



March 5, 2011

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

**Via Electronic Submittal**

**RE: COMMENTS ON PRE-APPLICATION DOCUMENT and STUDY REQUESTS  
FOR YUBA RIVER HYDROELECTRIC PROJECT (P-2246-058)**

Dear Secretary Bose:

The Foothills Water Network submits this letter in response to Yuba County Water Agency's Pre-Application Document for the Yuba River Hydroelectric Project (P-2246-058) filed on November 5, 2010.

**Foothills Water Network**

This response was jointly developed and has been signed by non-governmental organizations and by individuals participating in the Yuba River Hydroelectric Project Relicensing. The Foothills Water Network represents a broad group of non-governmental organizations and water resource stakeholders in the Yuba, Bear, and American River 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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- C. Spring Snowmelt Recession Dynamics with Application to the North Fork American and the North Fork Yuba Rivers by Gerhard Epke, Sarah Yarnell, and Josh Viers

## 1. Additional Information

The Foothills Water Network will submit additional information relevant to all listed resource areas on a CD.

## 2. Comments on PAD Section 8: YCWA Identified Issues Outside Scope That Should Be in Scope

In its PAD, YCWA characterized a number of issues as outside the scope of the relicensing. The Network disagrees with some of YCWA's scoping in its PAD and presents the following major issue as well as the specific section of the PAD and issue identifier.

### ***2.1 Inclusion of Englebright Dam and Reservoir***

YCWA's PAD incorrectly excludes Englebright Dam from the following issue based on a rationale that the dam is not part of the Project. The PAD states:

8.4.7 AR-21: Effect of the Project on fish due to restricted passage at USACE's Englebright Dam, New Bullards Bar Dam and Our House and Log Cabin diversion dams (YCWA PAD Section 8, p. 8-13)

In other words, YCWA argues that an assessment of the effects of Englebright Dam on anadromous fish passage is outside of the scope of relicensing. It does so based primarily on the fact that the Army Corps of Engineers owns the dam. We recognize that the Corps is responsible for the effects of Englebright. However, YCWA is also partially responsible for the effects of Englebright because: it is an integral part of YCWA's and PG&E's hydropower projects; it is the afterbay for the New Colgate Powerhouse in the Yuba River Project, and the forebay for the Narrows powerhouses in that Project and PG&E's, respectively, as described in detail below.

(Most of this analysis would be true for Pacific Gas and Electric Company's (PG&E) Narrows Project (P-1403), as well as for YCWA.)

### **Englebright Dam**

In 1934 Congress authorized the Army Corps to construct Englebright Dam for control of hydraulic mining debris. P.L. 74-409 (1934). As completed in 1941, Englebright has a storage capacity of 70,000 acre-feet. In 1938, Congress authorized the Secretary of War to enter into contracts for power development at Englebright “upon such conditions of delivery, use, and payment as he may approve.” P.L. 75-716 (1938).

The Army Corps has not constructed any power plant at Englebright. It does not have any recorded water right for operation of the dam for power generation or any other purpose<sup>1</sup>. Instead, as discussed below, the Army Corps has entered into formal legal arrangements with YCWA and PG&E for use of the federal facilities and storage of water in Englebright. Under the California Water Code, YCWA holds Water Licenses 5544 (A010282), 11565 (A005631), 11566 (A015205), and 11567 (A015563), which authorize the diversion of water at Englebright to its Narrows 2 powerhouse. PG&E holds Water License 6388 (A008794), which authorizes storage and diversion of water at Englebright to the Narrows 1 Powerhouse. The SWRCB found that YCWA operates Englebright as an afterbay for its New Colgate Powerhouse, and as a forebay for its Narrows 2 Powerhouse. *See* SWRCB, Revised Water Right Decision 1644 (2003) (RD-1644), 2003 WL 25920999 (2003), at \*18-19 (available at [www.waterboards.ca.gov/waterrights/board\\_decisions/adopted\\_orders/decisions/d1600\\_d1649/wrd1644revised.pdf](http://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1644revised.pdf)).

The dam structure does not have a low level outlet or any other device for controlled flow releases for any purpose. *See Yuba County Water Agency* (Order Amending License), 113 FERC ¶ 62,137, \*64,392 (2005). All flow releases, other than infrequent spills during flood events, occur through the penstocks which the licensees built and operate for their Narrows powerhouses downstream.

### **YCWA’s Use of Englebright for Power Production**

Flows for power generation, up to 3,500 cfs, are discharged from New Bullards Bar reservoir and then conveyed by tunnel and penstock to New Colgate Powerhouse, a peaking facility located 1.7 miles upstream of Englebright Reservoir. Englebright “... is used as the afterbay to the New Colgate hydroelectric powerhouse.” *Yuba County Water Agency* (2005 Amendment), *supra* at \*64,392. YCWA re-regulates its discharged peaking flows in Englebright for redirection to Narrows 2 Powerhouse. *Id.*

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<sup>1</sup> We have not located any such right in the SWRCB’s database of water rights, eWRIMS, or WestLaw Next’s database of water rights orders.

Narrows II Powerhouse (also known as “New Narrows” Powerhouse) is located just below Englebright Dam. YCWA draws up to 3,400 cfs from that reservoir, via an intake tower and then tunnel and penstock.

Project No. 2246 consists of ... All project works [including a] power pressure tunnel, designated New Narrows Power Tunnel extending about 1,600 feet from an intake structure on the right bank of the Yuba River immediately upstream from existing Englebright dam ... to the head of a 230-foot long steel Penstock of New Narrows Power Plant....

*Yuba County Water Agency* (1963 License), *supra*, Ordering ¶ B.(b)(7).

YCWA then re-diverts the flows discharged from Narrows 2 Powerhouse for agricultural and other consumptive uses. *See* SWRCB, Water Right Order 2008-0025 (May 20, 2008), § 2.4.2, p. 13 (amending RD-1644 and approving Lower Yuba Accord). The Brophy Diversion draws from the reservoir of the Daguerre Point Dam, 12.6 miles below Englebright Dam. Daguerre Point, also owned by the Army Corps, has a fishway.

Under its license, YCWA is required to provide minimum flows in the Lower Yuba. Pursuant to Article 33, the compliance locations are just below the Narrows 2 Powerhouse and at Daguerre Point’s fishway.

Based on these facts, under authority of Federal Power Act (FPA) section 18, 16 U.S.C. § 811, or FPA section 4(e), 16 U.S.C. § 797(e), or Clean Water Act section 401(a)(1), 33 U.S.C. § 1341(a)(1), a fishway for upstream or downstream passage may be required as a condition of licensee’s continued use of Englebright for storage and diversion of flow for power generation.

### **Scope of Licensing Jurisdiction**

Under FPA Part I, FERC has jurisdiction over any non-federal entity which constructs, operates, or maintains any dam or related work for power generation using (i) navigable and other waters subject to the Commerce Clause of the U.S. Constitution, (ii) waters on federal lands such as a National Forest, or (iii) “surplus waters” from any federal dam. 16 U.S.C. § 797(e). It is unlawful for any non-federal entity to operate such works absent a license. 16 U.S.C. § 817.

A license, however, is more than the project works, defined as “physical structures” (16 U.S.C. 796(12)). Each license must assure “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 of development.” 16 U.S.C. § 803(a) (emphasis added). A new license “cover[s] any *project or projects* covered by the original license.” 16 U.S.C. § 808(a) (emphasis

added). Under FPA section 3(11), “project” means the complete unit of development, both the project works and all other associated interests in land and water rights. 16 U.S.C. § 796(11).

### **1. Licensee**

The Federal Power Act regulates power generation by any individual, corporation, municipality or State. 16 U.S.C. §§ 817, 796(4). YCWA and PG&E, as non-federal entities, are licensees for the Yuba River and Narrows Projects, respectively.

Under general law, a license may not issue to, and FERC does not have jurisdiction over, any other federal entity which operates a dam or other facility for power generation. Thus, a license may not issue to the Army Corps for Englebright.

### **2. Project Works**

“Project works” means the “physical structures of a project.” 16 U.S.C. § 796(12). *See* FPA section 3(11), 16 U.S.C. § 796(11). The project means the “complete unit of development,” including “all storage, diverting or forebay reservoirs directly connected therewith...” 16 U.S.C. § 796(11). “While the Commission does not license facilities that are unrelated and only incidental to the power generation facilities, it must license all project works that are related to, and necessary for, power generation.” *Big Bear Area Regional Wastewater Agency*, 33 FERC ¶ 61,115 (1985).

As discussed in our comments on SD1, FERC generally omits federal facilities from the description of project works. Although the analysis set forth below does not depend on this conclusion, we believe this practice is legally incorrect. FPA section 3(11) expressly provides that a license must include any dam or other work used by a licensee for power generation. It does not carve out an exception for federal ownership, or more generally, ownership by any entity other than the licensee. We believe the new license should call Englebright what it is: a project work.

