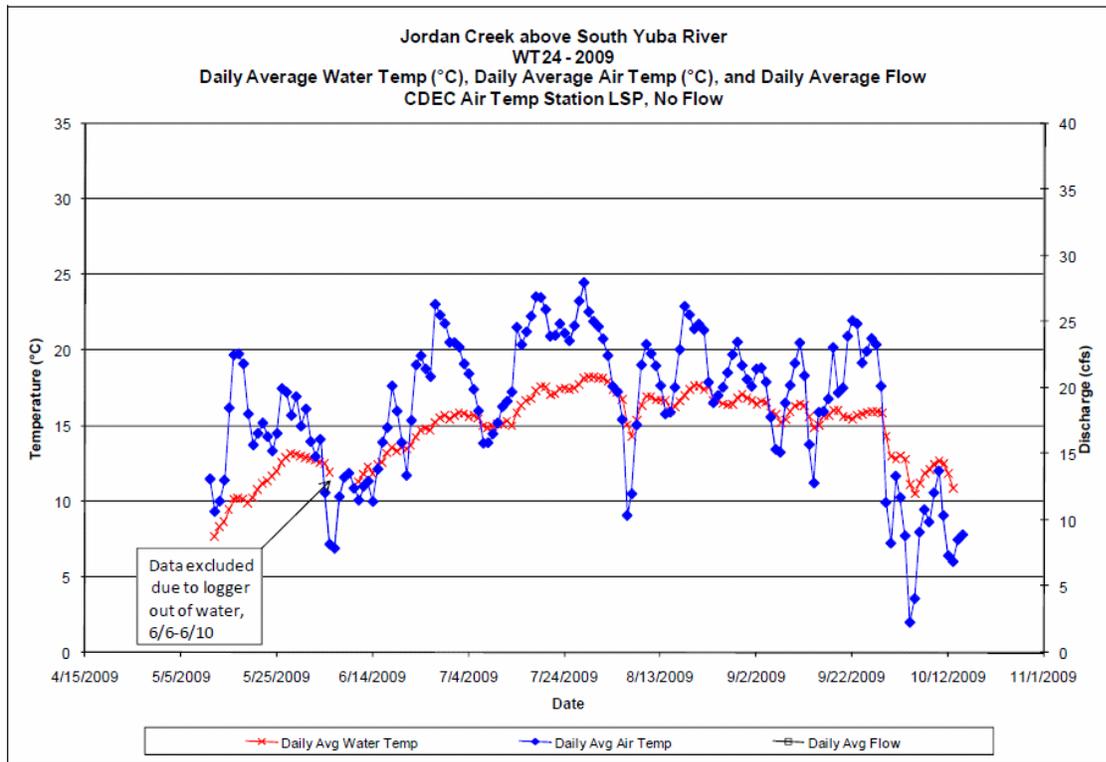
- Reduce water surface elevation in reservoir to allow for more spring capture and avoid spilling in springtime outside of the reconstructed spring snowmelt hydrograph. Pre-release from Spaulding Reservoir to avoid spills outside of spring snowmelt hydrograph to avoid washing out frog breeding and egg masses as well as trout roe and juveniles.

Third, the PG&E FLA should also include a proposal to repair the leaks on the face or through the rock of Spaulding Saddles Dam. As seen in the graphs below, a comparison of temperatures in Jordan Creek and South Yuba River show that Jordan Creek is quite a bit warmer. We hypothesize that the leak from Spaulding Dam's face into the Jordan Creek channel creates this temperature difference. The result is avoidable warming of the South Yuba River. By eliminating this temperature pollution plume, the project can cool water temperatures and enhance rainbow trout habitat in the South Yuba River downstream of Spaulding Reservoir.

**Figure 13 - Temperatures of the South Yuba River Above Jordan Creek 2009**



**Figure 14 - Temperatures of Jordan Creek Above South Yuba River 2009**



**Recreation Flows**

The Whitewater Boating Flow Study results were not available in time to integrate into these comments, precluding a consistent reach-by-reach discussion of boating flows. Please see Section 9.2 for a general discussion of the boating flow study, and section 5.5 which discusses the snowmelt hydrograph.

**Wild & Scenic Eligibility**

PG&E’s FLA should include flows that protect and are in keeping with the Wild& Scenic designation of the South Yuba River and its outstanding and remarkable values.

**6.2 Canyon Creek Below Bowman Dam and Bowman-Spaulling Conduit Diversion Dam Reach (NID)**

**FWN Objectives**

- Enhance rainbow trout
- Enhance shaded riverine habitat and reduce riparian encroachment
- Enhance recreational fishability
- Enhance FYLF
- Enhance Whitewater boating

Enhance habitat for Chinook salmon and steelhead reintroduction

### **Measures and Rationale**

The NID FLA should include higher minimum flows than those proposed in the DLA.

Increased minimum instream flows should meet the following temperature thresholds in Canyon Creek:

Water Year Type	Months	Temperature	Compliance Point
All water year types	July - September	19 degrees C average daily temperature	confluence with South Yuba

Increased minimum instream flows will enhance water temperature in Canyon Creek in order to cool water temperatures in the South Yuba for rainbow trout and reintroduction of Chinook salmon and steelhead. Increased instream flows should also increase wetted perimeter in Canyon Creek to provide more habitat for macroinvertebrates. The NID FLA instream flows should enhance rainbow trout spawning between mid-March through mid-July. Higher minimum instream flows should also enhance rainbow trout rearing and holding in the summer and fall.

Higher minimum instream flows in Canyon Creek should also be used to convey more and colder water to the South Yuba River and enhance rainbow trout refugia at the Canyon Creek confluence with South Yuba River. The Canyon Creek minimum instream flows in addition to higher minimum instream flows in those creeks below Bowman Canal should be combined to decrease temperatures in the South Yuba River. The degree to which Canyon Creek flows will provide this cooling function, as opposed to Fall Creek or other channels should be based on analysis of cold water pool management alternatives.

The FLA should include measures for Canyon Creek that provide a spring snowmelt recession rate as generally described in section 5.5 to enhance existing FYLF populations observed in FYLF VES Study Results on Canyon Creek below Texas Creek at RM1.2 Little Canyon Creek confluence (CC-1).<sup>46</sup>

### **Recreation Flows**

The Whitewater Boating Flow results were not available at the time of this study, precluding a consistent reach-by-reach discussion of boating flows. Please see section 9.2 of these comments for a general discussion of the boating flow study, and section 5.5 which discusses the snowmelt hydrograph.

To enhance fishability, Wet year summertime flows should be at least 25 cfs. In the summer of Dry and CD year types, summer flows should be at least 18 cfs. Network members, Frank Rinella, National Federation of Fly Fishers and Chris Shutes, California Sportfishing Protection Alliance, identified these as fishable flows when they fished the stream in the summer of 2009.

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<sup>46</sup> YBDS Draft License Application, Technical Study Memorandum 3-6 Special Status Amphibians, Foothill Yellow-Legged Frog Visual Encounter Surveys, p.22

The YBDS did not conduct an angling study of Canyon Creek. Rinella and Shutes fished Canyon Creek at 20 cfs, which they reported was not an adequate flow. They identified the optimum flow for recreational angling as 30 cfs. Recreational angling in Canyon Creek takes place between spring and fall as permitted by snow and access.<sup>47</sup>

### **6.3 Milton Diversion Dam Reach on the Middle Yuba River (NID)**

#### ***FWN Objectives***

Enhance rainbow trout;

Protect Foothill Yellow-Legged Frog

Preserve cold water pool in Milton for distribution in the summer and early fall to decrease temperatures in the Middle Yuba and for distribution to the South Yuba River to meet objectives in that reach.

Enhance habitat for Chinook salmon and steelhead reintroduction

#### ***Measures and Rationale***

The NID FLA should include higher instream flows for the Middle Yuba River below Milton Diversion Dam than those proposed in the DLA.

