BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

UNITED STATES OF AMERICA

In re. Notice of Intent to File License Application for a New License and Commencing Pre-filing Process; Request for Comments and Study Requests	Project No. 77-285 – California Potter Valley Project, Pacific Gas & Electric Company, Applicant

CONSERVATION GROUP'S COMMENTS ON SCOPING DOCUMENT 1 (SD1) AND PRE-APPLICATION DOCUMENT (PAD); STUDY REQUESTS

BACKGROUND

On April 6, 2017, Applicant Pacific Gas & Electric Co. ("PG&E") filed with the Federal Energy Regulatory Commission ("FERC" or "Commission") a Pre-Application Document (PAD) pursuant to 18 CFR 5.6 of the Commission's regulations for the re-licensing of the Potter Valley Project (P-77, the "PVP" or "Project"). On June 1, 2017, FERC issued Scoping Document 1 ("SD1") regarding the license application. The same day, FERC issued a Notice of Intent to File License Application, Filing of Pre-application Document (PAD), Commencement of Pre-Filing Process, Prepare an Environmental Impact Statement, and Scoping; Request for Comments on the PAD and Scoping Document, and Identification of Issues and Associated Study Requests ("Notice"). The Notice announced Scoping Meetings and called for comments on the PAD and SD1, as well as any relevant information or study requests. The Notice and SD1 set a comment deadline of August 4, 2017.

Pursuant to the Commission's Notice and 18 C.F.R. § 5.9, American Whitewater, California Sportfishing Protection Alliance, California Trout, Friends of the Eel River, Friends of the River, Native Fish Society, and Trout Unlimited and the Redwood Empire Chapter of Trout Unlimited (collectively, "Conservation Groups") provide these comments and study requests. The Conservation Groups seek to restore and conserve the Wild and Scenic Eel River's outstanding resource values, particularly the three salmonid species protected under the federal Endangered Species Act as "threatened." Eel River summer and winter steelhead and chinook salmon are especially affected by the operation of the Project's dams, diversion tunnel, and operations in a variety of ways. We believe the existing license has not achieved a proper balance between power and non-power uses, so we intend to actively participate in the relicensing to assure that the new license better protects the beneficial uses of the Eel River and is in the public interest. These Comments and Study Requests are submitted to advance these interests.

American Whitewater ("AW") is a 501(c)(3) non-profit organization with a mission to conserve and protect America's whitewater resources and enhance opportunities to enjoy them safely. Founded in 1954, AW has over 6,000 members and 100 locally based affiliate clubs,

representing the conservation interests of whitewater enthusiasts across the nation. A significant percentage of its members reside in California and throughout the western U.S. and recreate on the Eel River above Pillsbury Reservoir down to the Confluence of the Middle Fork Eel. AW therefore has an interest in the relicensing process, which will have a direct effect on recreational flows for this reach.

California Sportfishing Protection Alliance ("CSPA") is a 501(c)(3) nonprofit, public benefit fishery conservation organization incorporated under the laws of the State of California in 1983 to protect, restore, and enhance fishery resources and their aquatic ecosystems. CSPA works to ensure that public fishery resources are conserved to enable public sport fishing activity. As an alliance, CSPA represents more than five hundred members. CSPA is a member of the steering committee of the California Hydropower Reform Coalition and the national Hydropower Reform Coalition. Over the past decade, CSPA has actively participated in over a dozen licensing processes, seeking to clarify jurisdictional and procedural issues as well as to achieve substantive improvements for aquatic resources. CSPA has a longstanding interest in the Eel River and the Potter Valley Project.

California Trout ("CalTrout") was the nation's first statewide conservation group supported by trout and steelhead fishermen. Since 1971 CalTrout has worked to ensure there will be resilient populations of wild fish thriving in healthy waters for the future well-being of all Californians. CalTrout is a 501(c)3 non-profit organization headquartered in San Francisco with 5 regional offices located throughout California. CalTrout has a significant interest in the Potter Valley Project's FERC relicensing proceedings due to their restoration and flow policy work on the Eel River and our commitment to protecting California's freshwater systems.

Friends of the Eel River ("FOER") is a nonprofit citizens' group that advocates for policies and practices consistent with the protection and recovery of the Wild and Scenic Eel River's outstanding resource values, particularly the three salmonid species protected under the federal Endangered Species Act. FOER and its supporters use and enjoy the Eel River in the areas surrounding the Project and in Project-affected areas for recreational, aesthetic, and educational purposes, including but not limited to fishing, viewing, and enjoyment of the

outdoors. As detailed in the comments below, if PG&E receives a new license, it could adversely affect those interests. FOER has actively participated in the existing license proceedings, and also attended the Scoping Meetings for this matter.