The next sub-section provides a more conservative basis for addressing Englebright in the new licenses for these projects.

### **3. Licensees’ Legal Interests in Englebright**

The new licenses for these projects must include the legal interests which the licensees hold to use Englebright as a facility, the lands it occupies, and the waters it stores. (We note that the original licenses each include, as project works, the intakes and tunnels that the licensees build and operate to direct flow from Englebright to their respective powerhouses, and all rights necessary to operate the project.)

### **4. Interests in Dam Operation**

Under general law, a license covers a “project,” which includes not only project works but also associated interests in land and water rights. Under FPA section 3(11), project means:

... complete unit of improvement or development, consisting of a powerhouse, all water conduits, all dams and appurtenant works and structures (including navigation structures) which are a part of said unit, and all storage, diverting or forebay reservoirs directly connected therewith, ... all miscellaneous structures used and useful in connection with said unit or any part thereof, and all water rights, rights-of-way, ditches, dams, reservoirs, lands, or interest in lands the use and occupancy of which are necessary or appropriate in the maintenance and operation of such unit ....

16 U.S.C. § 796(11).

If a dam used for power generation is owned by a non-licensee, the licensee must acquire an easement or other possessory interest sufficient to accomplish such generation and other project purposes, and generally to assure that FERC may carry out its obligations under FPA Part I. *Niagara Mohawk* (E.J. West), *supra* at 3; *New York State Electric & Gas Corporation*, 23 FERC ¶ 61,034 at 61,090 (1983).

The original licenses for these projects took this approach to Englebright. YCWA and PG&E were each directed to obtain from the Army Corps the necessary rights for use of Englebright<sup>2</sup>. For example, Article 47 of the original license for the Yuba River Project provides:

The Licensee shall enter into contractual arrangements with the [Corps] ... with respect to supplying storage for water in the Corps’ Englebright Reservoir for power development at the New Narrows Power Plant, upon such conditions of delivery, use and payment as the Secretary of the Army may approve, such payments to be deposited to the credit of the Englebright Reservoir.

As required by Article 47, YCWA entered into a contract with the Army Corps for the storage and diversion of flows at Englebright for use at its Narrows 2 Powerhouse, and for associated payments. *See* Contract No. DA-04-167-CIVENG-66-95 (1966). The Army Corps also granted an easement to YCWA for the construction, operation, and maintenance of a powerplant, intake, and tunnel “... over, across, in, and upon” federal lands, including those occupied by the reservoir. *See* “Easement for Right of Way,” No. DACW05-2-75-716 (1975). The Army Corps

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<sup>2</sup> It is not uncommon for licenses to require acquisition of new rights and interests. *See, e.g., Niagara Mohawk* (E.J. West), *supra*; *Idaho Power Company*, 108 FERC ¶ 61,129 (2004); *Avista Corporation*, 90 FERC ¶ 61,167 (2000).

entered into a contract (1994) with PG&E, and granted an easement (No. DACW05-9-95-604), to permit the utility to operate Englebright for the benefit of the Narrows 1 Powerhouse.

## **5. Water Rights**

A license must include all water rights used for power generation. Thus, the original license for YCWA's project includes, in addition to the property interests in Englebright and the National Forest lands, "other rights, the use or possession of which is necessary or appropriate" to the operation of the project. *Yuba County Water Agency (1963 License), supra*, Ordering ¶ B(c). As discussed above, YCWA and PG&E hold all of the water rights, and the Army Corps does not hold any, authorized under California law for the operation of Englebright.

## **6. Interests in Lands Occupied by the Dam and Reservoir**

A license must also include a licensee's interest (either easement or use authorization) in federal lands occupied by the project. While the federal owner, such as the Army Corps or Forest Service, retains fee title and is not subject to FERC's jurisdiction, the project boundary designated in the license incorporates these federal lands in recognition of the project's use and occupancy. The original license for Yuba River Project includes: "... all lands constituting the project area and enclosed by the project boundary or the limits of which are otherwise defined and/or interests in such lands necessary or appropriate for the purpose of the project, whether such lands or interests therein are owned or held by the applicant or by the United States ...." *Yuba County Water Agency (1963 License), supra*, Ordering ¶ B(a).

## **YCWA's Use of Englebright for Power Production**

The PAD states that the Corps operates Englebright, not YCWA. The Corps owns it, but the licensees operate its reservoir levels and releases. There are a few key facts that demonstrate the licensees operate the reservoir.

- The Corps does not hold any water rights for storage, re-regulation, diversion, or re-diversion of water at Englebright. The licensees do.
- The Corps does not own or operate any outlet for water at Englebright. The licensees do.
- The Corps does not exercise any day-to-day control over lake levels at Englebright. The licensees do.
- There are no gates or any other movable, operational structures associated with the dam other than the intakes constructed, owned and operated by the licensees.
- The Corps does not generate any power from the forebay created at Englebright. The licensees do.
- The Corps does not use Englebright as an afterbay. YCWA does, to re-regulate peaking flows from the New Colgate Powerhouse.
- The Yuba River does not flow through Englebright. It flows through the licensee's penstocks and powerhouses. (For a few days each year, it spills over the top of the dam.)

When the dam is not spilling, a salmonid attempting to move downstream or upstream with the water would be blocked or harmed by the power generation facilities as much as, or more than, the dam itself.

- The licensees make all operational decisions regarding releases from Englebright; subject to the limitation (as stated in their contracts with the Army Corps) that certain storage capacity is available in the fall to control floods flows. RD-1644, *supra* at \*11, 42, 77.

The Army Corps long ago recognized that power generation is the primary function of Englebright:

The reservoir is operated for hydraulic mining debris control and power generation. However, since project completion, there has been practically no upstream hydraulic mining activity, *consequently reservoir storage has been used entirely for power generation and for incidental recreation.*

(*Harry L. Englebright Lake Master Plan (1975)*, p.7 [emphasis added].)

The PAD also states that the Yuba River Project is not an integral part of Englebright Dam. For purposes of the Federal Power Act, the more relevant question is whether Englebright Dam and Reservoir is an integral part of the Yuba River Project.

### **The Licensees' Operation of Englebright for Power Generation Cause Impacts for Fish Passage**

Generally, a license must mitigate adverse environmental impacts caused by a project. This responsibility may arise from ownership of a dam or interests in lands and waters. *City of Tacoma v. FERC*, 460 F.3d 53, 65-69 (D.C. Cir. 2006). Thus, the license for a project using surplus water from a federal dam may properly require a fishway if the powerplant entrains fish. A license may also require a fishway if the project changes the volume or routing of flow releases from the federal dam in a manner detrimental to the fish resource, or otherwise has an impact on fish passage incremental to what the federal dam or operation otherwise causes. A license may not require changes in the design or operation of that dam in any manner that interferes with the federal agency's control or accomplishment of the non-power purpose.

As noted, the Army Corps does not control or operate any outlet from Englebright. Except when the dam spills during floods, all flow releases pass through the licensees' intakes and penstocks to the Narrows powerhouses. This routing through the powerhouses causes a risk of entrainment for all fish moving downstream. That risk exists only because Englebright is operated as a forebay for the projects.

Thus, under settled precedents, these licensees are responsible for mitigation of the adverse impact of entrainment incident to downstream passage of fish at Englebright. They exclusively control such passage.

The projects also worsen the blockage of upstream fish passage caused by Englebright. YCWA owns and operates New Bullards Bar, Our House, and Log Cabin dams, which block passage upstream of Englebright. Restoration of fish passage above mile 24 in the Yuba Basin is complicated by these other dams and YCWA's dependence on Englebright for power generation. Without these facilities, restoring fish passage above Englebright would be a relatively simple matter.

### **The State Water Board Has Already Concluded that YCWA is Partially Responsible for Impairment of Fish Passage at Englebright**

Several years ago, SWRCB rejected the same argument made in the PAD: that the Army Corps is solely responsible for the adverse impacts resulting from construction and continuing existence of Englebright. RD-1644, *supra*. The SWRCB required YCWA to release stored water from Englebright to protect downstream public trust resources, including fisheries. It found that such releases "partially mitigate" the adverse impacts of YCWA's use of Englebright for power and water supply purposes. RD-1644, *supra* at \*18. And it found that, for that same reason, YCWA is responsible for Englebright's blockage of fish passage, although RD-1644 did not itself reach what mitigation is appropriate for that impact. It reasoned as follows:

Englebright Dam and Daguerre Point Dam were incorporated into the design of, and are integral parts of, YCWA's Yuba River Development Project. Englebright Reservoir is jointly operated by YCWA and PG&E. (YCWA 2, p. 5, YCWA 3, p. 14.) The reservoir is operated as an afterbay for YCWA's Colgate Powerhouse and a forebay for YCWA's Narrows 2 Powerhouse and PG&E's Narrows 1 Powerhouse. Englebright Reservoir receives the widely fluctuating releases of water back into the Yuba River from the Colgate Powerhouse and allows YCWA to regulate its release of water for downstream irrigation deliveries.