The NID FLA should develop a minimum instream flow measure for the Middle Yuba River below Milton that meets the following temperature criteria:

Water Year Type	Months	Temperature	Compliance Point
Wet, AN, Below Normal, and Dry	July - September	19 degrees C average daily temperature	5 miles downstream of Wolf Creek confluence with the Middle Yuba River
Critically Dry and Extreme Critical Dry	July - September	19 degrees C average daily temperature	Wolf Creek confluence

NID's FLA should include increased minimum flows in summer and early fall of all water year types to distribute cold water from the Milton Diversion low-level outlet to decrease temperatures and provide water in the warmest time of year when there is little to no accretion from the rest of the watershed to reduce stress on fish. NID's FLA should include increased minimum instream flows in CD and Dry year types to cool water temperatures and increase rainbow trout habitat to a point five miles below the confluence of Wolf Creek with the Middle Yuba River. In BN, AN, and Wet years types, NID should manage Milton Diversion to preserve

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<sup>47</sup> Personal Communication with Chris Shutes, California Sportfishing Protection Alliance, August 2010.

the cold water pool in the spring, when accretion downstream of Milton increases flows to desired levels to provide habitat.

The NID FLA should increase minimum instream flows to increase wetted perimeter in Upper Milton Diversion reach in order to enhance Macroinvertebrates. The YBDS Aquatic Macroinvertebrate Technical Memorandum reported a low IBI score of 26 at RM 43.6.<sup>48</sup>

Higher instream flows also inundate riparian vegetation and reduce riparian encroachment to enhance FYLF breeding sites on open cobble bars.

### ***Infrastructure Improvements***

NID agreed to install a fish screen at the Milton-Bowman Diversion. The Diversion may require multiple fish screens. The NID FLA should also discuss that Sackheim Consulting has a preliminary permit out on the out-take from Jackson Meadows and how a fish screen may affect that proposed project.

### ***Recreation Flows***

The Whitewater Boating Flow Study results were not available in time to integrate into these comments, precluding a consistent reach-by-reach discussion of boating flows. Please see section 9.2 of these comments for a general discussion of the boating flow study, and section 5.5 which discusses the snowmelt hydrograph.

## ***6.4 Bear River Reach Below Highway 20 Crossing (Bear Valley) (PG&E)***

### ***FWN Objectives***

- Enhance rainbow trout
- Protect brown trout in Meadow reach
- Enhance the meadow's proper functioning condition for natural water storage and release function and meadow flora and fauna
- Enhance tribal and cultural values of the meadow reach including enhancement of meadow function, flora, and fauna
- Enhance riparian, geomorphologic, and riparian function
- Enhance or protect Western Pond Turtle
- Enhance willow flycatcher

### ***Measures and Rationale***

The PG&E FLA should include a higher minimum instream flow and measures that will control the rate of increase and decrease of flow releases into Bear Valley. The PG&E FLA should include a higher minimum instream flow and propose a measure or combination of measures that avoids using the Bear Valley for conveyance.

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<sup>48</sup> YBDS Draft License Application, Technical Memorandum 3-10 Aquatic Macroinvertebrates, p. 56

YBDS Technical Memorandum 6-1, Riparian Habitat, characterizes the riparian-stream channel system as “Functional – At Risk, with an upward trend.”<sup>49</sup> While we agree that the Bear River Reach #2 site is recovering from a history of extensive land use including grazing, we believe the river in this reach lacks several important functions of a thriving river riparian system. The fundamental problem is that the channel remains greatly incised (between 3 and 12 feet) into the meadow throughout this reach and the Bear River is effectively cut off from its former floodplain on the meadow surface as shown in YBDS Riparian Habitat Technical Memorandum Attachment 6-1C Study Site Hydrology and Channel Morphology Summaries, Figures 2 through 5.

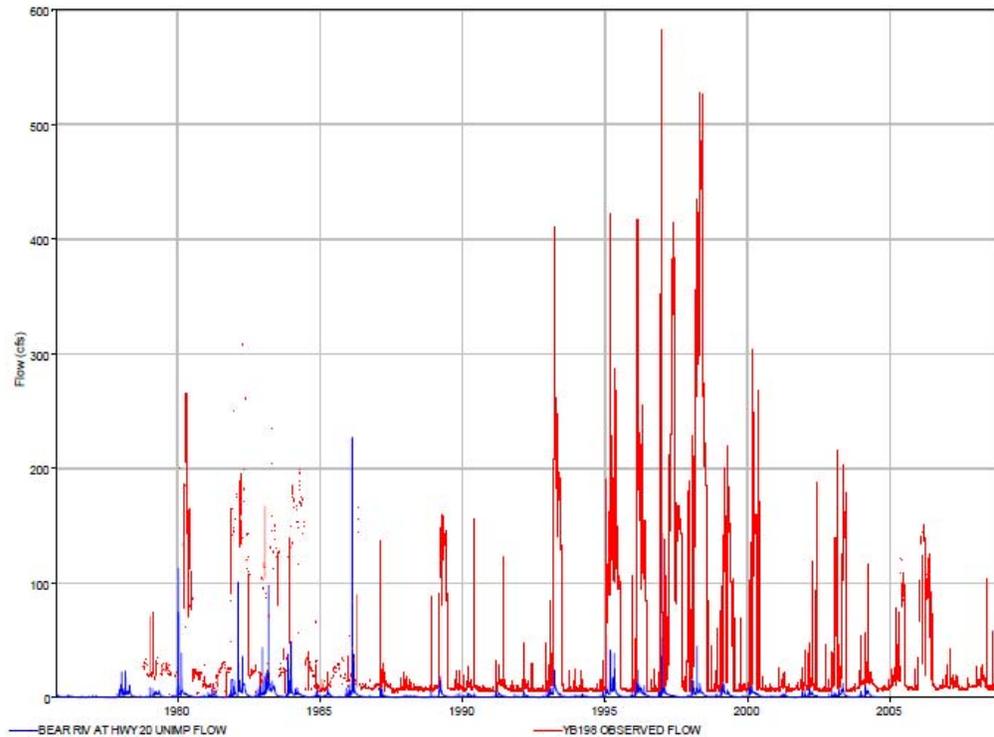
Tables 3.2-3 and 3.2-4 in Technical Memorandum 6-1 Riparian Habitat suggest that the Bear River in much of the meadow is functioning properly, with frequently inundated floodplains etc. However, this conclusion ignores that fact that the channel is greatly incised and cut off from its former floodplain, i.e., the meadow surface. The river has recreated small floodplain features within the confined, incised channel, but in most locations in this reach, the return frequency of flows of a magnitude adequate to inundate the meadow surface exceed 500 years. In other words, the meadow surface will effectively never be inundated again under current channel conditions.

As the Network has commented before, we believe current project operations exacerbate channel incision and unless modifications are made to operations and the channel itself, the Bear River in the Bear Valley meadow reach will not regain truly proper functioning condition. Current operations routinely result in spill flows that exceed the unimpaired peak flows by a factor of five, as shown below in the below Figure 10, which is a graph from YBDS Technical Memorandum 6-1 Riparian Habitat, Attachment 6-1C Study Site Hydrology and Channel Morphology Summaries.

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<sup>49</sup> Technical Memorandum 6-1, Riparian Habitat, page 40.

**Figure 15 Synthesized unimpaired and observed regulated flow in the Bear River at Highway 20.<sup>50</sup>**



**Figure 1. Synthesized unimpaired<sup>3</sup> and observed<sup>4</sup> regulated flow in the Bear River at Highway 20.**

As shown in Figure 1, the project regularly increases flows from 100 cfs or less up to 300 - 400 cfs, and occasionally greater than 500cfs down the valley with little to no up- or down-ramping (see graph from April and May 2010). The Foothills Water Network has commented on this issue in our Comments on the YBDS PAD<sup>51</sup>; Comments on the YBDS Study Report<sup>52</sup>; and in Comments on Revised Study Plan:

The following graph, from the Licensees' hydrology, illustrates the flows through the Bear Valley in blue, and the two primary sources of water for this reach: water from the Drum Canal in red, and water from the South Yuba Canal in green. The natural drainage above gauge YB198 is a few hundred acres, and produces very little runoff. The graphic below illustrates that the projects are responsible for frequent large magnitude flows inappropriate for the Bear Valley's channel size.