Friends of the River ("FOR") is a nonprofit 501(c)(3) organization headquartered in Sacramento, California, working to protect, preserve, and restore California rivers and streams for both environmental and recreational purposes. FOR has approximately 3,000 members in the state of California, some of whom live and use the Eel River. FOR has extensive experience with state and federal Wild & Scenic Rivers Acts and systems, having been involved in the designations, management plans, and legal proceedings for California rivers in the systems throughout our history, a history that began in 1973. FOR has also been a party in the Commission's Oroville Dam (Project #2100) proceedings, where FOR raised the issue of the safety and adequacy of the physical works there.

Native Fish Society ("NFS") is a 501(c)(3) nonprofit with the mission to utilize the best available science to advocate for the protection and recovery of wild, native fish and stewardship of the habitats that sustain them. Established in 1995, NFS is a regional grassroots organization with 3,500 members and supporters, and 86 place-based, volunteer River Stewards in California, Oregon, Washington, and Idaho who safeguard their homewaters and advocate for abundant wild, native fish. NFS has a keen interest in the relicensing of the Project. NFS has four River Stewards that live, work and recreate in the Eel River watershed, and NFS River Stewards, staff, and volunteers have conducted multiple years of water temperature monitoring in the headwaters of the Eel River above the Project, which has identified cold-water habitats important for the threatened and sensitive native fish present in the watershed.

Trout Unlimited ("TU") was founded in 1959, and is the nation's oldest and largest coldwater fisheries conservation organization. The group is dedicated to protecting, reconnecting, restoring, and sustaining North America's trout and salmon resources. TU has 160,000 members, including 11,500 in California. Headquartered outside of Washington, D.C., TU has approximately 220 staff working in 36 offices from Alaska to North Carolina. TU maintains California offices in Emeryville, Fort Bragg, Truckee, Carmel Valley, and Mt. Shasta.

In 2016, TU members volunteered more than 725,000 hours, organizing restoration projects on their local rivers and streams, educating youth in environmental stewardship and engaging local decision makers in conservation planning and protection. Trout Unlimited's Redwood Empire Chapter works in both basins. The Eel River is one of TU's highest priorities in California. TU's members fish the Eel River for salmon and trout. It is one of the most highly valued steelhead fishing destinations in the state. TU's staff and partners have invested more than $7 million dollars in habitat restoration throughout the Eel River basin, completing more than 25 separate fisheries restoration projects. The Russian river is another of TU's highest California priorities. For close to 20 years, the organization has maintained a particular focus on water diversions and streamflow resources in that basin, working to assure that the State manages our resources effectively and working where possible with landowners to improve their irrigation systems and domestic water supplies.

These comments are organized into three sections. The first provides comments on SD1. The second provides comments on the PAD. The third states our study requests and indicates our support for study requests made by the resource agencies. The comments also include a bibliography with URL links, where available. We ask that all referenced documents be included within, and considered as part of, the record for this proceeding. The Conservation Groups thank the Commission for the opportunity to participate in this process and to provide the foregoing input.

COMMENTS ON SCOPING DOCUMENT 1

I. Introduction

The purpose of these comments is to assist staff in its environmental review and ensure that all pertinent environmental issues are identified and analyzed. Both Scoping Document 1 and FERC's Notice indicate that the agency plans to prepare an Environmental Impact Statement ("EIS") for the re-licensing of the Project. The Conservation Groups agree that preparation of an EIS for the Project is required under the National Environmental Policy Act (42 U.S.C. §§4321 *et seq*.) ("NEPA"). NEPA requires FERC to prepare an EIS for all "major federal actions significantly affecting the human environment." 42 U.S.C. § 4332(2)(C). Where substantial questions exist as to whether a project will have a significant impact on the environment, NEPA requires the agency prepare an EIS rather than an EA. *See Ocean Advocates v. U.S. Army Corps of Engineers*, 402 F.3d 846, 864-65 (9th Cir. 2004). In particular, FERC's environmental analysis must demonstrate that the agency took a "hard look" at the environmental impacts of the Project. *See The Steamboaters v. FERC*, 759 F.2d 1382, 1393 (9th Cir. 1985).

FERC project licenses dictate the operation of hydroelectric projects for lengthy terms of 30 to 50 years.[1] 16 U.S.C. § 799. Where, as here, such a license involves massive infrastructure and water diversions in a geologically unstable and environmentally sensitive area with numerous listed species, it clear that preparation of an EIS is appropriate. This is especially true given that the Eel River is designated under both State and Federal law as a Wild and Scenic River. *See* 40 C.F.R. § 1508.27(b)(3) (defining significance to include impacts to wild and scenic rivers).