Current operations of the Yuba River Development Project are dependent upon the continued presence of Englebright Reservoir which allows YCWA to regulate releases for downstream diversion at the three major diversion canals located near Daguerre Point Dam. Daguerre Point Dam serves as a diversion dam for the majority of the irrigation diversions under YCWA's permits.... Thus, although YCWA did not build Englebright Dam or Daguerre Point Dam, YCWA is involved in the ongoing operation of Englebright Reservoir, and both dams are integral parts of the project authorized by YCWA's water rights. The impacts of Englebright Dam and Daguerre Point Dam on Yuba River fisheries are not limited to past injuries at the time of construction. Rather, the impacts of the dams

are more accurately viewed as a continuing harm to the fishery. As long as the dams continue to block or impede free passage of anadromous fish, they continue to harm anadromous fisheries by preventing or impeding migration to upstream areas that provide spawning and rearing habitat formerly utilized by salmon and steelhead. Due to the dams and reservoirs on the Yuba River, fish that would otherwise be able to migrate to upstream habitat are now dependent on maintenance of suitable conditions downstream.

The extent to which a project developer may be required to provide mitigation for adverse effects on public trust resources caused by unrelated prior projects need not be decided in the present case. In this instance, YCWA benefits from, and participates in, the ongoing operation of previously constructed facilities that eliminate or reduce access to suitable upstream habitat for anadromous fish.

RD-1644, *supra* at \*18-19 (internal citations omitted).

The licenses for these projects must incorporate the water rights held by PG&E and YCWA. The SWRCB has definitively determined that operation of the Yuba River Project causes adverse impacts on the fisheries, including blockage of upstream passage. This conclusion will be controlling for the purpose of the SWRCB's water quality certification. While this conclusion does not directly control licensing conditions under FPA sections 4(e) and 18, we have not found any contrary precedent in administrative case law for the circumstance where (i) licensees exclusively operate a federal dam and (ii) power generation is the primary economic use of that dam.

### **Fish Passage For Salmonids is Within the Scope of the Proceeding**

Based on the facts stated above, fish passage at Englebright is squarely within the scope of this proceeding, and could be required by a number of agencies with mandatory conditioning authority. These include NMFS and FWS under Section 18, the Army Corps and Forest Service under Section 4(e), and the State Water Board under Clean Water Act Section 401.

It should be noted that fish passage is not only for anadromous fish such as salmon and steelhead. To be sure, those species have generated the most intense interest. However, fish passage for resident trout and other species should also be evaluated. In that regard, we point out that fish passage studies at New Bullards Bar, Our House, Log Cabin, and through the bypass and peaking reaches (including the effects of ramping rates and migration flows) must be considered; they are not affected by the question about Englebright.

### **Nomenclature**

In the PAD and other relicensing literature, the licensee and its consultant invariably refer to Englebright Dam and Englebright Reservoir as USACE Englebright Dam and USACE

Englebright Reservoir. This verbal manipulation has a constant message: this facility, and the passage of fish past it, is someone else's problem.

We recommend that the Commission change the terminology. We recommend that the Commission refer to Englebright Reservoir according to its use in the operation of the Yuba River Development Project: we recommend that the Commission refer to this reservoir as Englebright Afterbay and Forebay, per its used and useful purpose in the Project: it is the afterbay to Colgate Powerhouse, and the forebay to Narrows II Powerhouse (as well as to PG&E's Narrows #1 Powerhouse).

Englebright Reservoir is operated by the licensee. The Army Corps may have built it, but YCWA operates it.

## **2.2 Effects of Project on Flood Management**

Effects of the Project on flood management are within the scope of the relicensing because YCWA controls and operates New Bullards Bar and Englebright Afterbay according to ACOE flood control regulations.

In its PAD, YCWA claims that effects of the Project on Flood Management are outside the scope of the relicensing based on the rationale that a separate Field Working Agreement between the USACOE governs the Project's "use of storage allocated for flood control". In the PAD, YCWA states:

### 8.4.6 WR-15: Effect of the Project on flood management

The Field Working Agreement recognizes that YCWA, as owner and operator of the New Bullards Bar Reservoir, is responsible for normal operations and structural safety of the Project, and that USACE is responsible for the flood control operation plan of the dam and reservoir under Section 7 of the Flood Control Act of 1944.

(YCWA PAD Section 8, p. 8-12)

Though the ACOE may *administer* the flood control regulations, it is YCWA that *implements and controls* the operations of its New Bullards Bar Dam. Therefore, both ACOE and YCWA are responsible for flood control. The mere fact that two entities share the responsibility does not absolve either individual from its liability and does not disqualify this issue from the hydropower relicensing.

## **2.3 Effects of Project on Water Supply**

In the PAD, YCWA states:

8.4.4 WR-13: The Yuba River Development Project does not include agricultural or water supply ditches. Therefore, an assessment of such ditches and their operations is outside the scope of relicensing.  
(YCWA PAD Section 8, p. 8-12)

It is our understanding that the water supply demands are a dominant driver for YCWA's operations of the Yuba River Hydroelectric Project. Due to the issues of water supply demands, YCWA chose an Excel spreadsheet model, which could capture the downstream water demand driving the upstream reservoir operations rather than a HEC-RES model, which is based on reservoir operations.

On page 1 of the YCWA PAD, YCWA lists the benefits of the Project:

The primary benefits of the Project are:

- Flood Management – 170,000 acre-feet of seasonally dedicated flood space
- Fishery Enhancement – up to 574,000 acre-feet of water in instream flows for listed species
- Water Supply - irrigation supply for about 100,000 acres of productive farmland
- Hydroelectric Power Generation, including Ancillary Services - 395 megawatts of renewable energy capable of supplying electricity to up to 200,000 homes
- Recreation - over 60 miles of shoreline and 132 campsites, with over 100,000 recreation visitor days annually.

(YCWA PAD p. ES-1)

YCWA lists water supply as a major benefit of the Project and prioritizes water supply as a driver of hydropower operations of the Project. Therefore, the water supply aspects of the Project should be considered within the scope of the relicensing.

## **2.4 Effects of Project on Fish Passage at New Bullards Bar Dam, Our House Dam, Log Cabin Dam, and Englebright Dam**

The Yuba River is the largest river in the Central Valley without a hatchery, and supports populations of fall-run Chinook, late-fall-run Chinook, spring-run Chinook (listed as threatened per FESA, 1999) and steelhead. New Bullards Bar Dam, Our House Dam, Log Cabin Dam, and Englebright Dam completely block access to over 120 miles of historic spawning habitat (NMFS

has estimated that over 250 “intrinsic miles” of salmon habitat exist upstream of Englebright Reservoir). This habitat’s status designation as critical by NMFS was postponed pending the UYRSP’s results, research which has identified large stretches of suitable habitat in the Middle Yuba River above the New Colgate Afterbay.

## **2.5 Effects of Project on Anadromous Fish Habitat and Migrations Upstream of Englebright Dam**

YCWA asserts that because anadromous fish do not currently exist above Englebright Dam, then all considerations of their habitat in this area can be excluded from the relicensing. YCWA thereby excludes from the Project Scope the following issues as stated in the PAD:

- 8.4.9 AR-23: Effects of the Project on anadromous fish outmigration from New Bullards Bar Reservoir downstream due to changes in the timing and amount of flows
- 8.4.12 AR-26: Effect of the Project on fish passage, and potential enhancements for fall-run Chinook salmon
- 8.4.13 T&E-6: Effect of the Project on anadromous fish attraction and migration flows due to releases from New Bullards Bar Dam
- 8.4.14 T&E-7: Effect of the Project on anadromous fish outmigration flow and timing due to releases from New Bullards Bar Dam
- 8.4.15 T&E-8: Effect of the Project on spring-run Chinook salmon and steelhead due to migration barriers
- 8.4.16 T&E-9: Effect of the Project on spring-run Chinook salmon, steelhead and North American green sturgeon due to migration barriers at USACE’s Englebright Dam, New Bullards Bar Dam, Our House Diversion Dam and Log Cabin Diversion Dam

These issues should not be excluded from this relicensing because Englebright should be considered part of the Project and is subject to fishway prescriptions based on the rationale stated in section 2.1 of these comments. We also argue that the above issues are within the scope because anadromous fish reintroduction above Englebright Dam is reasonable and foreseeable in the near future (see Fisheries section below), certainly within the expected duration of a new project license.

The likely (estimated) upstream extents of Chinook migrations are:

North Yuba River – RM 50.8; Loves Falls.

Middle Yuba River – RM 34.5, where a large landslide creates a barrier more than 10 feet high (at low flow), which is probably also a high-flow barrier.

South Yuba River – RM 35.4, where a natural gradient feature consists of two falls, 13 feet and 7.5 feet high.