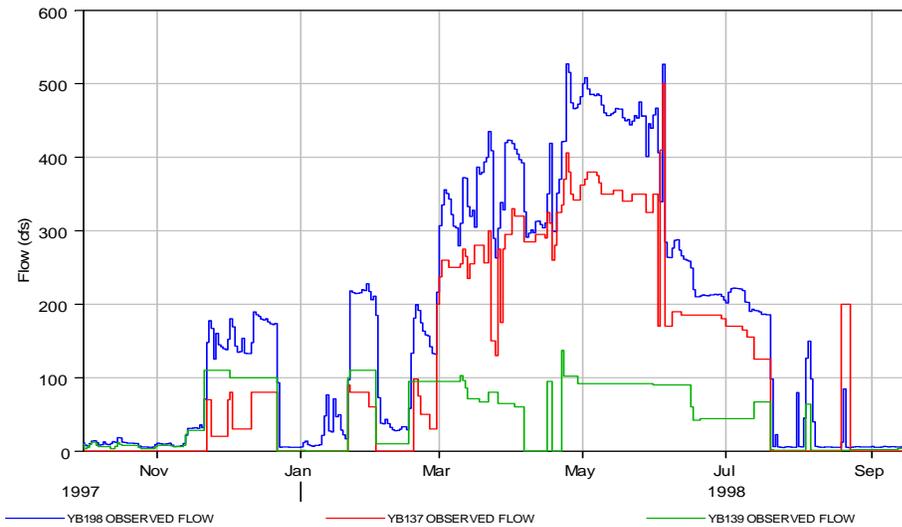
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<sup>50</sup> YBDS Riparian Habitat Technical Memorandum Attachment 6-1C Study Site Hydrology and Channel Morphology Summaries.

<sup>51</sup> Foothills Water Network Comments on PAD, dated August 10, 2008, p. 5

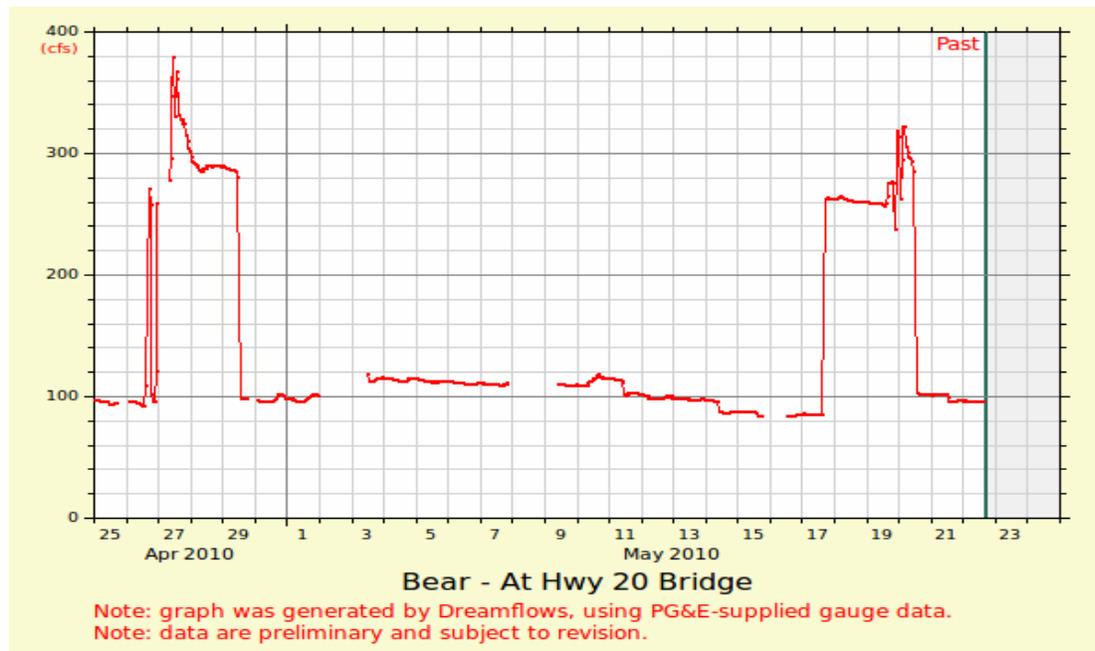
<sup>52</sup> Foothills Water Network Comments on Study Report, May 14, 2010, p. 17

**Figure 16 Flows on Bear River at Hwy 20 Bridge, 1997-1998**



The graphs above and below illustrate that the project significantly augments the natural flow in the Bear Valley. At times, PG&E uses the Bear River in Bear Valley as a conveyance reach to move water from the Yuba watershed through the YBDS hydropower system and not lose it down the South Yuba River, (See section 5.5 of these comments).<sup>53</sup> Again, the following graph below demonstrates extreme flows with inappropriately fast ramping rates.

**Figure 17 - Flows in Bear Valley at Hwy 20 Bridge, 2010**



<sup>53</sup> Foothills Water Network Comments on Revised Study Plan, February 9, 2010, p. 8

PG&E’s FLA should include a measure for post-licensing assessment and implementation options to restore the Bear River in the Bear Valley to a functioning meadow system. The assessment should consider a combination of measures to repair the channel in the Bear Valley meadow area, and control flow magnitudes and rates of flow changes. The assessment should analyze options including: streambank stabilization and revegetation, the “pond and plug” approach used to reconnect meadow streams to meadow floodplains,

### ***Ramping Rates in the Bear River Above Drum Afterbay***

The PG&E DLA includes a proposed ramping rate measure of 0.4 ft/hr maximum rate of stage change for the Bear Valley Above Drum Afterbay. The Network appreciates PG&E’s efforts to reduce project effects of rapid flow fluctuations in the Bear Valley. However, our main objective is to avoid use of this stream reach as conveyance and thus avoid the ongoing negative geomorphic impacts to Bear Valley. The use of this reach as conveyance limits the restoration opportunities in the Bear Valley.

The PG&E DLA proposes a ramping rate for “Bear River Above Drum Afterbay” in its proposed measures.<sup>54</sup> PG&E’s FLA should describe if and how PG&E’s proposed ramping rate will limit the magnitude of flows that are released into the Bear Valley and/or limit the volume of water diverted into the Bear for conveyance. The FLA should also describe operational changes required to meet this measure and the location at which the ramping rate would be measured above Drum Afterbay for compliance purposes.

### ***Recreation Flows***

The PG&E FLA flow measures should include minimum instream flows that enhance the angling experience in the Bear Valley, which is a popular fishing site. The Granite Bay Flycasters have invested in stabilizing banks to enhance the fishery through the Bear Valley but high flows have blown out the restoration project once so the club had to install the bank stabilization again.

## ***6.5 Bear River Below Drum Afterbay (PG&E)***

### ***FWN Objectives***

- Enhance rainbow trout
- Protect brown trout
- Protect Foothill Yellow-Legged Frog
- Enhance wilderness angling experience
- Enhance public access

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<sup>54</sup> Drum-Spaulding Draft License Application, Exhibit E7 p. E7-18 – E7-19

### ***Measures and Rationale***

The PG&E FLA should include higher minimum instream flows than those proposed in the DLA. The minimum instream flows should be based on analysis of weighted useable area curves for spawning and adult rainbow trout.

The PG&E FLA flow magnitudes and temperatures should protect FYLF below Drum Afterbay. The average daily temperatures in July and August are as low as 13-15 degrees C, which provides excellent thermal conditions for trout.

### ***Ramping Rate***

PG&E operations fluctuate flows too rapidly and too frequently below Drum Afterbay. This has negative impacts on aquatic biota. PG&E's FLA should include measures that protect aquatic biota in this reach by reducing the rate of flow changes.

### ***Recreation Flows***

The FLA's minimum instream flows should take into account the interest in wilderness angling on this reach.

## ***6.6 Bear River Below Dutch Flat Afterbay Dam (NID)***

### ***FWN Objectives***

Enhance rainbow trout  
Enhance riparian recruitment  
Enhance benthic macroinvertebrates

### ***Measures and Rationale***

The PG&E FLA should include higher minimum instream flows than those proposed in the DLA. The minimum instream flows should be based on analysis of weighted useable area curves for spawning and adult rainbow trout.

## ***6.7 Bear River Below Chicago Park Powerhouse (NID)***

### ***FWN Objectives***

Enhance Foothill Yellow-Legged Frogs  
Enhance rainbow trout  
Enhance benthic macroinvertebrates  
Enhance riparian vegetation  
Enhance fishability

## **Measures and Rationale**

NID proposes no Minimum or Target streamflow requirements in Bear River below Chicago Park Powerhouse other than the upstream minimum streamflow releases from Dutch Flat Afterbay Dam, which would flow past the powerhouse.<sup>55</sup>

NID's FLA should include higher minimum instream flows for this reach than proposed in the DLA in order to enhance rainbow trout life stages. The minimum instream flows should be based on analysis of weighted useable area curves for spawning and adult rainbow trout. The confluence of Steephollow Creek with the Bear River offers opportunity for rainbow trout refugia.