The Conservation Groups also agree with the Commission that the EIS should be used to determine two things: (a) whether to issue a new hydropower license for the project; and, (b) if

---

[1] Currently, SD1 references a potential license term of 30 to 50 years. In order to have a complete and stable project description the EIS will of course need to specify a defined license term for the proposed Project.

so, under what conditions. *See* Cover Memorandum to SD1. We underscore that the first order of analysis that flows from this statement of intent is whether to issue a new license given the Commission's overarching public interest standard. "To argue otherwise would mean that the Commission would be powerless to carry out the comprehensive development function that is recognized as the central purpose of the Federal Power Act." *Edwards Manufacturing Co.,* 81 F.E.R.C. ¶ 61,255, 62,208- 09 (Nov. 25, 1997) (Order Denying New License and Requiring Dam Removal).

The Conservation Groups also appreciate the Commission's acknowledgment that SD1 is only a preliminary list of issues and alternatives to be addressed in the EIS. We offer these comments to assist in the further development of these lists and the scope of analysis. As set forth in further detail below, the EIS must analyze the full scope of the Project's site specific and cumulative impacts over the expected life of the Project. In addition to the subjects listed in SD1, such analysis must include consideration of known and projected information regarding dam safety (including issues related to the current status of the dams, geology, and soils) and climate change. Critically, the EIS's analysis must be considered in light of the environmental setting for the Project on the Eel and Russian Rivers.

Further, the EIS must analyze an adequate range of alternatives to the Project. However, the Conservation Groups are deeply concerned that SD1 has improperly and prematurely circumscribed the alternatives to be considered. For example, SD1 has excluded a decommissioning alternative from further consideration without regard to the factors set forth in FERC's guidelines. Nor does SD1 identify any other alternatives that are aimed at the recovery of listed fish species and protection of health and safety to be included in the environmental analysis. As discussed below, it is imperative that the EIS examine a decommissioning alternative as well as other alternatives in order to satisfy NEPA's requirements.

In conjunction with these comments, the Conservation Groups submit expert reports and requests for additional information from Greg Kamman of Kamman Hydrology & Engineering, Inc. ("Kamman Report") and Scott Stephens of Miller Pacific Engineering Group ("Miller Pacific Report"), which are attached, respectively, as Exhibits 1 and 2, and incorporated herein

by reference.

As set forth below in the Conservation Groups' comments on the PAD and in their Study Requests, both of which are incorporated herein by reference, the Conservation Groups believe that a number of additional studies will be required in order for the Commission to adequately conduct environmental review for the Project in compliance with NEPA. The Conservation Groups join in the study requests submitted by the resource agencies, and also list additional Study Requests below, which are included in Appendix A and incorporated herein by reference.

Finally, the Conservation Groups note that FERC held two scoping meetings for the proposed license renewal. Both were in Ukiah, California on June 28, 2017. While Ukiah is convenient to many stakeholders in the Russian River watershed who may have a financial interest in the continued operation of the Eel River dams and diversion, it is many hours drive from most population concentrations in the Eel River watershed. During scoping meetings for Klamath Dam relicensing, FERC held scoping meetings in Redding, Yreka, and Ashland, then added a meeting in Eureka in response to public demand. The Conservation Groups respectfully request that FERC convene a public scoping meeting in Eureka for this Project.

II. The Draft EIS Must Adequately Describe and Consider the Environmental Setting.

An evaluation of the environmental effects of a project requires that the Draft EIS consider not only the impacts of the project but also the setting in which those impacts will occur. In the present case, the Draft EIS must consider information regarding the environmental setting on both the Eel and Russian Rivers.

A. The Eel River Context

The Eel River holds special status and is subject to various protections under both state and federal law. As noted, with the exception of the upper mainstem above Cape Horn Dam, the entire Eel River watershed is designated a Wild and Scenic River under both the 1968 federal Wild and Scenic Rivers Act and under California's 1972 Wild and Scenic Rivers Act, which was passed to insure that "certain rivers which possess extraordinary scenic, recreational, fishery, or wildlife values shall be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state." CA Pub Res

Code § 5093.50 (2016). It should be apparent that the "recreational, fishery, [and] wildlife values" of the Eel River are knitted together around salmon and steelhead. The Wild and Scenic River designation has the primary consequence of barring the construction of dams and or diversion projects like Cape Horn and Scott Dams and the Potter Valley diversion works. If the Potter Valley Project and its structures did not exist or were removed, it is very likely that the outstanding resource values – particularly coldwater fisheries habitat – which led to the designation of the rest of the Eel River under the state and federal WSRAs would again be found in the upper mainstem as well.

Further, the Eel River is listed under §303(d) of the Clean Water Act for sediment and temperature throughout the watershed, and the Lake Pillsbury reservoir is listed for mercury.

Although it has lost some native species, the Eel River is still home to surviving native fish populations, which include sea-run salmonids (coastal cutthroat trout, summer steelhead, winter steelhead, coho salmon, fall-run chinook) as well as resident rainbow trout.[2]

CalTrout in conjunction with UC Davis recently published a study that details the status of all salmonids in California. Here, we highlight the status of anadromous salmonids found in the Eel River, all of which are listed as Threatened under the federal Endangered Species Act: California Coastal chinook, Coastal cutthroat trout, Northern California winter steelhead, Northern California summer steelhead, and Southern Oregon Northern California Coast Salmon (SONCC).[3] Coho salmon are also listed as Threatened under the California Endangered Species Act in the Eel River.