YCWA's management of New Bullards Bar Dam and New Colgate's Afterbay regulated at Narrows II contributes to fish mortality prior to spawning. Juveniles can be sucked through turbines, and become prone to predation at spillover sites; adults can be confused and misled by immense cold water flows from turbines at the New Colgate Afterbay, regulated by the Narrows #II outlet, and at the New Colgate Powerhouse outlet.

Flows from these outlets exceed instream flows by orders of magnitude. The New Colgate Powerhouse penstock and tunnel, with water diverted from New Bullards Bar Dam, has a maximum flow capacity of 3,500 cfs, and typically experiences a 2,600 cfs flow, while the North Yuba River flows out of New Bullards Bar Dam and into the riverbed at 5 cfs. The outlet for New Colgate's Afterbay at Narrows II powerhouse is rated at 3,400 cfs, and typically experiences flows of hundreds of cfs, yet no outlet exists its dam.

It is vital that we understand the impacts of flow regimes at these outlets to out- and in-migration of anadromous species.

## **2.6 Effects of the Project on Wild Trout**

The Foothills Water Network members disagree with YCWA's PAD statement that the following effects are outside the Project scope:

8.4.11 AR-25: Effects of the Project on wild trout (e.g., effects due to introduction of hatchery fish from Englebright Reservoir during spills) (YCWA PAD Section 8, p. 8-15)

For the reasons stated in sections 2.1, 2.4 and 2.5 regarding anadromous fish passage at Englebright Dam, we disagree. A fish moving downstream toward Englebright Reservoir might pass through the YCWA Narrows II Powerhouse. In addition, YCWA's storage and water release practices from New Bullards Bar affect the timing of spills at Englebright Reservoir, which might further carry fish over the dam into the Lower Yuba.

In addition, the Project regulated flows degrade wild trout habitat. For example, operations at Our House Dam divert flow out of the Middle Yuba, resulting in degrading wild trout habitat.

The Project's dams, afterbays, and diversions including Our House, New Bullards Bar, Log Cabin, and Englebright Afterbay all are barriers to wild trout migration upstream and downstream. The barriers pose risks for entrainment of wild trout.

### **3 Comments YCWA PAD Section 9: Proposed License Measures**

In its PAD Section 9, YCWA proposes new license measures. The licensee should include measures that address the following issues:

- Licensee will form an agreement with ACOE for planning and implementation of anadromous fish passage at Englebright Afterbay.
- Licensee will form an agreement with NMFS for all permits and implementation for reintroduction of anadromous fish above Englebright, New Bullards and Our House Dams.
- Licensee will route flows augmented by releases from Yuba-Bear / Drum-Spaulding Project facilities through YRDP facilities without diversion at Our House Dam or alteration of timing and magnitude of those flows at Our House Dam on the Middle Yuba River.

### **4 Comments on PAD Characterization of Resource Issues**

#### **4.1 Fisheries**

Dams and the alteration the magnitude and timing of flows are the key factors controlling fish population and distribution in the Yuba River watershed. While the PAD provides significant information on certain aspects Yuba River fishes, it does not adequately characterize the impacts on fish populations from the following project features:

Fish passage impediments:

- Our House Dam on Middle Yuba
- Log Cabin Dam on Oregon Creek
- New Bullards Bar Dam on the North Yuba
- New Colgate operations on fish of the mainstem Yuba River
- Englebright Dam (Narrows 2 Forebay) on mainstem Yuba River

Inadequate Minimum flows that degrade fish habitat in these Project reaches:

- Middle Yuba below Our House Dam
- Oregon Creek below Log Cabin Dam
- Middle Yuba below Oregon Creek confluence
- North Yuba below New Bullards Bar Dam
- Mainstem Yuba below North-Middle Yuba confluence

### **Project Effects on Water Temperature Affecting Fisheries**

In addition to the reaches listed above, licensees must determine how the Project affects water temperatures. The PAD provides water temperature data, but fails to adequately characterize the basic magnitudes of change caused by the Project and the impacts of these altered temperatures. For example, unnaturally low flows in the Middle Yuba River and Oregon Creek below project dams can increase water temperatures above critical thresholds for cold-water fishes. The instream flow requirement in the North Yuba River below New Bullards Bar is extremely low compared to historic low flows for that river channel.

### **Salmon and Steelhead in the Project Area**

Contrary to what YCWA states in the PAD on page 7.3-6, Central Valley steelhead and Central Valley spring-run Chinook salmon are special-status (Federally Threatened) fishes which do occur presently in the Project Area. Even when limited to a 0.25-mile zone around the Narrows II facility, the Project Area includes the section of the lower Yuba River from a ¼ mile below the Narrows II outlet up to the face of Englebright Dam. Observations of salmon and steelhead in this area are common, and as even stated in the YCWA PAD (p. 8-13) “fish can and do pass upstream of the [Narrows II] powerhouse tailrace to the face of the dam.”

### **Historical Extent of Salmon and Steelhead**

The PAD incorrectly interprets information on historical distribution of salmon and steelhead in the Yuba River watershed. The PAD fails to reference the Upper Yuba River Studies Program (UYRSP) Report’s (2006) Appendix C: Assessment of Adult Anadromous Salmonid Migration Barriers and Holding Habitats in the Upper Yuba River. Without any use of field data contained in the UYRSP Report’s Appendix C, the PAD incorrectly concludes that salmon and steelhead did not historically ascend more than 1.5 miles upstream in the Middle Yuba, citing Yoshiyama et al. (2001) which included a second-hand reference to a 10’ waterfall at this location. The UYRSP found no such potential barrier. A falls located 0.4 miles upstream of the North Fork confluence was assessed to be passable by salmon and steelhead at flows exceeding 200 cfs. Other than Our House Dam, the first low- and high-flow barrier to upstream migration of salmon and steelhead in the Middle Yuba River is located at River Mile 34.4.

## **4.2 Tributaries**

The PAD fails to address information and issues associated with three tributaries affected by the project, Oregon Creek, Dry Creek and Deer Creek. YCWA diverts water from Oregon Creek at the Log Cabin Dam site. It is also important to note that for a short distance, YCWA’s project augments Oregon Creek’s natural flow with water diverted from the Middle Yuba before diverting it to New Bullards Bar Reservoir. Tributaries are hotspots for fish and aquatic biota. YCWA’s diversion affects the health of the aquatic biota in the tributary itself, and at the tributary junction with the mainstem.

The lower Yuba River has only two tributaries that offer meaningful value to fish, Dry Creek and Deer Creek. The PAD does not acknowledge that both Dry Creek and Deer Creek are designated by NMFS as critical habitat for steelhead and spring-run Chinook salmon. Hydrologic alteration of the lower Yuba River by the project may affect the resources in these tributaries, including use by anadromous fish. Both tributaries could be investigated for potential enhancements of wild fish population through spawning, rearing of fry, or partial rearing.

Dry Creek may provide substantial habitat for salmon, steelhead and other fish, but the capacity and limitations of this habitat have not been assessed. Barriers to migration of salmon into Dry Creek have been installed by the California Department of Fish and Game during some periods to prevent possible mortalities when habitat conditions change. Flows in the lower Yuba River may affect the quality and utilization of habitat in Dry Creek. This issue also pertains to the lowest reach of Deer Creek.

### **Direct Effects on Lower Yuba River**

The PAD presents an inadequate rationale for classifying the reach of the lower Yuba River below Daguerre Point Dam as subject to only cumulative effects. Project facilities and operations directly affect flows, water quality and habitat conditions in the entire lower Yuba River, including the reaches below Daguerre. There are no significant tributary influences or other hydrologic influences in comparison to the overwhelming effects of Project operations. Figures 6.3.2-1 and 6.3.2-2 illustrate that flows in the lower reaches of the Yuba River are primarily determined by project operations during most of the year.

## **5 Additional Studies or Information Needs**

### **5.1 Anadromous Fish Passage**

The Licensee should conduct a study to identify the most effective strategies to provide fish passage over Project facilities, including Englebright, Our House, Log Cabin and New Bullards Bar dams to provide anadromous fish access to historic habitat, significant portions of which remain capable of supporting spring run Chinook and steelhead trout. As described in Section 2, Englebright Dam is rightly considered part of the Project for the purpose of determining Project effects and developing protection, mitigation and enhancement measures. In addition, even if this proceeding does not yield passage over Englebright Dam, it is reasonably foreseeable that a fishway will be constructed to provide fish passage around Englebright Dam as a result of the ongoing consultation between the National Marine Fisheries Service and the Corps of Engineers pursuant to Section 7 of the Endangered Species Act or other efforts consistent with the Recovery Plan for ESA protected Central Valley salmonids. Therefore, study of project effects on anadromous fish habitat above between and above Project dams should also be performed. The Fish Passage Study should address at least the following issues:

- Fish Passage Options over Englebright Dam, Our House Dam, New Bullards Bar, and Log Cabin dams.
- Attraction flows necessary for effective operation of any fishways to be constructed on the North, Middle, and South Yuba Rivers.
- Natural barriers and passage options, including the reach below the North-Middle Yuba confluence.
- Effects of flows and flow fluctuations on each life history stage.
- Current spatial and temporal patterns of salmonid rearing habitat utilization and how capacity for different rearing strategies change with flow?
- Effects of flow patterns on attraction of hatchery fish and strays into the Yuba system.
- Flows necessary to support holding, spawning and rearing in reaches to be accessible to anadromous fish.
- Draft Implementation Plan for lower Yuba River Anadromous Fish Restoration concludes with a list of necessary studies that should be considered in coordination with the studies needed for relicensing.