NID's FLA should include flows to enhance riparian recruitment to this reach. The streambed in this reach looks like a rocky channel devoid of plants, trees, and large boulders, woody debris. Flows should be developed in coordination with a Vegetation Management Plan for this reach.

## **6.8 Bear River Below Rollins (Bear River Canal Diversion Dam Reach) (NID)**

### **FWN Objectives**

- Enhance rainbow trout
- Reduce warm-water predator fish species in this reach, such as bass.
- Enhance coldwater fishery to meet SWRCB Basin Plan cold water designation
- Enhance benthic macroinvertebrates
- Protect Foothill Yellow-Legged Frogs at and below site BRC-2B
- Enhance fishability
- Enhance recreation access and experience
- Enhance whitewater boating

### **Measures and Rationale**

The NID FLA should include minimum instream flows for the Bear River below Rollins that are higher than those proposed in its DLA.

The minimum instream flows should meet the following temperature criteria to meet the SWRCB Basin Plan designation of this reach as a coldwater reach:

Water Year Type	Months	Temperature	Compliance Point
All Water Year Types	July - September	18 degrees C average daily temperature	To be determined

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<sup>55</sup> NID DLA, Exhibit E3 YB PM&E Measures, p. App. E3-11

The NID FLA minimum instream flows should increase winter flows from the proposed flows in the DLA. Minimum instream flows should increase as NID fills its storage in Rollins in order to avoid a large fluctuation from low minimum flows to high spills, which negatively impacts fisheries, aquatic biota, and early spawning.

Increase minimum flows will increase wetted perimeter to enhance benthic macroinvertebrates. The YBDS Technical Memorandum 3-10 Aquatic Macroinvertebrate reported low IBI score of 36 and MMI score of 26 for this reach. Some of the transects display inflection points where increased flow would greatly increase wetted perimeter at 60 cfs and 100-150 cfs.

It is our understanding that NID is currently operating this project to generate hydropower to meet power demands during heat waves. During the 2010 summer heat wave, NID met the heat wave demand and flushed 210 cfs down the Bear River below Rollins, which represented a steep increase from base flow. NID's FLA should include measures to ramp up to these high flows to avoid large fluctuations from low minimums to high flows, which negatively impact aquatic biota.

### ***Ramping Rate***

NID proposes stage change not to exceed 0.5 ft/hr as measured at YB-196 below Bear River Canal Diversion Dam Reach. Flows will be measured at 15-min. intervals. These rates are far faster than what is protective of FYLF.

### ***Recreation Flows***

The NID FLA should include year-round minimum instream flows that provide whitewater boating opportunities from Ben Taylor to Dog Bar Road (Class II). The Whitewater Boating Flow Study results were not available in time to integrate into these comments, precluding a consistent reach-by-reach discussion of boating flows. Please see section 9.2 of these comments for a general discussion of the boating flow study, and section 5.5 which discusses the snowmelt hydrograph.

## ***6.9 North Fork of the North Fork American River Below Lake Valley Reservoir Dam Reach and Lake Valley Diversion Dam Reach (PG&E)***

### ***FWN Objectives***

Enhance rainbow trout

Enhance recreational angling

Convey flows to PCWA American River Pump Station for pumping into Auburn Ravine during YBDS Project outages.

Protect Wild & Scenic outstanding remarkable values for which make the North Fork American eligible for Wild & Scenic

Protect and enhance habitat for reintroduction of Central Valley Steelhead into the North Fork American and its tributaries

## ***Measures and Rationale***

We do not agree with the rationale that “the proposed increased flows would make the streamflows in this reach consistent with those required below Lake Valley Canal Diversion Dam.” The mere fact that these low flows will match up with the low flows released upstream does not justify them. However, flow releases should grow as they move downstream to take into account accretion that is being impounded in each subsequent reservoir.

Summer minimum flows should be based on weighted useable area curves for adult rainbow trout (June – October). Sufficient storage should be maintained to increase winter flows to sustain over-wintering trout populations.

The PG&E FLA should include a discussion of the opportunity to release flows from Lake Valley down the North Fork of the North Fork American so that PCWA can pump them out of the North Fork American at the American River Pump Station and into Auburn Ravine during any YBDS outage period. This alternative is discussed in more detail in the comments on Auburn Ravine below.

## ***Infrastructure Improvements***

The FLA should include any infrastructure modifications needed to release water from Lake Valley to convey it to Auburn Ravine via the PCWA American River Pump Station during emergency and annual maintenance outages. This scenario for water transfer is discussed further in the stream reach for Auburn Ravine Below Wise Powerhouse Overflow Reach.

## ***Recreation Flows***

The Lake Valley Diversion Dam reach is important for stream fishing, and current streamflows are too low to support recreational angling and sustain a thriving fishery. Provide online real-time flow information to facilitate recreational angling on this reach.

## ***6.10 Auburn Ravine Below Wise Powerhouse Overflow Reach***

### ***Comment on Proposed Measure***

We recommend that PG&E’s FLA include a minimum instream flow and outage flow measures for Auburn Ravine below Wise Powerhouse. In its FLA, PG&E should fulfill FERC’s requirements to explain alternatives for outage flows and limitations for providing minimum instream flows for all times for the entire year other than the annual maintenance outage period. The FLA should include the alternative for different minimum instream flows from outage flows. The FLA should also include a description of how the proposed ramping rate will address public safety and impacts to the aquatic fisheries and macroinvertebrates related to fast up-ramping and down-ramping in the Auburn Ravine.

In FERC’s July 23, 2010 order in its Determination on Requests for Modifications to the Yuba-Bear, Drum-Spaulding, and Rollins Projects Study Plan, FERC staff stated:

Based on the information from Technical Memorandum 3-13, we preliminarily conclude that there is a nexus between the project and flows delivered to both the upper and lower reaches of Auburn Ravine--although the strength of the nexus is variable by season (study criteria 5). ... based on our review of the information, we find it appropriate and necessary for our environmental review that PG&E, in its preliminary licensing proposal (PLP), include a detailed description of the operations of the Wise powerhouse and associated canal systems, and the facility's operational capabilities and/or limitations for providing ramping rates, minimum instream flows, and attenuating spill flows to Auburn Ravine.<sup>56</sup>

However, in Appendix E9 (Wise Powerhouse Operations) to PG&E's DLA, PG&E stated that with existing facilities it could not provide minimum instream flows in Auburn Ravine during outages. And rather than discussing minimum flow in other (non-outage) times of the year, it used its present limitations during outages as a rationale to evade discussion of instream flows altogether.

PG&E's DLA also provided no alternatives for minimum instream flows during the outage period, such as facilities that it might build or modify to provide such flows. It also did not discuss any options to contract with other entities for the use of their facilities to provide such flow.

### ***FWN Objectives***

- Enhance rainbow trout
- Enhance Steelhead (including half-pounders)
- Enhance Fall-Run Chinook
- Enhance Benthic Macroinvertebrates
- Enhance recreational angling

### ***Measures and Rationale***

The PG&E FLA should include minimum instream flows for Auburn Ravine with a gauged compliance point at Wise YB259.

Rainbow trout in this reach need increased minimum flows. Current operations result in flows that drop to 2-3 cfs for days and sometimes weeks in the wintertime, as well as during spring. This is demonstrated by the graphs in Technical Memorandum 3-13 Western Placer County Streams, Attachment 3-13C Lower Auburn Ravine Hydrology and by a low flow event that occurred on April 8<sup>th</sup>, 2010. These low flow periods historically have not lasted very long, but they can be devastating for aquatic insect and fish populations in Auburn Ravine. In the non-irrigation season, the historic hydrology shows low flows of 1-3 cfs that dewater the reach below Wise Powerhouse.<sup>57</sup> In addition, extreme low flows during the annual maintenance and emergency outages strand and stress rainbow trout, fall-run Chinook, and steelhead.

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<sup>56</sup> FERC Determination on Requests for Modifications to the Yuba-Bear, Drum-Spaulding, and Rollins Projects Study Plan, July 23, 2010. p. 12

<sup>57</sup> YBDS Technical Memorandum 3-13 Western Placer County Streams, Attachment 3-13D Lower Auburn Ravine Hydrology.