---

[2] Summer and winter steelhead, and rainbow trout are all classified as *O. mykiss*. The best available science indicates that summer and winter steelhead are genetically distinct. Both summer and winter steelhead can move to and from the resident rainbow trout life history. Rainbow trout in the mainstem Eel include both planted stocks in the Lake Pillsbury reservoir and native populations in the tributaries above the reservoir.

[3] Northern California steelhead were first listed as threatened in 1997 (62 FR 43937), a decision reaffirmed in 2006 (71 FR 834). California coastal chinook were listed as threatened in 1999 (64 FR 50394), and confirmed in 2005 (70 FR 37160).

We emphasize that the authors strongly suggest that current federal and state listing statuses do not accurately capture the level and nature of the threats that salmonids face in the Eel River. They assess California Coast Chinook at a "high" level of concern (2.9), but Southern Oregon/Northern California Coho, also listed as Threatened under the federal ESA, as facing a "critical" level of threat (1.7). Similarly, while the National Marine Fisheries Service ("NMFS") treats all steelhead in the Eel as a single entity, listed as Threatened, Moyle et al. assess Northern California Summer Steelhead as facing a "critical" threat level (1.9), while Northern California Winter Steelhead's situation is merely "moderate" (3.3). *See* Moyle, P., Lusardi, R., Samuel, P., and J. Katz. 2017. *State of the Salmonids: Status of California's Emblematic Fishes, 2017. 555 pp. San Francisco, CA.*

California Coastal chinook (2.9, High level of concern)

- "The CC Chinook ESU includes salmon that spawn in coastal watersheds from Redwood Creek (Humboldt County) to the Russian River (Sonoma County). In general, small coastal streams within this range can support CC Chinook salmon as long as they have open estuaries during peak migration times (fall through spring). In the Eel River watershed, CC Chinook salmon could historically access habitat up to natural boulder roughs on the upper mainstem Eel River, but they are currently blocked from accessing this habitat by Scott Dam and Lake Pillsbury (Lake County)."
- Threats include:
    - "Climate change is likely to lead to increased temperatures and reduced snowpack in the headwaters of the Eel River, which will make managing the release of cold water from dams and reservoirs to support salmonids even more difficult in the future."
    - "Scott Dam, Coyote Valley Dam, and Warm Springs Dam reduce water quality and quantity across the CC Chinook salmon range. The timing of water transfers from the upper Eel River into the Russian River watershed at Pacific

Gas & Electric's Potter Valley Project reduces habitat suitability for Eel River salmonids."

Coastal cutthroat trout (2.7, High level of concern)

- "Coastal Cutthroat trout range from Prince William Sound, Alaska, to tributaries of the Salt River (Eel River, Humboldt County). They inhabit most coastal tributaries of major rivers open to the sea and lagoons between the Smith River (Del Norte County) and the Eel River (Humboldt County) in a relatively broad band along the coast. However, updated distribution surveys are needed for this species, as they often inhabit disconnected headwater streams that are now upstream of man-made barriers such as dams, diversions, and culverts."
- Threats:
    - Coastal Cutthroat trout's reliance on cold, oxygenated water makes them extremely vulnerable to increased stream temperatures and variability in precipitation likely to occur as the climate changes. Recent drought has caused the juvenile migration peak to shift from June-July to May in Redwood Creek (Humboldt County), indicating rapid shifts to changing environmental conditions are possible.

Northern California winter steelhead (3.3, Moderate level of concern)

- "Northern California winter steelhead are in a state of long-term decline over much of their range due to land use practices that reduce habitat for juveniles, such as diversions that desiccate nursery tributaries during summer months."
- "The Northern California winter steelhead includes all naturally spawning populations in California coastal river basins from Redwood Creek (Humboldt County) to the Gualala River (Mendocino County). This distribution includes the Eel River, the third largest watershed in California, with its four forks (North, Middle, South, and Van Duzen) and their extensive tributaries."

- Threats:
    - "Northern California winter steelhead are highly vulnerable to climate change due to juvenile reliance on small, headwater tributaries for nursery habitat. Reductions in suitable coldwater are also expected to result in local extirpations and range contractions for NC steelhead, as higher gradient headwater streams that could provide refuge are inaccessible behind waterfalls, boulder fields, or dams."
    - "Scott Dam on the Eel River blocks access to an estimated 290 km (180 mi.) of potential habitat, while Matthews Damon the Mad River blocks nearly a third of historical steelhead habitat. In addition, these dams reduce streamflows during important migration windows for adult and juvenile steelhead."