The Commission should require study of instream flow requirements for anadromous fish upstream of Englebright Dam, as far as complete natural barriers on the Middle Yuba at RM 34.4 and on the South Yuba at RM 35.4, and on the North Yuba (assuming, to start, a trap and haul program past the reservoir), as may be determined.

It is “reasonably foreseeable” that salmon will be reintroduced to the upper Yuba River watershed during the term of the future Project’s license, if not within the next ten years. Currently, only four of 19 historic populations of Central Valley Spring-run Chinook remain and the Technical Recovery Team has concluded that reintroductions to historic habitats upstream of dams is a necessary action to reduce the risk of extinction. NMFS has identified the Yuba River watershed as a primary recovery opportunity. Many studies and efforts point to some reintroduction into Project areas upstream of Englebright Dam as a reasonable, feasible, and foreseeable action. Listed chronologically, these are as follows.

- 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 results of 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.”
- 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.” 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.”

- The foremost scientific evaluation of the viability of Central Valley Spring-run Chinook Salmon and Steelhead (Lindley, et. al. 2007) concluded that the risk of extinction for these threatened evolutionary significant units (ESU’s) 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.
- 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 the upper Yuba River watershed as a “Priority Area for Reintroduction” of spring-run Chinook salmon. 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.”
- The National Marine Fisheries Service 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.
- Ongoing, 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.
- The North Yuba Reintroduction: Still in the exploratory phase, the NYRI was initiated by YCWA to explore the feasibility of reintroducing salmon into the North Yuba River. Participants include NMFS, Trout Unlimited, American Rivers, YCWA, DFG, and Corps of Engineers.
- 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. NMFS is working on Biological Opinions for Daguerre and Englebright. NMFS cannot say when the Biological Opinions will be completed as it could be pre-decisional to the ESA lawsuit. On March 7th, 2011, a federal district court will hear arguments addressing the deadline for the Biological Opinion.

- The Obama Administration Budget includes a line item for Army Corps of Engineers to conduct a feasibility study of anadromous fish passage options at Englebright Dam.

## **5.2 Water Distribution Use and Efficiency Study**

YCWA must conduct a comprehensive “Water Use and Efficiency Study” that describes magnitudes, timing and ultimate destination of water that is diverted by Our House Dam, Log Cabin Dam, and stored in New Bullards Bar. The study must break out water usage for raw water and treated water customers, and water that eventually flows to the Delta. FERC should require the licensee to establish a comprehensive basin-wide view of water and power because the water supply is affected by the Project and the Project affects water supply. A comprehensive basin-wide view would include the upper Yuba affected by the YBDS projects down to the Yuba River’s confluence with the Feather River.

The study objectives should include:

- Describe the water rights, water sales, purchases, seasonality of deliveries as well as a description of the distribution and ownership of water.
- Study the demands on system including export water to agriculture, human consumption, and environmental water account.

Project operations are primarily driven by water demand from downstream irrigators, water purchasers, contracts, and agreements. Therefore, the sale and conveyance of water downstream of the YCWA project drives the operations of the YCWA hydropower project, impacting the river reaches below the FERC-regulated facilities. The PAD and subsequent studies should also describe the effects of operating the Project to comply with downstream regulatory requirements, including any Delta flow or water quality criteria.

Additional rationale for this study is provided in Section 2.2 above.

The study should provide an overview and details of consumptive water deliveries and sales of YCWA via both constructed and natural waterways. The study should provide the needed information on how YCWA’s hydropower system provides water for delivery to water purchasers. The report should include canals and ditches within FERC jurisdiction as well as water conveyance dependent on the Project and those that affect the operations of the Project,

particularly the irrigation districts with contracts to purchase YCWA water depend on the project operations. These include:

- Browns Valley Irrigation District
- Cordura
- Dry Creek MWG
- Hallwood
- Brophy
- South Yuba
- Ramirez
- Naumes
- Gifford-Hall
- Wilbur

In addition, the ditches called Big Ravine, China Canal, Smartsville Canal, and Unity Ditch could serve as an alternative for fish passage from the lower Yuba to reaches upstream of Englebright Dam. This study or the Fish Passage study should provide a map and schematic of these conveyance systems as well as a description of their current use.

YCWA should analyze the differences between the water that is diverted for water supply and water that is diverted exclusively for hydropower. These operations for water supply incur their own impacts on the environment and deserve their own analysis in YCWA's relicensing. Some diversions and hydropower generation would take place regardless of the water 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.

Lastly, YCWA should submit supplemental information how downstream water demands might affect the choice of hydrologic modeling for YCWA's relicensing.

To date, FERC has maintained a "hands off" approach to water supply issues in hydropower relicensings in California. FERC has considered water supply to be a fixed, independent constraint, dictated by water purveyors. However, the Yuba River Development Project is operated for dual-purposes - power generation and water supply – just like its neighboring hydropower projects, the Yuba-Bear/Drum-Spaulding projects (YBDS).

FERC and YCWA should consider the outcome of a similar discussion in the neighboring YBDS projects. During relicensing, the Foothills Water Network and National Marine Fisheries Service proposed a study of water supply and its relation to hydropower operations. The licensee and FERC argued that the information was already available and therefore the study was not

necessary. 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...”[1]

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.”[2] 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.

Water supply is a central priority in YCWA’s management of its Project. YCWA should collect relevant information and analyze it in order to inform license conditions.

### ***5.3 Hydropower Operations Impacts on Flood Control***

Englebright Afterbay does not provide much, if any, capacity for limiting flooding. The Afterbay’s primary function (though not its original purpose) is to serve as a re-regulating Afterbay for New Colgate Powerhouse’s peaking flows. But, in terms of flood control, once New Bullards Bar is spilling, Englebright does not have the capacity to further attenuate flood magnitudes in a significant manner. YCWA makes this case themselves in its Report on Phase II Formulation and Analyses of Alternatives for Supplemental Flood Control Program on the Yuba River<sup>3</sup>.

In light of New Bullard’s Bar’s flood control function, we recommend conducting the following studies:

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<sup>3</sup> Appendices Report on Phase II Formulation and Analyses of Alternatives for Supplemental Flood Control Program on the Yuba River. Prepared for Yuba County Water Agency by Bookman-Edmonston Engineering, Inc. June 1999

- Study of flood control requirements, efforts, and plans in YCWA's Hydropower Project including Englebright Dam and Reservoir. Study should also include relation between existing lake elevations and drawdown required to meet flood control needs.
- Study of various elevation scenarios for Englebright's dam face and lake surface elevation and effects on Englebright's function as a Forebay for Narrows 2 and Afterbay for Colgate peaking power operations. This study should include effects on power generation and revenues.

Additional rationale for these studies can be found at section 2.3 above.

#### **5.4 Exports from the Upper Yuba River Watershed Study**

YCWA should conduct a study of how the Project must react to significant water exports by the Nevada Irrigation District's Yuba-Bear Project and PG&E's Drum-Spaulding Project upstream on the Middle Yuba and South Yuba.

YCWA commented on the PG&E and NID's Draft License Applications:

The amounts of water that are available to the YRDP, which also is undergoing relicensing by the Commission, are affected by Y-B/D-S Projects' diversions and exports. As explained in detail in this letter, the DLA's ignore the significant adverse impacts of the Y-B/D-S Projects on Lower Yuba River flows and temperatures while expressly relying on the YRDP to mitigate these impacts. The Y-B/D-S Projects Applicants (Applicants) should correct these deficiencies before they file their final license applications for these projects with the Commission<sup>4</sup>.

Each of these three licensees - PG&E, NID, and YCWA - have effects that cumulatively, negatively impact the Lower Yuba river flows and anadromous fish. The fact that multiple parties impact the resources should not absolve any one of them of their responsibility under FERC.

Together, the YBDS projects export a combined 400,000 af/yr. from the Middle and South Yuba watersheds. NID's Yuba-Bear Project alone diverts an average of 60,000 af/yr. from Middle Yuba into the Milton Bowman Tunnel, which conveys the water to Spaulding from where much of it is then exported to the projects' hydropower facilities on the Bear River.

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

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<sup>4</sup>YCWA Comment January 31, 2011 on Draft License Applications for Nevada Irrigation District's Yuba-Bear Projects and Pacific Gas & Electric's Drum-Spaulding

average of over 60,000 af/yr., the NID Yuba-Bear Project, directly affects the amount of water that is available to YCWA to meet its instream flow releases below Englebright Afterbay.