Minimum flows in Auburn Ravine should be required in order to increase wetted perimeter for BMI and enhance food production for rainbow trout. The Aquatic Macroinvertebrate Technical Memo reports an IBI score of 33 and an MMI score of 32 in Auburn Ravine.<sup>58</sup> Dry Creek Conservancy and Montgomery Watson Harza compared BMI populations in specific stream reaches of the West Placer Creeks. BMI populations studied just below the mouth of PCWA's water delivery tunnel at RM 26.4 had an IBI rating of 40, right on the threshold between poor and fair.<sup>59</sup>

In practice, provision of year-round minimum flows to Auburn Ravine would require relatively little water, because the low flow periods are few (based on historic operations). There is a 3-4 week planned maintenance outage in the fall, and periodic low flow events that dip below 10 cfs in non-irrigation season. Low flows during the irrigation season are rare, except when facilities are down, or under unusual circumstances.

The PG&E FLA should also analyze the regulated historic hydrology. When Rollins Reservoir starts to fill in the winter and hits its flood curve, water must be released into the Bear River; that water is then lost to the Yuba-Bear and Drum-Spaulding Projects. It is likely that some water that might be used to meet minimum instream flows in Auburn Ravine would be either pre-released or re-directed spill water.

The PG&E FLA should include minimum instream flows for Auburn Ravine that are higher than 100% WUA for the stream reach of Auburn Ravine that is located directly downstream of Wise Powerhouse. From Wise Powerhouse to Ophir Tunnel Outlet, Auburn Ravine is entrenched and steep. The narrowness of the channel and high velocities artificially drive the WUA down because the PHABSIM model says that velocities get too high for fish. However, in this reach, fish live behind rocks and other obstacles that provide eddies and slow moving water. Below the Ophir Tunnel discharge point, Auburn Ravine is characterized by a more open channel; downstream of Ophir Tunnel, greater flow releases provide more habitat.

In early April, NID starts calling for PG&E water releases into Auburn Ravine for irrigation purposes, resulting in increasing flows during the spring and a peak during mid-summer. The PG&E FLA flow regime for the Auburn Ravine should rely on the higher spring irrigation flows to meet WUA for trout spawning.

The PG&E FLA should consider the best way to meet the interest of enhancing the fishery in relation to its high summertime irrigation flows. The FLA should include measures that limit washing away juvenile fish, foster public safety, and provide angling opportunities.

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<sup>58</sup> Technical Memorandum 3-10 Aquatic Macroinvertebrate, p. 59

<sup>59</sup> Report on Benthic Macroinvertebrate Data November 2007, Dry Creek Conservancy and Montgomery Watson and Harza.

## **Outages**

We recommend the PG&E FLA include minimum instream flows for Auburn Ravine during planned and emergency outages. Here, we offer a few options for consideration:

- 1) Maximize use of reservoir storage in Rock Creek Reservoir
- 2) Release PG&E water from Lake Valley Reservoir into the North Fork of the North Fork American River, thence to the North Fork American River, so that PCWA's American River Pump Station can pump that water into the Auburn Ravine between YB259 and YB132.

PG&E's FLA should include an analysis of the option for PG&E to divert water from Lake Valley Reservoir to the North Fork of the North Fork American River and then have Placer County Water Agency pump the water into Auburn Ravine via the American River Pump Station. This alternative might require some change to existing water rights, which PCWA has indicated a willingness to discuss.

The Network requests that FERC's NEPA document also analyze the options for PG&E to provide water to Auburn Ravine during the emergency and annual outages.

## **Ramping Rate**

We appreciate the fact that PG&E has proposed a ramping rate for Auburn Ravine during the non-irrigation season. At this time, we have not been able to evaluate if .5 ft/hr at flows below 80 cfs is sufficient to protect aquatic biota and for public safety. We look forward to reviewing this with the licensee in future discussions. However, it is our understanding that some of the safety concerns that justify a ramping rate occur during the irrigation season, when PG&E quickly releases large magnitudes of water from Wise Powerhouse.

The PG&E FLA should discuss why PG&E and NID cannot meet the ramping rate proposed for non-irrigation season during the irrigation season. The FLA should also include rationale for why the licensee can meet its proposed ramping rate for periods outside the irrigation season but not during irrigation season. If in fact PG&E is able to meet the same ramping rates during irrigation season that it has proposed for the non-irrigation season, then PG&E should do so.

## **Recreation Flows**

PG&E's FLA should include minimum instream flows that enhance recreational fishing on Auburn Ravine.

## **6.11 Rock Creek Below Rock Creek Diversion Dam and Dry Creek Below Halsey Afterbay Dam (PG&E)**

### ***FWN Objectives***

Enhance fishery

Enhance Macroinvertebrates

Enhance recreational angling

Enhance Central Valley Steelhead and Fall-run Chinook in downstream reaches of Coon Creek

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## **Rationale**

In Rock Creek, we recommend increasing minimum flows in order to increase wetted perimeter for BMI to enhance food production for rainbow trout. The YBDS Aquatic Macroinvertebrate Technical Memo reports low IBI score of 34 and MMI score of 36.

Similarly, in Dry Creek, we recommend increasing minimum flows in order to increase wetted perimeter for BMI to enhance food production for rainbow trout. The YBDS Aquatic Macroinvertebrate Technical Memo reports low IBI score of 21 and MMI score of 24.<sup>60</sup>

## **Recreation Flows**

PG&E's FLA Minimum instream flows in these reaches should take into account interest in recreational angling.

### **6.12 Mormon Ravine Below Newcastle Powerhouse**

PG&E does not propose any minimum instream flows in Mormon Ravine Below Newcastle Powerhouse. In the existing license, the minimum instream flow is 5 cfs. PG&E's FLA should propose maintaining the existing minimum flow of 5 cfs.

## **7 Reaches to be Managed for Downstream Objectives**

The PG&E and NID FLA's should include instream flows in the following reaches that are predominantly defined by the flow, temperature, and timing needs of the Middle Yuba River downstream of Milton Diversion and the South Yuba River downstream of Spaulding Reservoir. Minimum instream flows should of course also consider the aquatic and recreational resources within each reach.

### **7.1 Jackson Meadows Dam Reach (NID)**

#### ***FWN Objectives***

Enhance rainbow trout

Preserve the cold water pool for strategic application in Middle and South Yuba Rivers to enhance the fishery and ecosystem health

#### ***Measures and Rationale***

The Network recommends that PG&E's FLA propose minimum instream flows below Jackson Meadows Dam Reach that preserve the cold water pool and make strategic releases to suppress temperature and augment the magnitude of flows in the Middle Yuba and South Yuba below Spaulding Reservoir.

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<sup>60</sup> YBDS Aquatic Macroinvertebrate Technical Memo, p. 59

## **7.2 Canyon Creek Below French, Faucherie, and Sawmill Lake Dam Reaches (NID)**

### ***FWN Objectives***

Enhance Canyon Creek below Bowman Dam and Bowman-Spaulding Conduit Diversion Dam Reach so that Canyon Creek can cool water temperatures in the South Yuba River.

### ***Measures and Rationale***

The NID FLA should include minimum instream flows in these reaches that provide colder water to the South Yuba River below Spaulding Reservoir via Canyon Creek.

## **7.3 Texas, Fall, and Rucker Creeks Below Texas, Fall, and Rucker Creek Diversion Dams**

### ***FWN Objectives***

Enhance rainbow trout populations and general aquatic health  
Enhance macroinvertebrates  
Enhance rainbow trout populations in South Yuba River

### ***Measures and Rationale***

The NID FLA should include minimum instream flows for Texas, Fall, and Rucker Creeks that are higher than those proposed in the DLA. Re-watering these creeks will help restore riverine ecosystems and will also contribute to the ecosystem of the South Yuba River into which they flow. These creeks offer a variety of combinations for conveying cold water to the South Yuba River to meet the cold water temperature criteria. The NID FLA should discuss re-watering these creeks in terms of comprehensive watershed planning, describe model run outputs, and mechanics for meeting cold water standards in the South Yuba via flow releases from these individual diversion dams.

### ***Infrastructure Improvements***

The NID FLA should require any infrastructure improvements that are necessary to releasing minimum instream flows down these creeks below Bowman-Spaulding Diversion.