Northern California summer steelhead (1.9 Critical level of concern)

- "Northern California (NC) summer steelhead are in long-term decline and this trend will continue without substantial human intervention on a broad scale. They are vulnerable to extinction by 2050 due to their reliance on cold water during the warmest months and are critically susceptible to climate change."
- "Historically, NC summer steelhead ranged from Redwood Creek (Humboldt County) in the north to the Mattole River (Mendocino County) in the south. Today, only a few select watersheds still support summer steelhead, including Redwood Creek and the Mad, Eel, and Mattole rivers. They can be found in the mainstem, upper mainstem, North, Middle, and South forks of the Eel River."
- Threats:
    - "Climate change is likely to alter precipitation and streamflows and lead to warmer temperatures, which reduces suitable habitat and places further stress on small populations of NC summer steelhead. Any reductions in streamflows or increases in water temperature are likely to disproportionately affect NC summer steelhead due to their run timing."

- "Scott Dam on the upper mainstem Eel River blocks access to an estimated 463 km (285 mi.) of potential spawning, migration, and nursery habitat, while Matthews Dam blocks over a third of potential steelhead habitat in the Mad River."

Southern Oregon and Northern California coast coho salmon (1.7, Critical level of concern)

- "Southern Oregon/Northern California Coast Coho are critically vulnerable to extinction as wild fish within the next 50-100 years. There has likely been 95% or more decline in numbers since the 1960s in California due to dam construction and habitat degradation from various land use practices."
- "SONCC Coho salmon are distributed widely across the North Pacific, from northern Japan to California. SONCC Coho are found in the Rogue River (Oregon) to the Mattole River (Mendocino County). Historically, SONCC Coho occupied numerous coastal basins with high quality habitat in the lower portions of watersheds."
- Threats:
  - "Climate change will lead to increased stream temperatures, more frequent and prolonged drought, and reduced streamflows that will negatively impact survival of SONCC Coho in the future."
  - "Irrigation diversions in many streams reduce flows during critical juvenile growth and feeding periods in the summer months, especially from illegal marijuana cultivation."

The Eel is also still home to its namesake fish, the Pacific Lamprey. Lamprey are not yet listed under the federal ESA, though their populations on the West Coast have suffered declines as severe as salmonids, which have received ESA protection. This decision reflects substantial differences between lamprey and salmonid reproductive and evolutionary biology: where salmon adapt to specific streams, and display astonishing fidelity in returning to their natal waters, adult lamprey return to freshwater streams that contain the pheremone signature of

juvenile lampreys. Thus, the West Coast population of lamprey does not appear to display the same level of adaptive variation as salmon.

However, lamprey appear to be more vulnerable to some forms of anthropogenic disturbance than salmonids. Their filter-feeding juvenile stage, the ammocoete, remains buried in stream substrates for multiple years, where they are particularly vulnerable to drought. The ammocoete stage appears to be especially prone to accumulating mercury in higher levels than even other filter feeders. This means both that ammocoetes may be a good way to characterize mercury contamination issues in the upper Eel, but they may also be at significant risk from that mercury burden.

The last relicensing for the Project took place against a backdrop of rising concern about the decline of salmon and steelhead in the Eel River and across the West Coast. After Eel River steelhead and chinook were federally listed, the National Marine Fisheries Service ("NMFS") shortly determined that continued operation of the Eel River dams and Potter Valley diversion tunnel under the then-existing flow release schedule threatened to jeopardize chinook salmon and steelhead in the Eel River. (NMFS, Biological Opinion for the proposed license amendment for the Potter Valley Project, 2002.) That is to say, chinook and steelhead were at risk of being driven to extinction in the mainstem Eel River by dam and diversion operations.

Dam operations and diversions were thereafter constrained by the Reasonable and Prudent Alternative ("RPA"), which was recommended in the 2002 NMFS Biological Opinion, and later adopted by FERC in 2004 as part of the PVP operating license. The RPA imposed flow schedules for the mainstem Eel River (varying by the type of water year and time of year) and required additional mitigation measures. While the RPA has insured higher summer flows in the mainstem Eel below the dams than were required under the previous license, it has now become clear that the RPA will never be fully and successfully implemented.

As is clear in the FERC record for the Project, the historic drought of the last five years, and the buildup of silt in the Lake Pillsbury reservoir behind Scott Dam, together with unanticipated weaknesses in the infrastructure of the dam itself, resulted in the dam operator being unable to meet the RPA's flow targets for dry season flows in successive years. These

flows are important to assist upriver migration, especially of adult chinook salmon.

As well, the RPA required that the dam operator undertake mitigation efforts to reduce the incidence of pikeminnow, an invasive species that benefits from the slower, warmer waters created by the dams, and which preys on both chinook and steelhead juveniles. Unfortunately, the combination of threatening interference from illegal marijuana growers and the potential for pikeminnow control techniques to harm listed steelhead have thus far resulted in the lack of implementation of pikeminnow control programs. Indeed, PG&E has effectively abandoned these RPA requirements, leaving Eel River salmonids in further jeopardy.