Releases into the lower Yuba are governed by releases at New Bullard's Bar Dam, which is, in turn, affected in part by the operations at YCWA's Our House diversion, which is affected in part by how much water is diverted by NID's Milton-Bowman Tunnel. More specifically, the Lower Yuba River Accord has a provision that flows in the lower Yuba will be based on actual inflow to Yuba County Water Agency's New Bullards Bar Project. In order to feed water into New Bullard's Bar, YCWA depends, in part, on the instream flow in the Middle Yuba, which is significantly decreased by the NID Milton-Bowman diversion upstream. In other words, the PG&E and NID Projects export water from the Middle Yuba, resulting in less water available for YCWA to divert into New Bullards Bar or flowing directly through Englebright Afterbay. NID and PG&E diversion, therefore, reduce the amount of flow released into the lower Yuba for anadromous fisheries and ecosystem health.

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.

## **5.5 Aquatic Invasive Species**

YCWA must include in their studies a thorough inventory of aquatic invasive species (AIS) and the EIR must address project effects on AIS or the conditions effecting their introduction and spread. Some AIS are associated with developments, including dams and hydroprojects, and various preventative or control actions may be warranted as protection or mitigation depending on the actual distribution of invasive species. For example, *Didymosphenia geminata* is a diatom which produces nuisance blooms within the region and has been associated with dams (Kirkwood et al. 2009)<sup>5</sup>.

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<sup>5</sup> Kirkwood, A. E., Jackson L. J. and McCauley, E. (2009), Are dams hotspots for *Didymosphenia geminata* blooms? *Freshwater Biology*, 54: 1856–1863. doi: 10.1111/j.1365-2427.2009.02231.

The study proposals submitted with the PAD do not sufficiently address AIS. An adequate survey of AIS could be accomplished by utilizing sample sites for other aquatic resource studies. However, a complete list of potential AIS for the watershed must be acquired, and all crews adequately trained for their detection. Whether a new comprehensive study, or as components of other aquatic resource studies (e.g. fish, benthic macroinvertebrates and mollusks), implementation must involve quality control for making sure adequate effort was expended to survey for AIS.

## **5.6 Mercury Methylation and Transport**

The impacts of the project on mercury methylation and transport must be studied by YCWA and the EIR must address this critical issue. Mercury is a water quality constituent of national concern. Consumption of mercury-laden fish leads to developmental delays in fetuses, infants, and children, and can lead to neurological symptoms and other health problems in adult humans as well as ecological problems in wildlife (Weiner et al. 2003)<sup>6</sup>. The transport of mercury and methylmercury through Sierra Nevada reservoirs (via spillways and controlled releases) is a significant contributor to Bay-Delta methylmercury levels. Over a 20-year period (1984-2003) it is estimated that 98% of total mercury loads to the Delta came from upstream tributaries (Wood et al. 2010)<sup>7</sup>.

YCWA's proposed bioaccumulation study plan, while contributing some valuable data on mercury toxicity in fish tissues, does not evaluate the effects of the project for potentially increasing the transport and biological uptake of mercury. YCWA's proposed Water Quality study includes the most minimal sampling of methylmercury and no framework, or statistical power, for evaluating project effects on the availability of this toxin. An additional and integrated study must be conducted to assess the project effects on mercury methylation and transport.

The North Yuba, Middle Yuba, South Yuba, Englebright Reservoir, and the lower Yuba River are all listed as an impaired water bodies under the Clean Water Act 303(d) because of mercury

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<sup>6</sup>Wiener, J.G., Gilmour, C.C., and Krabbenhoft, D.P., 2003a, Mercury Strategy for the Bay-Delta Ecosystem: A Unifying Framework for Science, Adaptive Management, and Ecological Restoration: Final Report to the California Bay-Delta Authority, 67 p.  
(<http://science.calwater.ca.gov/pdf/MercuryStrategyFinalReport.pdf>)

<sup>7</sup>Wood, M.L., Morris, P.W., Cooke, J., and Louie, S.J., 2010a, Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin Delta Estuary Staff Report, April 2010, 331 p. plus appendices.

contamination (CVRWQCB 2007)<sup>8</sup>, or approved for listing by both the State Water Board and EPA (SWRCB 2010)<sup>9</sup>. Englebright Reservoir has been severely compromised by mercury residing in sediments that have been deposited in the upper reaches of the reservoir, and the State Water Board has issued a date for setting a Total Maximum Daily Load (TMDL) of mercury for 2016. The mercury contamination is manifested in elevated fish tissue concentrations documented by the USGS (May et al. 2000)<sup>10</sup>, which are the basis of a fish consumption advisory issued by the California Office of Environmental Health Hazard Assessment. Project reaches upstream of Englebright deliver mercury to the reservoir where the principal outlet, YCWA's Narrows II facility, conveys mercury downstream.

### **Impacts of Project Powerhouses on Mercury Methylation and Transport**

This relicensing must study the potential for turbines at the New Bullards Bar Minimum Flow, New Colgate, and Narrows II powerhouses to increase the downstream yield of biologically active mercury. Elemental mercury adhere to fine sediment which, when broken down to finer particles, increases the exposure of mercury to oxygenation, thus becoming more susceptible to methylation. Recent studies have shown that the mechanics of dredging sediments in the South Yuba River increase the methylation and transport of mercury downstream, increasing entrance into the biotic environment. Mercury gets flowered as it goes through a dredge (Fleck et al 2011<sup>11</sup>), and its subsequent oxygenation makes it more reactive and more likely to methylate (Marvin-DiPasquale et al. 2011<sup>12</sup>). The mechanism of dredges increasing fine particles is similar

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<sup>8</sup>CVRWQCB (Regional Water Quality Control Board - Central Valley Region), 2007, 2006 CWA Section 303(d) List of water quality limited segments requiring TMDL's, USEPA approval date, June 28, 2007, accessed Feb. 27, 2011 at:

[http://www.swrcb.ca.gov/water\\_issues/programs/tmdl/docs/303dlists2006/epa/r5\\_06\\_303d\\_reqtmlds.pdf](http://www.swrcb.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r5_06_303d_reqtmlds.pdf)

<sup>9</sup>SWRCB 2010. Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report

[http://www.waterboards.ca.gov/water\\_issues/programs/tmdl/integrated2010.shtml](http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml)

<sup>10</sup>May, J.T., Hothem, R.L., Alpers, C.N., and Law, M.A., 2000, Mercury bioaccumulation in fish in a region affected by historic gold mining: The South Yuba River, Deer Creek, and Bear River watersheds, California, 1999: U.S. Geological Survey Open-File Report 00-367, 30 p.

(<http://pubs.water.usgs.gov/ofr00-367/>)

<sup>11</sup>Fleck, J.A., Alpers, C.N., Marvin-DiPasquale, M., Hothem, R.L., Wright, S.A., Ellett, K., Beaulieu, E., Agee, J.L., Kakouros, E., Kieu, L.H., Eberl, D.D., Blum, A.E., and May, J.T., 2011, The effects of sediment and mercury mobilization in the South Yuba River and Humbug Creek Confluence Area, Nevada County, California: Concentrations, speciation, and environmental fate—Part 1: Field characterization: U.S. Geological Survey Open-File Report 2010-1325A, 104 p.

<sup>12</sup>Marvin-DiPasquale, M., Agee, J.L., Kakouros, E., Kieu, L.H., Fleck, J.A., and Alpers, C.N.,

to the potential mechanism of turbines breaking down sediment particles. This mechanism may be responsible for why greater concentrations of methyl mercury are found below dams (Alpers et al. 2008)<sup>13</sup>.

When reservoirs are turbid, in particular, hydropower facilities may increase the yield of methylated mercury to downstream reaches by converting elemental or particulated mercury into a form where methylation occurs. This increase in the yield of methylated mercury would be concomitant with an increase in mercury though the trophic levels of organisms in the lower Yuba River, Sacramento River and the Delta. If such an increase in the yield of methylated mercury to the lower Yuba River were occurring, then several potential project modifications or mitigations may be considered. For example, bypasses could be utilized during periods of high turbidity, or the licensee could implement projects to reduce methylated mercury formation in other parts of the watershed, such as the shallow zones of Englebright Reservoir.

### **Impacts of Englebright Afterbay and Englebright Dam on mercury methylation and transport**

The upstream end of Englebright Reservoir features several miles of deep accumulations of sediment known to contain high levels of mercury<sup>14</sup>. High flow events from spill at New Bullards Bar Dam and peak flows at the New Colgate powerhouse likely elevate turbidity from this alluvial fan. Research conducted at the Camp Far West reservoir<sup>15</sup> suggests that warmer waters in these shallower depths, coupled with high flow fluctuations, provide a prime environment for the methylation of mercury. Subsequently, fluctuating flow events create new opportunities for the mercury in the sediment layers to be made accessible to the bacterium and other conditions that induce methylation, while carrying the methylated mercury, and other mercury attached to fine particulates, downstream. Englebright Dam currently cannot regulate spillover events (inflow and outflow is largely controlled by licensees); thus the turbid waters

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2011, The effects of sediment and mercury mobilization in the South Yuba River and Humbug Creek confluence area, Nevada County, California: Concentrations, speciation and environmental fate—Part 2: Laboratory Experiments: U.S. Geological Survey Open-File Report 2010–1325B, 54 p.