## **7.4 Clear and Trap Creeks Below Bowman-Spaulding Conduit (NID)**

NID proposes no Minimum or Target streamflow requirements in Clear or Trap Creeks below their diversions.

### ***FWN Objectives***

Enhance rainbow trout populations and general aquatic health  
Enhance macroinvertebrates  
Enhance rainbow trout populations in South Yuba River

## ***Measures and Rationale***

Minimum instream flows in Trap and Clear Creeks should be enough to avoid fish stranding as took place in 2010.<sup>61</sup> NID could release the minimum instream flow by cracking the diversion gate. The minimum instream flow should increase wetted perimeter, cool water temperatures to enhance rainbow trout populations, avoid fish stranding, and provide more cold water to South Yuba via an instream channel. Re-watering these creeks will help restore riverine ecosystems and will also contribute to the ecosystem of the South Yuba River into which they flow.

A minimum instream flow in Trap Creek would also enhance rainbow trout habitat at tributary junction with South Yuba for trout and salmon refuge. This is one of the deepest pools on the South Yuba River and provides cold water refugia for trout.

## ***7.5 Fordyce Creek – Below Fordyce Lake Dam (PG&E)***

### ***FWN Objectives***

- Enhance rainbow trout
- Enhance shaded riverine habitat and reduce riparian encroachment
- Enhance whitewater boating
- Enhance aquatic health in the South Yuba downstream of Spaulding Reservoir

### ***Measures and Rationale***

The Network recommends that PG&E's FLA manage flows below Fordyce Lake Dam to suppress temperature and augment the magnitude of flows in the South Yuba below Spaulding Reservoir.

### ***Infrastructure Improvements***

PG&E's FLA should include installation of a vehicle bridge over Fordyce River where the Sierra Trek Jeep Jamboree. The Project's spring and summer low flows have attracted off-highway vehicle recreation to cross Fordyce Creek. The resulting erosion, damage to the streambed, and degradation of water quality, riparian vegetation, and macroinvertebrates all provide rationale for a vehicle bridge crossing the river.

### ***Recreation Flows***

The Whitewater Boating Flow Study results were not available in time to integrate into these comments, precluding a consistent reach-by-reach discussion of boating flows. Please see section 9.2 of these comments for a general discussion of the boating flow study, and section 5.5 which discusses the snowmelt hydrograph.

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<sup>61</sup> Personal Communication with Frank Rinella, Northern California Federation of Fly Fishers. August 2010.

## **8 Other Proposed Flow Measures**

### **8.1 Water Year Type**

The Licensees should include a sixth water year type for Extreme Critical to encompass an extremely dry water year such as 1977.

### **8.2 Consecutive Dry Water Years**

The licensees propose that relicensing participants re-convene to renegotiate minimum instream flows during consecutive dry water year types in drought conditions. The Network recommends the licensees include an Extreme Critical Dry year in addition to its proposed five water year types. We recommend that 1977 be identified as an Extreme Critical Dry year in the period of record. The relicensing participants should negotiate minimum instream flows for Extreme Critical Dry years and include these as proposed measures in the license application. Deferral of these decisions to post-licensing is not an acceptable or good process, and may lead to decision-making that does not have the benefit of institutional knowledge of the projects and the relicensing.

### **8.3 Proposed Measure for Coordinated Operations Plan**

The Network appreciates the Licensees' DLA measure to develop a coordinated management plan for implementing flow-related measures.

### **8.4 Streamflow Measurement**

PG&E's proposed Streamflow Measurement measure does not meet the interests of the Foothills Water Network. As stated in our comments on Recreation and Online Real-Time Flow Information flow, the FLA should include measures to post real-time and historic 15-min. flow information online. The information should be provided to CDEC for posting, though we understand the licensees cannot make CDEC post it.

The Network agrees that the PG&E and NID license should have measures to reporting flows to USGS. However, reporting on an annual basis is totally unacceptable to the Foothills Water Network and does not meet our recreation interests or our interest in monitoring flows for adaptive management and license enforcement. The Network's interests are in real-time accessible flow information.

## **9 Recreation Plan**

### **9.1 Public Information**

#### **Online Real-Time Flow Information**

PG&E's FLA should include a condition that online gauge information will be 15-minute data. The condition should also say that both instantaneous and historical data should also be posted online. Recreation users and conservationists would like to have historical flow data to understand the long-term management of the watershed.

The online real-time gauge information should be made available to CDEC for posting also. Some flow websites such as dreamflows.com and recreationists use CDEC to track flows in many rivers.

#### **Gauges**

Through various processes PG&E and NID have made good progress in making flow information available to the public. In the past two years information from a dozen gauges has become available. These gauges should be included in the FLA.

The Network recommends that PG&E and NID's FLA's should schedule installation of gauges no later than the third year after license issuance. The PCWA DLA states that gauges will be installed as long as six years after the license issuance. Gauge installation and the resulting publicly available real-time online flow information is a top priority for the Network and its constituencies to support angling and whitewater boating and to generally improve public safety. The availability of real-time flow information allows anglers to check the flows suitability for angling, increasing the real-time opportunities for angling recreation. Likewise, whitewater boaters can check the real-time flow information provided by gauges to opportunistically take advantage of boatable flows resulting from spills and accretion.

#### **Weekly Flow Forecasting**

The Network requests that the Licensees' FLA's include a condition for weekly forecasting of flows on below Milton diversion, Bowman Reservoir, Spaulding Reservoir, Drum Afterbay, Dutch Flat Afterbay, and Rollins Reservoir to facilitate angler, boater, and trail crossing recreational use. It is our understanding that the Licensees provide predicted flows as submitted to the Cal ISO every week throughout the year. We understand that the electricity market is in constant flux, and can change the Licensees' operations. We suggest Licensees include a caveat with its weekly flow predictions that flows may not meet the predictions and can change without notice, but that Licensees will make a good faith effort to post changes to the flow predictions to the website as they become known.

This weekly service will provide information for anglers about when flows will rise, thereby ameliorating the safety issues involved in wading and angling activities (i.e., prevent anglers from becoming stranded on one or the other side of the river because of rising water). Forecasting will also notify anglers of prime angling opportunities. The weekly forecasting will also aid trail crossers in planning their equestrian rides and trail runs so they time their crossings

when the flow is appropriate. The forecasting will allow boaters to plan to take advantage of the flows provided to the Confluence and Mammoth Bar Runs a week in advance.

### ***Signs for Public Safety***

We recommend that Licensees work with the California Dept. of Parks and Recreation to develop signs to inform the general public about fluctuating water levels and the potential danger and that the Licensees' FLA include a condition that they will provide the appropriate signage.

The PG&E FLA should include real-time online flow information should be provided for Bear Valley. The PG&E FLA should also include installation of staff gauges and flow warning signs at the sections of the Bear Valley where anglers fish to provide warning and information as to sudden and high flow fluctuations.

## ***9.2 Opportunistic Whitewater Boating***

The licensees' FLA's should analyze the Proposed Action's boatable opportunity days created by: 1) reconstruction of the spring snowmelt recession limb on selected river reaches 2) summertime water conveyance on selected reaches, and 3) reaches with significant accretion that augments the release from a project facility upstream.

### ***Recommendations***

See the Snowmelt Recession section 5.5 of these comments for recommendations for whitewater boating opportunities

### ***Whitewater Boating Study Implementation and Results Demonstrate Opportunistic Boating Possibilities***

Implementation of the YBDS Technical Memorandum 8-1 Recreation Streamflows demonstrated that the licensees can provide whitewater boating opportunities without incurring much cost and without releasing additional water from any reservoirs. Equally as important, the implementation of whitewater boating flow studies showed that boaters can take advantage of flows provided for ecological purposes or operations purposes. This eliminates the need to provide stand-alone single-purpose whitewater boating flows because the licensees can provide boating opportunities with dual-purpose flows that also meet operations and ecological objectives.

Licensees conducted three types of recreational flow studies as follows:

- 1) Reaches with routine summertime water conveyance including Upper Canyon Creek and Fordyce Creek. Licensees conducted whitewater boating studies coincident with these water conveyance releases.
- 2) Reaches with extended periods of spill in 2010 including the South Yuba River below Spaulding Reservoir, Canyon Creek below Bowman, and Bear River below Rollins. Licensees conducted opportunistic whitewater boating studies coincident with the spring 2010 spills. In some cases, the licensees adjusted spill rates at the dam outlet works to provide a range of flows for boating studies.