Thus, the RPA has never been, and is not expected to be, fully implemented. Because the RPA was required in order to prevent the risk of jeopardy to the Eel River's fisheries caused by the Eel River dams, this leaves the Eel River's ESA-listed fish struggling to survive without even the minimal level of support that NMFS had determined the fish require to avoid the threat of extinction created by the diversion of water to the Russian River and the dams built to facilitate it.

Thus, greater provisions for fisheries will probably need to be made in future than has been made to date. Meanwhile, the system is steadily losing, not gaining, flexibility to meet such needs in future years.

Whether the RPA restrictions have been adequate to provide necessary protections for Eel River fisheries, they have clearly dramatically affected power production and diversion for consumptive use in Potter Valley and the Russian River.

While we are not privy to PG&E's accounting of the maintenance costs associated with the Eel River dams and Potter Valley diversion works, we have reason to believe that they are relatively high as a function of the actual power production associated with the PVP. Such a cost-benefit analysis of PVP power production would also have to take into account the seasonality and nature of the power which the PVP does produce under current operational procedures.

As discussed more fully below, we have a number of concerns about the safety and reliability of the Eel River dams, particularly with respect to seismic stability generally, and with

conditions around the left abutment of Scott Dam. Those questions raise additional substantial issues with respect to the potential costs and benefits associated with the Eel River dams and Potter Valley diversion.

On virtually every front, then, it is evident is that the status quo is not viable.

B. The Russian River Context

At the same time that is clear that the Eel River and its fisheries have historically lacked and currently lack sufficient flows under Project operations, NMFS has found that listed fish species in the Russian River have been harmed by flows that are too high. *See* NMFS Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River watershed (September 24, 2008) ("Russian River Bi-Op"). As a result, the Sonoma County Water Agency ("SCWA") has proposed modifications to the State Water Resources Control Board's ("State Board") Decision 1610 ("D-1610"), which controls flows in the Russian River.

SCWA's proposal is currently undergoing CEQA review. *See* SCWA, Draft Environmental Impact Report for Fish Habitat Flows and Water Rights Project (SCH #2010092087) ("Fish Flow DEIR"). As detailed in SCWA's Fish Flow DEIR and FOER's comments thereon, *there is insufficient evidence to support the hypothesis that diversions from the Eel River through the PVP are necessary for the protection of aquatic species or recreational resources on the Russian River*.[4] Further, SCWA is proposing a new hydrological

---

[4] The Fish Flow DEIR is available at http://www.scwa.ca.gov/files/Fish%20Flow%20DEIR%20Full%20Document.pdf the Errata at http://www.scwa.ca.gov/files/FishFlow_DEIR_Errata_012617_FINAL_Remediated.pdf (footnote continued)

index for its operations on the Russian River; in this index, the proposed water year types (or "schedules") are no longer tied to inflows to Lake Pillsbury. The Draft EIS for the Project must take this environmental setting and SCWA's proposed changes to D-1610 into account in assessing the Project's environmental impacts. As noted in the PAD (PAD 4-42), the last amendment to the Project's license, Article 58, states that "FERC reserves authority to require modifications to the Project license as may be necessitated by modification by the California State Water Resources Control Board of its Decision 1610."

The EIS should also include a detailed description of the water rights associated with the Project. While SD1 generally describes PG&E's claimed water rights, it does not provide data or evidence of PG&E's actual beneficial use of water. Nor does it discuss PVID's contract for irrigation purposes based on actual water rights, or the legal status of the Project's abandoned water in the Russian River. *See* PAD comments, *infra*. Understanding Project water rights is critical to an adequate evaluation of the Project's impacts and feasible mitigation measures and alternatives. Not only must the EIS consider the relative values and efficiencies of the various uses of finite water resources, but the agency must also evaluate whether alternative sources of water could supply those uses, or whether alternative uses could secure substantial benefits while using significantly less water.

III. The EIS Must Include a Larger Geographic Scope of Project Review.

The Conservation Groups believe SD1 improperly limits the geographic scope for Project analysis. For the Eel River, SD1 limits the geographic scope to the River from Lake Pillsbury downstream to the confluence with the Middle Fork Eel River. In the last sentence of last sentence in Section 3.3.3, the PAD states, "*Below the Middle Fork Eel River, potential hydrologic effects of the Project are significantly diminished due to inflow from the Middle, South and North Forks of the Eel River, and the Van Duzen River*." As noted in the Kamman

---

Friends of the Eel River's comments on the Fish Flow DEIR can be found at https://eelriver.org/wp-content/uploads/2017/04/FishHabitatFlowsDEIR-FOER_Comments-0309017.pdf.