<sup>13</sup>Alpers, C.N., Stewart, A.R., Saiki, M.K., Marvin-DiPasquale, M.C. Topping, B.R., Rider, R.O., Gallanthine, S.K., Kester, C.A., Rye, R.O., Antweiler, R.C. and De Wild, J.F., 2008, Environmental factors affecting mercury in Camp Far West Reservoir, 2001-03. U.S. Geological Survey Scientific Investigations Report 2006-5008, 358 p.

<sup>14</sup>Alpers, Charles N., et. al.: Geochemical Data for Mercury, Methylmercury, and Other Constituents in Sediments from Englebright Lake, California, 2002

<sup>15</sup>Kuwabara, James S., et. al.: Sediment-Water Interactions Affecting Dissolved-Mercury Distributions in Camp Far West Reservoir, California, 2002

transport suspended solids that are now known to adhere to fine methylmercury particles through both the Narrows turbines and over the Englebright spillway during high flow events. In light of the OEHHA fish advisories for mercury toxicity at the New Colgate Afterbay and New Bullards Bar reservoir, as well as upcoming promulgation of a mercury TMDL (set for issuance by the SWRCB in 2016) for Englebright Reservoir (i.e. the New Colgate Afterbay) and subsequent regulation of Englebright Dam and the licensee's discharge at Narrows II (which will of course take into account the impacts of mercury on the biotic environment), YCWA should determine the concentrations and forms of mercury in water, sediment and biota through time (include seasonal changes) in the following locations: Above New Bullards Bar, New Bullards Bar Reservoir, Colgate intake water, Colgate tailwater, Middle Yuba, Englebright Reservoir, Narrows Intake, Narrow Effluent, Englebright Dam spillover (as impacted by New Bullards Bar & New Colgate Powerhouse operations), and the Lower Yuba River, in order to determine the projects' impacts to mercury flowering, methylation, and transport.

## **6 Modifications to Proposed Studies**

### **6.3 ESA/CESA-Listed Salmonids Downstream of Englebright Dam**

YCWA must conduct studies that address the role of project-determined temperature regimes in influencing the abundance and diversity of the anadromous form of *Oncorhynchus mykiss* (steelhead/rainbow trout). The EIR for this relicensing must address project effects on the anadromous portion of this species in relation to the resident form. According to NMFS, only anadromous steelhead are listed under the ESA and recovery of the anadromous form of *O. mykiss* is necessary for delisting.

As a result of the Project, the lower Yuba River runs colder than it would naturally. While this cold-water management protects against stressfully warm temperatures for salmon and steelhead, it has been hypothesized that the constant provision of cold water deters rainbow/steelhead (*O. mykiss*) individuals from developing an anadromous life history. The resulting shift in populations from predominately anadromous to resident has been cited as a factor increasing the risk of extinction for steelhead in the Central Valley of California (Lindley et al. 2007). For the lower Yuba River, data exists to support the hypothesis and substantiate the need for formal investigation.

The California Department of Fish & Game (CDFG) (1970) presented size data from *O. mykiss* trapped in 1968-70. Of the 32 captured steelhead, 25 measured 20" or more in length, and five measured 27" or greater in length. During this pre-project period, the average size of fish captured was markedly larger than those seen recently at fish counting facilities at Daguerre Point Dam. Additional evidence of larger *O. mykiss* in the past is available in CDFG Tech

Memos from Steelhead surveys of the lower Yuba River in 1976-1977, and cited in the YCWA PAD. The larger sizes are indicative of anadromy, and these are extremely rare now on the lower Yuba River. Mitchell (2010) used analysis of scales to conclude that only 1% of 467 adult *O. mykiss* captured by anglers on the lower Yuba River (1998-2007) were anadromous.

YCWA should conduct studies and develop an EIR that addresses the role of project-determined flows and temperature in influencing hatchery strays into the Yuba River. Furthermore, the geographic scope of this relicensing must include the confluence with the Feather River. The lower Yuba River is the largest river in the Central Valley without a hatchery and supports important wild-spawning populations of fall-run Chinook, late-fall-run Chinook, spring-run Chinook and steelhead. Elevated flows due to hydropower project operations can increase contribution of hatchery and non-natal salmon and steelhead to in-river spawning populations. For example, an unusually large (>2000) count of salmon at Daguerre Point Dam in June 2010 can be attributed to the fact that during this month the Yuba River was flowing greater than 2000 cfs (an ideal water temperature for salmon) compared to the Feather River which was flowing approximately 700 cfs at 70° Fahrenheit. Over 60% of these were hatchery fish, most likely the Feather River Hatchery. For spring-run and steelhead, high rates of hatchery stock mixing increases the risk of extinction (Lindley et al. 2007).

#### **6.4 Hydrologic Alteration Study**

This study should include an evaluation of the existing outlet works and options for modifications that would enable the project to meet new instream flows or recreate the snowmelt recession to meet habitat needs for target species. The study should evaluate maximum capacity, range of control, and if the particular valve or gate can be controlled remotely. The study should answer questions like:

Why cannot the Lohman tunnel slide gate regulate flow, and what options exist for improving the gate so it can regulate flow? The study should consider options such as bulkhead gates on wheels or on rollers.

The study should also evaluate the following about ramping rates and Project impacts at all Project diversions, including Englebright Dam:

- Determining if the amount of water discharged from Narrows II Powerhouse is ramped at a rate sufficient to allow fish to move to protected areas of deeper pools.
- Determining if coordinated operations of YCWA and PG&E's Narrows powerhouses could reduce stranding of fish in the Yuba River.
- Determining what the Project's ramping rates are under current operations, and evaluating what produces those ramping rates and why. One way of doing this is to maintain and operate stream gages to monitor ramping rates during project operations.

- Determining how and why the Project negatively impacts spring snowmelt flows and therefore habitat for rainbow trout/steelhead, benthic macroinvertebrates, Foothill Yellow-Legged Frogs, Spring-run Chinook and other listed species. The Project creates precipitous declines in flows during the period of spring snowmelt, contrary to a long, gradually descending snowmelt recession experienced under unimpaired conditions. According to Sarah Yarnell’s recent paper, this slowly descending limb of the snowmelt hydrograph is very important for many aquatic biota including trout spawning and Foothill Yellow-Legged Frogs<sup>16</sup>.
- Addressing New Colgate Powerhouse peaking releases into the North Yuba and their negative impacts on fish and other aquatic resources.

The Hydrologic Alteration Study should contain the most recent PMF calculations for all structures.

### ***Snowmelt Recession***

A growing body of research has established that the unimpaired snowmelt recession limb has broad and deep ecological importance<sup>17</sup>. The unimpaired snowmelt recession is integral to properly functioning springtime aquatic and riparian habitats. For example, 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 and 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 it can desiccate the eggs.

The US Forest Service regards FLYF as a “Species of Concern”, due to FLYF’s apparent widespread 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<sup>18</sup>. In parallel, extensive work has been done to describe the snowmelt recession limb in unimpaired systems<sup>19</sup>.

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<sup>16</sup>Yarnell, Sarah et al. Ecology and Management of the Spring-Snowmelt Recession. Draft April 2008.

<sup>17</sup>See Appendix A: Ecology and Management of the Spring Snowmelt Recession by Yarnell et al

<sup>18</sup>See Appendix B: 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

<sup>19</sup>Appendix C: 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 FYLF and improve aquatic and riparian habitat downstream of major project reservoirs.

Amy Lind’s *Assessment of Risks to Sierra Nevada Populations of Foothill Yellow-Legged Frogs (Rana boylei) Under Varying Snow-Melt Hydrograph Recession Rates in Rivers* shows that the recession rate during frog breeding should not be greater than -1’ in 3 weeks in order to protect FLYF<sup>20</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>21</sup>

The Hydrologic Alteration Study should specifically address existing information, public notice, public safety, historical operations, and effects of ramping rates below New Colgate Powerhouse, Our House Dam, and Narrows II Powerhouse and Englebright Dam, which affect the North, Middle, and mainstem Yubas above and below Englebright Dam. For example, the Licensees’ operations between New Colgate Powerhouse and its afterbay have transformed what would otherwise be a gradually descending limb on North Yuba’s hydrograph to a precipitous decline in flows. The resulting steep descending limb of the hydrograph diminishes ecosystem health

### **6.5 Instream Flow Study Above Englebright**

This study should include Chinook salmon and steelhead as target species due to the reasonable and feasible reintroduction of Chinook salmon and steelhead. Without inclusion of these target species, application of fieldwork and analysis may fail to adequately represent habitat, and analytic results will fail to characterize habitat-flow relationships to inform license conditions.