3) Reaches with significant accretion that augmented the release from the dam to provide boating flows including the lower reaches of the Middle Yuba River and South Yuba River. The licensees conducted whitewater boating studies with releases from the dam augmented by accretion.

The YBDS Recreation Flow Studies produced acceptable results at minimal cost to the licensees. These studies provide the structure for provision of future boating opportunities under the future license. Implementation of the studies demonstrated that licensees can provide boating opportunities at minimal cost without releasing stand-alone whitewater boating flows.

Meeting the major objective, field studies provided good information regarding flow ranges and minimum acceptable flows for inflatable kayaks, hard shell kayaks and rafts. In addition, the study implementation and results revealed the operational context in which the licensees regulate flow and manage spill.

As is true of other key studies, the YBDS Recreation Flow Study Technical Memo has not been published at the time of our writing these comments. We expect that the results will further inform relicensing participants' discussion and the licensees' FLA's.

### **9.3 Recreation Access and Facilities**

#### ***Bear River Trail Parkway***

The Bear River Trail Parkway will be a 30.4 miles riverside trail starting at the headwaters of the Bear River in Bear Valley and ending at NID's Combie Reservoir. Many pieces of the trail exist informally now with good public access and enjoy considerable public use. The Bear River Trail Parkway will link the existing Bear River trails by building new trail sections on PG&E, NID, BLM, Placer County, and State Parks lands, with a few private parcel easements or acquisitions. Together, PG&E and NID's YBDS project lands provide an almost continuous corridor of riverfront lands from the Bear between Bear Valley and Combie Reservoir. See Appendix K for Bear River Trail Parkway Concept Maps. The maps show the current land ownership, existing trails, and conceptual new trail sections.

The PG&E and NID FLA's should include measures to support and invest in the Bear River Trail Parkway. Planners envision the Bear River Trail Parkway to be developed in stand-alone phases. Each section of trail that is built can provide a significant new recreation opportunity for the public for swimming, water play, inner-tubing, whitewater boating, angling, recreational gold panning, hiking, horseback riding and biking. Trail section phases will improve the existing informal public use with parking, sanitation facilities, recreational infrastructure and trail development and signage.

In addition to the Foothills Water Network, supporters of the trail concept include Nevada County Land Trust, Placer County Land Trust, Sierra Fund, equestrian and hiking groups, and other community groups.

It is our understanding that some of the lands in the FERC Project area are those of which PG&E would like to divest. PG&E has created the Pacific Forest and Watershed Lands Stewardship Council to manage the divestiture of those lands. However, at the current time, PG&E still retains the fee-title to these lands and is the operating manager of the land use as demonstrated by PG&E’s continued timber harvesting. Consequently, PG&E is responsible for making enhancements to the lands within the FERC boundary in the YBDS FERC relicensing. PG&E should not be able to use the divestiture process in order to avoid responsibility for the enhancements of those lands under the FERC re-licensing; this is especially important given the uncertainty of whether PG&E will be able to successfully divest these properties through the Stewardship Council process. It is our understanding that properties that are not divested remain in the ownership of PG&E.

Under current conditions, the Bear River offers little public access and recreation facilities despite its proximity to the I-80 corridor and high population and recreation centers such as Auburn, Grass Valley, Nevada City, Colfax, and Lake of the Pines. The Bear River Watershed is the most densely populated of major Sierra rivers, but has surprisingly little developed recreation. The only developed recreation is Placer County’s popular Bear River Campground, which has a network of trails, full campground facilities, and two group camps. A measure of the pent-up demand for recreation is the fact that when reservations for the two group camps open on the first day of each calendar year, the two group camps are fully reserved for the season within six hours of non-stop phone calls to County Parks.

Yet the Bear River corridor itself provides numerous and substantial open space and recreation opportunities. This is due to the land ownership pattern in the river corridor, which is dominated by PG&E, NID, Stewardship Council, BLM, and the State of California. The existing access points already receive a lot of informal public use; however, the lack of recreation infrastructure, unsafe parking on public roads, inadequate sanitation facilities and unsafe and unmarked trails greatly curtails the public’s ability to experience the resource.

The PG&E and NID FLA’s should include measures for the following proposed access, facilities, and trail related to their properties on the Bear River Trail Parkway. The proposed trail reach with its associated access and facilities are integral to the larger vision for the Bear River Trail Parkway. However, each trail section offers value on its own, which allows the developers to develop the trail in phases.

Trail Sections	Access, Facilities and Trail Development	Existing Values of each Potential Trail Section
Upper Bear Valley Trail Above Route 20	Extend existing trail from interpretive center to trailhead at Route 20, where parking is already in place	Developed recreation & information trail Developed parking for trailhead
Lower Bear Valley Trail Route 20 (Gauge 139) to Drum Afterbay	Locate and develop trail through meadow and link trail to Powerhouse Road at Drum Afterbay. A possible option is to connect to and improve the trail	Exceptionally rich in Native American and early homestead sites On Immigrant Trail Exceptionally good fishing

	along PG&E's abandoned Boardman canal; a trail already used by hikers. Good access (refer to PG&E and NID projects 2310 and 2266 Proposed Study Plan Amphibians/Aquatic Reptile surveys)	Exemplary ecosystem of High Sierra meadow Good potential for kayak boating.
Drum Afterbay dam to Dutch Flat Trail	Good access (refer to PG&E and NID projects 2310 and 2266 Proposed Study Plan Amphibians/Aquatic Reptile surveys) Pristine river reach. Powerhouse road (7 mi.) is already a much used bicycle and hiking. A hiking connector might be developed between Powerhouse Road and Dutch Flat afterbay. Public roads already connect Powerhouse road to Dutch Flat afterbay and Chicago Park forebay.	Good fishing potential Great bicycle road Good hiking
Dutch Flat Afterbay to Chicago Park Powerhouse Trail	Mixed public ownership on both sides of the river provide ample opportunity for connecting trails.	Dutch Flat to Chicago Park is much used by mountain bikers on the Nevada County side on existing network of dirt roads
Chicago Park Powerhouse to Rollins Reservoir Trail	Good access via paved public road. With riverine restoration, this stretch has great potential as a recreation fishery. Restoration could include trails on both sides of river. Public user services should be provided. This area is close to large residential areas, such as Chicago Park and Colfax.	Secret Town road is paved access from Interstate 80 and old State Hwy 40 to river at Chicago powerhouse Often used by bicyclists, motor cyclists, hikers Popular fishing
Bear River Canal Diversion to Combie Reservoir Trail	Reach 6 is described in five sub-reaches, below.	
Subreach 2 (upper 1.6 miles below Rollins).	This section has good access with a popular informal trail on the north side from Highway 174 to a swimming hole and fishing areas. Parking is available at the Highway 174 bridge;	This subreach is considered to provide the best fishing opportunities in the watershed. The area is used by anglers, swimmers, hikers and

	there are no sanitation facilities, or developed trails.	naturalists. There are historic sites and tribal cultural uses on this subreach.
Subreach 1 (8.8 miles). Includes Ben Taylor Road to Milk Ranch.	This subreach also has good access. There is a large informal parking area at Ben Taylor Road, . A connector trail could be developed on NID land to Ben Taylor area.	Ben Taylor to Milk Ranch is popular with boaters, tubers, recreational gold panning and anglers. The fishing is considered to be good in this area. The city of Colfax is nearby and the area is heavily used for recreation.
Bear River Campground/Milk Ranch Road to Dog Bar.	Excellent access from Milk Ranch Road and Plumtree Road. There are campground trails along the river and above the river on public lands. This area would provide ready access for handicap services.	The Bear River Campground section, providing camping sites next to the river, Two group camps Provides Class II floats and is often used by kayakers as a winter learning stretch. Popular for swimming, wading, fishing and gold panning Fishing is popular throughout the reach, and particularly good upstream from the campgrounds.
Bear River at Dog Bar Road/Bridge	Good access from both the Nevada and Placer county sides; however, Dog Bar Road has tight curves and is, in places, one lane. The bridge over the river is one lane as well. Parking used to be available but is no longer provided and as a consequence users of the very popular recreation spot park along the road, further jeopardizing public safety. Trails go both upstream and downstream from the bridge. There are no sanitation facilities.	Very popular for swimming, sun bathing, gold panning and fishing Dog Bar is a take out for Class II rafting and floating from Ben Taylor and Milk Ranch.
Dog Bar to Combie.	This stretch has limited public access and although it parallels a large residential area, receives little public use due to the lack of access.	If access and trails were available, the Combie section would provide fishing, swimming, hiking

	NID lands are nearly continuous between Dog Bar and Combie.	and equestrian opportunities for the nearby communities. Good Class II boating reach, but not publicly accessible at Combie.
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With the exception of the immediate area of the Bear River Campgrounds, there are no provisions for public recreation – no maintained trails, no sanitary stations, and no reserved parking. Although most of the present and potential public recreation uses of the Bear River corridor between Reach 2 and Reach 6 occur within the boundaries of the current FERC Yuba Bear/Drum Spaulding licenses, the licensees do not provide riverine recreation opportunities for the very large demand for public recreation along the Bear River.