Report (Exhibit 1 at pp. 4-6), this statement fails to take into account that increasing summer water demands along the entire Eel River and tributaries has led to serious concerns about the direct and cumulative impacts of summer diversions, especially to listed salmonids. Moreover, blockwater releases in late summer 2014, intended to help keep temperatures down for juvenile steelhead in the upper river, actually reconnected surface flows at the mouth of the Eel. Thus, Project operations clearly do affect river conditions as far down as the mouth during the summer dry period. Consequently, the Conservation Groups request that the EIS expand the geographic scope of Project analysis to include the Eel River from the Project area to the Pacific Ocean.

The scope of analysis on the Russian River should also be expanded. SD1 currently limits the scope for the assessment of water quality and fishery resources to the East Fork Russian River from the PVP powerhouse to the Lake Mendocino. SD1 at p. 17. However, given the dependence on Lake Mendocino water in meeting Russian River minimum instream flow thresholds and associated aquatic habitats, it seems logical that any potential changes to PVP operations would potentially have an impact on the Russian River down to the confluence with Dry Creek. Below Dry Creek, Lake Sonoma also supplies flows necessary to meet Russian River minimum flow needs. Thus, the Conservation Groups ask that the geographic scope on the Russian River be expanded to at least Dry Creek, and that all relevant information be considered.

IV. The EIS Must Undertake an Adequate Evaluation of the Project's Impacts Over the Expected Life of the Project.

The EIS must undertake a comprehensive and detailed evaluation of the Project's potential environmental impacts, identification of mitigation measures for those impacts, and formulation of alternatives to the Project that would involve fewer and less severe environmental impacts. The purpose of NEPA is to "promote efforts which will prevent or eliminate damage to the environment and biosphere." 42 U.S.C. § 4321. NEPA's fundamental purposes are to guarantee that: (1) agencies take a "hard look" at the environmental consequences of their actions before these actions occur by ensuring that the agency carefully considers "detailed information concerning significant environmental impacts," *Robertson v.*

Methow Valley Citizens Council, 490 U.S. 332, 349 (1989); and (2) agencies make the relevant information available to the public so that it "may also play a role in both the decision-making process and the implementation of the decision." *Id*.

NEPA emphasizes "coherent and comprehensive up-front environmental analysis" to ensure an agency "will not act on incomplete information, only to regret its decision after it is too late to correct." *Blue Mountains Biodiverisity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998), cert. denied, 527 U.S. 1003 (1999) quoting *Marsha v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989); *see also Foundation on Economic Trends v. Heckler*, 756 F.2d 143, 157 (D.C. Cir. 1985) ("The NEPA duty is more than a technicality; it is an extremely important statutory requirement to serve the public and the agency *before* major federal actions occur.") (emphasis in original).

Critically, the EIS may not assume, as currently stated in SD1, that because the proposed Project is the same as the "no-action alternative," that there would be no change to the environment and that "[n]o new environmental protection, mitigation, or enhancement measures would be implemented." SD1 at p. 6. Even though the EIS plans to utilize the existing conditions under the license to establish a baseline, it must still evaluate the environmental impacts of continued Project operations *over the expected life of the Project* (e.g., another 50 years).

The Project involves a host of potentially significant impacts, which will likely progressively increase over the life of the Project as dam safety issues and climate change worsen. As set forth below, in addition to the issues listed in SD1, the EIS should evaluate the Project's impacts to public safety, geology, and soils; the Project's useful lifespan; how climate change may alter the Project's environment and operations; and how the Project itself may contribute to climate change. The EIS must disclose and analyze these impacts fully and minimize or eliminate them to the extent feasible.

A. Public Safety, Geology and Soils

SD1 addresses dam safety entirely as a constraint on mitigation or modification of existing structures:

"As the proposal and alternatives are developed, the applicants must evaluate the effects and ensure that the project would meet the Commission's dam safety criteria found in Part 12 of the Commission's regulations and the engineering guidelines."

However, because of the significant structural, geotechnical, and seismic issues presented especially by Scott Dam and its setting, FERC must consider dam safety issues directly as a central issue in this relicensing process.[5] FERC must consider, analyze, and disclose information bearing on the capacity of Scott Dam to withstand any or all of the combination of structural, geotechnical, and seismic events which might reasonably be expected to occur. FERC must consider whether Scott Dam can be retrofitted, reconstructed, reinforced, or safely dismantled (in whole or in part) to compensate for potential hazards which can be identified by such a careful analysis.

FERC must also consider and update the Dam Failure Inundation Study for both Scott Dam and Cape Horn Dam. In the event of dam failure, Scott Dam would release a wall of water downstream, causing immeasurable harm and damages. PG&E's Dec. 1, 1993 *Civil-Hydrologic Engineering Inundation Study* indicates a Peak Maximum Flood at dam-break conditions of 875,000 cfs just below Scott Dam.[6] At Fortuna, the front-of-wave arrival is 8 hours 36 minutes after dam break, with a maximum discharge of 1,220,600 cfs, at a maximum stage of 64.4 ft. arriving approximately 13 hours after dam break.