### **6.6 Geomorphology Study Above Englebright**

This study should include Chinook salmon and steelhead as target species due to the reasonable and feasible reintroduction of Chinook salmon and steelhead. Without inclusion of these target

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<sup>20</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>21</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.

species, application of fieldwork and analysis may fail to adequately represent habitat, and analytic results will fail to characterize habitat to inform license conditions.

The PAD does not provide a snapshot of the current status of cobble and sediment deposits behind New Bullards Bar Dam, Our House Dam and Englebright Dam. In its Geomorphology Study or supplemental information submission, YCWA should provide information on past measures for managing these deposits, and any future plans for managing the deposits should be described. Also, river reaches below New Bullards Bar, Our House, Log Cabin and Englebright dams do not receive natural supplies of sediment and thus have undergone geomorphic change.

### **6.7 Riparian Study Above Englebright**

This study should include Chinook salmon and steelhead as target species due to the reasonable and feasible reintroduction of Chinook salmon and steelhead. Without inclusion of these target species, application of fieldwork may fail to adequately represent habitat, and analytic results will fail to characterize habitat to inform license conditions.

The PAD claims that, “Since the completion of New Bullards Bar Reservoir, the riparian community [of the lower Yuba River] has expanded under stream flow conditions that have generally been higher than those initially required” (p. 7.6-6). This view is not supported by available data but can be tested through a relicensing study involving riparian mapping and historical analysis. The PAD provides a description of historic mining, dredger activities and construction of Englebright Dam as factors eliminating or keeping in poor condition riparian vegetation. A more complete characterization of the processes effecting riparian communities on the Yuba River would, however, include a description of how hydrologic alteration may be limiting the ability of certain woody species to successfully recruit. Such a description, along with a conceptual model, is presented in a recent report providing a basis for rehabilitation planning (cbec 2010). A more complete understanding or accounting of processes leads to a hypothesis that the natural recovery of riparian communities following massive mining impacts is being limited by both the sediment retention of upstream dams and hydrologic alteration.

### **Impacts of New Bullards Bar Dam, Our House Dam, Log Cabin Dam, and Englebright Dam on woody debris**

New Bullards Bar Dam, Our House Dam, Log Cabin Dam, and Englebright Dam block passage of woody debris and spawning material through the Yuba River. This depletion of woody debris diminishes spawning habitat availability in the reaches below each of these structures, reducing the complexity of habitat throughout the Yuba River. Low levels of fisheries habitat complexity reduce life history, diversity, production, and resiliency to environmental change.

## **6.8 Water Temperature Monitoring and Modeling Studies**

The reservoir water temperature monitoring study as planned is not adequate to accurately characterize the cold-water pool and inform the review or development of strategies to manage the cold water pool. The study proposes only two sampling locations each in Englebright Afterbay and New Bullards Bar, one near each dam and one 3.3 miles away. Enough additional locations should be added to thoroughly characterize cold-water pool dynamics.

## **6.9 Spill Flow Ramping**

YCWA should study the feasibility of instituting ramping rates before and after spill events to avoid downstream effects on the ability of river organisms to find velocity refuges and on stranding.

## **6.10 Whitewater Boating Study**

The whitewater boating study should include the reach from Hwy 49 downstream to the confluence with the North Yuba River; the takeout will be at Rice's Crossing, the same as was used for the previous study. This study should be separate from the study from Our House Dam to Hwy 49. Both studies could be run concurrently to save on water. We do not agree with the statement in Study 8.2, Whitewater Boating Study November 2010, where YCWA states:

Thus, Licensee believes the information from the 2008 New Bullards Bar Dam Whitewater Boating Study is adequate to characterize the acceptable flow ranges for whitewater boating on the entire 12-mile portion of the MYR from Highway 49 downstream to USACE's Englebright 'Reservoir (non-project).

The licensee provides no information to describe the 4.5 miles of the Middle Yuba from highway 49 to the confluence of the North Fork Yuba River. Information on this run is insufficient to determine the flows necessary to meet the needs of whitewater recreation.

In order to be consistent, the same reaches should be evaluated for whitewater boating and angling. Therefore, in addition to the proposed boating studies, a reconnaissance should be conducted on Oregon Creek below Log Cabin Dam.

## **6.10 Angling Study**

YCWA should conduct an angler survey to determine the value, health and use of the fishery and how the Project affects angling, such as late spring and early summer Project flows that make angling difficult. The study should also address fishing guides on the lower Yuba, the number of angler days associated with fishing guides, and the amount of annual revenue generated by fish guiding.

There are a number of fly fishing clubs who fish the following river reaches:

- Above New Bullards Bar – Access point Shanghai Flat
- Oregon Creek
- Middle Yuba below Our House Diversion
- Confluence of Oregon Creek and Middle Yuba
- Above Hwy 20 on the lower Yuba
- Highway 20 to Daguerre on lower Yuba

The Oregon Creek section below the Log Cabin Diversion that is regularly fished is brushy with lots of canopy and good temperatures for fish.

Local Fishing Clubs include: Granite Bay Flycasters, Gold Country Flyfishers, and Auburn Flycasters.

## **6.11 Water Play**

Inner-tubers and swimmers recreate in river reaches impacted by the YCWA Hydropower Project. A partial list includes:

- Lower Yuba – Englebright to Daguerre – inner tubing, swimming; especially the Parks Bar to Hammon Grove reach
- Confluence of Oregon Creek and Middle Yuba – swimming hole

### **Public Safety and Information**

The lack of adequate, publicly available and consistent flow information is an issue for public recreation on the Yuba River below Englebright Dam. Primarily, walk and wade anglers and inner tubers need to be able to check current flows and schedules online and at put-in in order to avoid stranding. Under current operations, 1 or 2 anglers drown each year with possible links to lack of information about flows.

Current coordination between PG&E and CDEC to manage existing gauges on the Yuba often produces data gaps due to long and frequent periods of gauge malfunction and lacks clear guidelines for responsibility. The number of publicly available gauge sites is also inadequate to provide information for enhancing recreation opportunities in a safe manner.

Additional, publicly available flow information is needed on the Yuba River below the confluence with Deer Creek and Narrows Rapids. This flow information is needed because Deer Creek contributes significant input of flows to the lower Yuba, which are not captured by the current gauge upstream of Deer Creek at the bottom of Englebright Reservoir.

## **6.12 Studies Below Englebright**

Most of the proposed studies for resource conditions below Englebright Dam (e.g. Instream Flow, Fisheries and Geomorphology) rely on existing information and information being collected by the Yuba Accord River Management Team (RMT). Although the amount of information available is often large, this approach may not provide adequate results for the objective of evaluating effects of the Yuba River Development Project. All studies should be guided by explicit objectives of evaluating project effects, not simply characterizing conditions or summarizing available information. The Yuba Accord RMT has developed a monitoring and evaluation plan (M&E Plan) to evaluate the Yuba Accord, not necessarily the entire effects of the project. Furthermore, the M&E Plan has a schedule of studies that extends through 2015 and may not produce flow and habitat information needs in a timely manner for the relicensing process. We encourage FERC to require rigorous and timely studies for the lower Yuba River.

### **Riparian Study Below Englebright**

On the lower Yuba River, effects of the project on riparian vegetation are difficult to assess due to the pre-existing effects of legacy mining and the construction of Englebright Dam. Dredging activities and the construction of “training walls” (c. 1906-1939) have artificially constrained the river, isolated the majority historic floodplain area, and reduced habitat complexity. Englebright Dam prevents or inhibits the natural supply of fine sediment, impeding germination and recruitment success. These non-project impacts do not negate effects of hydrologic alteration on limiting the recruitment and survival of certain woody riparian species. The combination of factors compels a study, which collects or compiles all the information necessary to evaluate the geomorphic and hydrologic processes affecting riparian conditions. By taking a framework approach to the study, similar to Burke et al (2009), the underlying physical processes can indicate how hydropower effects are contributing uniquely or synergistically with these other factors.

The objectives of the study should be to:

1. Document changes to woody riparian vegetation (including age and vertical structure, species composition, and relative abundance) within the lower Yuba River corridor before and after completion of the project and before and after Englebright Dam;
2. Investigate causal mechanisms responsible for these changes; and
3. Develop future desired ecological conditions for woody riparian vegetation (i.e., age and vertical structure, cover, species composition targets).

Thank you for considering these comments. If you have comments or questions, please contact Julie Leimbach, Coordinator of the Foothills Water Network [julie@foothillswaternetwork.org](mailto:julie@foothillswaternetwork.org) 530-622-8497.

Respectfully,

Foothills Water Network Yuba-Bear Working Group



Handwritten signature of Julie Leimbach.

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