The Bear River corridor offers an exceptional opportunity to meet the public demand for hiking and river recreation opportunities and these opportunities must be addressed in the relicensing.

**Canyon Creek Whitewater Boating Access**

There is a gate across the access trail installed by a private owner. The owner allowed boaters to open and close the gate themselves during the whitewater boating test flows; it is unclear if the owner really has ownership of the property, or a mining claim that gives him the right to a locked gate, etc. If the gate is closed, boaters can walk 1.5 (maybe more) miles from Golden Quartz Campground on the road that is upstream and river right from Washington. The PG&E and NID FLA should clarify the ownership of this land and access rights to inform future negotiation.

**10 Riparian Management Plan**

**10.1 Bear Reach #2 (Bear Valley)**

PG&E’s FLA should include a Riparian Management Plan as part of a larger Bear Valley Restoration Plan that restores geomorphic function to the Bear River in Bear Valley. The Riparian Management elements should include assessments and measures related to vegetation for restoration options for returning the Bear River to the meadow surface.

**10.2 Bear River Below Chicago Powerhouse**

The NID FLA should include a Riparian Management Plan for the Bear River Below Chicago Park Powerhouse. The Plan should assess and implement vegetative restoration options to increase canopy cover, woody debris, and fish refugia to improve the trout fishery in this reach.

**10.3 Canals**

The PG&E and NID Riparian Management Plans should also include measures to reduce the effects of over-topping canals, erosion on the sides of canals, and reduce the use of pesticide and fungicide harmful to fish in cleaning of the canals. As stated in Foothills Water Network Comments on the YBDS PAD, the licensees’

*Foothills Water Network Comments on PG&E’s Drum-Spaulding and NID’s Yuba-Bear Draft License Applications*

...practice of using herbicides to manage vegetation on the canal berms has negative impacts on the native vegetation. Herbicides kill all plants on canal berms, and leave bare soil exposed to winter storms causing erosion which destabilizes the canal sides, causing leaks, and public safety problems. Possible direct contamination of drinking water supplies in the canals as well as runoff and routing of contaminated sediment should be addressed. Alternative methods of mechanical management should be analyzed, which are already utilized by PG&E on some canal stretches where landowners have rejected herbicide use on their property.<sup>62</sup>

## **11 Sediment Management Plan**

The PG&E and NID FLA's should include Sediment Management Plans with measures to pass-through sediment at their dams to enhance geomorphologic function, reduce the cost and environmental damage of dredging, and preserve the capacity of the reservoirs. The Plans should address the existing infrastructure and any necessary improvements to provide passive sediment management. The Plan should also assess mercury accumulation behind the dams and how passive sediment management could avoid methylation of that mercury and its re-entering the streamflow. Alternatively, the Plan should discuss options for dredging the reservoirs, cleaning the sediment of mercury and depositing the sediment on banks downstream for high flow redistribution downstream.

### **11.1 Bear River Below Chicago Park Powerhouse**

The NID FLA Sediment Management Plan should include measures to restore geomorphic function in the Bear River Below Chicago Park Powerhouse.

### **11.2 Canals**

In addition, the FLA should include a full inventory of proposed maintenance deposition yards, their condition, status with relation to the property owners concerned, and remediation measures to assure no further damage or pollution results, and that a stable and sustainable condition has been achieved. As stated in Foothills Water Network Comments on YBDS PAD:

PG&E's standard maintenance practices include dredging their canals and depositing both sediment, refuse, and in some cases construction debris like broken concrete on the downhill side of their ditch, which in some cases have migrated to nearby creeks. The standard maintenance description should include where and how these materials will be handled. Major spills or conveyance of water under emergency circumstances have threatened the canal structures during the course of this past license period. These significant releases have left major

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<sup>62</sup> Foothills Water Network Comments on YBDS PAD, p. 7

deposits of soils in the canals, which PG&E then removed and left on lands adjacent to the canals. Sometimes PG&E improperly compacted or did not compact the sediment at all. These removed sediment deposits often contain thousands of cubic yards of material and are dug and left under emergency conditions without permission of property owners. Over time, the sediment deposits developed severe cracks and pose public safety problems. They also have damaged potential to private property, pose risk for sedimentation of adjacent downhill streams.

This is a particular problem on the PG&E Bear River Canal.<sup>63</sup>

## 12 Studies

YBDS licensees have been releasing new Technical Memorandum with study results over the past few months and will continue to release some outstanding study results as demonstrated by the licensees' recent study report status update reproduced below. The Network reserves the right to comment on the studies that have been released after the Initial Study Report and their relation to our Comments on the licensees' Draft License Applications.

In its December 20, 2010 filings of Revised Forecasted Dates for Completion of Some Studies, PG&E and NID predicted the following schedule.

### NID Revised Forecast

Study	NID's <b>REVISED</b> Forecasted Date to Complete Studies
Study 2.1.1, Channel Morphology	January 31, 2011
Study 2.2.3, Water Temperature Modeling	January 31, 2011
Study 2.3.7, Special-Status Amphibians – FYLF Habitat Modeling	January 31, 2011
Study 2.8.1, Recreation Flow	January 31, 2011

NID expects to complete Study 2.3.17, 2011 Dutch Flat No.2 Conduit Entrainment Netting by September 30, 2011; and Study 2.3.16, Fish Barriers by October 31, 2011 as forecasted in the NID DLA.

### PG&E Revised Forecast

Study	Licensees' <b>REVISED</b> Forecasted Date to Complete Remaining Studies
Study 2.1.1, Channel Morphology	January 31, 2011
Study 2.2.3, Water Temperature Modeling	January 31, 2011
Study 2.3.7, Special-Status Amphibians – FYLF Habitat Modeling	January 31, 2011
Study 2.8.1, Recreation Flow	January 31, 2011
Study 2.12.1a, Historic Properties for the Drum-Spaulding Project	January 31, 2011
Study 2.13.1a, Native American Traditional Cultural Properties for the Drum-Spaulding Project	April 15, 2011

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<sup>63</sup> Foothills Water Network Comments on YBDS PAD, p. 7

PG&E expects to complete Study 2.3.5, Fish Entrainment, and Study 2.3.17, 2011 Dutch Flat No. 2 Conduit Entrainment Netting, by September 30, 2011; and Study 2.3.16, Fish Barriers, by October 31, 2011 as forecasted in the PG&E DLA.

In particular, at the time of the filing of the NID and PG&E Draft License Applications and our Comments, key study results and modeling tools were not finalized and available for analysis of proposed alternatives compared to existing conditions. In particular, the DLA's and Comments on the DLA's would have benefited immeasurably from resolution of issues with the water balance model and completion of water temperature model. Without those tools, the DLA's and these Comments are incomplete.

The Network also reserves the right to comment on the Historic Properties Management Plan, which at this time we have not reviewed with our liaisons to the Native American community.

### **13 License Term**

PG&E and NID are requesting 50-year license terms. The Foothills Water Network does not see a basis for such a lengthy license term. However, we look forward to continuing negotiations with PG&E and will consider license term as part of those discussions.

Thank you for your consideration of these comments. Please contact Julie Leimbach, Coordinator, Foothills Water Network if you have questions at [julie@foothillswaternetwork.org](mailto:julie@foothillswaternetwork.org) or 530-622-8497.

Respectfully Submitted,

Foothills Water Network Yuba-Bear Work Group



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A handwritten signature in black ink on a grey rectangular background. The signature reads "Jack Sanchez".

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