FERC comes to the question of relicensing the Eel River dams in the immediate aftermath of a near-disaster at Oroville Dam and a series of revelations that raise significant questions about the adequacy of dam safety review by both FERC and the California Division of Safety of Dams (DSOD). What is apparent to the public and policy makers is that dam safety at FERC-jurisdictional dams is not assured by current licensing and inspection procedures.

---

[5] See, e.g., Melosh, G., *Geologic Risks at the Potter Valley Project* (July 20, 2017), available at https://drive.google.com/file/d/0B8LzWutg0vukcWpsbEJycFlLbTg/view?usp=sharing

[6] PG&E 1993 Civil-Hydrologic Engineering Inundation Study available at https://drive.google.com/file/d/0B0CHJ_mE5vWeY3JMWkl1TmEwM1U/view?usp=sharing

In the aftermath of the Oroville crisis, catastrophic risk assessment expert Robert Bea called the near-disaster "a regulated failure."[7] Bea told KQED that the Division of Water Resources "and other oversight bodies, such as the Federal Energy Regulatory Commission, are using standards that don't account for the deterioration of infrastructure over time or outdated technology." Prof. Bea wrote "it is likely that the wrong standards and guidelines are being used to re- qualify many critical infrastructure systems for continued service. The majority of these standards and guidelines were originally intended for design, not re-qualification or re-assessment of existing aged infrastructure systems that have experienced 'aging,' 'technological obsolesce,' and increased risk (likelihoods and consequences of major failures) effects. Inappropriate standards and guidelines are being used to re-qualify these infrastructure systems for continued service."[8]

The Oroville events and Prof. Bea's assessment of the adequacy of regulatory standards and guidelines used to determine and assure dam safety demonstrate that it is incumbent on FERC to reassess those standards and to assure that it is applying the appropriate level of scrutiny to the questions surrounding the safety of the present Project. FERC can and must consider dam safety as a distinct question in each dam relicensing process. It is not enough to suggest that routine safety inspections and reviews are adequate to assure dam safety when it is evident that such reviews and inspections have failed to reveal critical underlying weaknesses in design, engineering, and construction of significant structures.

Indeed, if the broad purpose of relicensing is to determine whether a hydropower dam produces societal benefits in excess of its net burdens – whether the power it produces is worth the costs to things we care about in addition to electricity – then questions around the safety of dams, the liabilities which might result from their failure, and the costs of correcting those issues

---

[7] See https://ww2.kqed.org/news/2017/04/18/report-design-building-and-upkeep-flaws-led-to-oroville-spillway-failure/.

[8] See *Preliminary Root Causes Analysis of Failures of the Oroville Dam Gated Spillway* R. G. Bea Center for Catastrophic Risk Management University of California Berkeley April 17, 2017.

are precisely the sort of information we should be considering. It is clear that dam safety issues, which could result in failures that harm the entire ecosystem, constitute potentially significant environmental impacts that must be evaluated in an EIS.

And safety issues are hardly theoretical for the Eel River dams. When the Eel River dams were built, the theory of plate tectonics was as yet unaccepted. It was only in later generations that we came to understand that many of the places that seem like excellent places to build dams are where river canyons cross faults. As the two sides of the fault slip against one another, the canyon narrows at the fault. The Scott Dam is one of the dams that, we have come to understand, were built dangerously close to such unstable areas.[9] Scott Dam's design was altered mid-construction to accommodate the collapse of rock structures on its left embankment. The area remains under close scrutiny today for its uncertain geologic stability. Given that Scott Dam is almost 96 years old, and that Cape Horn Dam is 109 years old, it would be folly to assume that there will be no required changes to Project structures or operations to address current conditions.[10]

Further, there are reasons to be concerned about potential hazards presented by the Project's infrastructure itself. For example, at present only one of the slide gates controlling releases over the top of the dam is automated. The other gates must be opened manually. Because operators are normally not present at the dam, there are a number of contingencies that could prevent operators reaching the gates to open them manually. Additionally, there is no backup power source available to operate the radial gate in the event of power failure to Scott

---

[9] *See* Engineering Report and PVP Earthquake Reports, submitted as Exhibits 2 and 7 in FOER's comments on the Fish Flows DEIR, and available at https://eelriver.org/2017/03/10/comments-on-draft-eir-for-fish-habitat-flows-and-water-rights-project/.

[10] *See, e.g.*, the photographic documentation of Scott Dam's construction, submitted as Exhibit 5 in FOER's comments on the Fish Flows DEIR, and available at https://eelriver.org/2017/03/10/comments-on-draft-eir-for-fish-habitat-flows-and-water-rights-project/

Dam. There is also no remote operational capability for any of the radial or slide gates. If the gates are closed and the automatic gate does not work for any reason during a high flow event, there is potential for a hazardous overtopping spill event.

Whether the mechanism is earthquake, storm, or failure of the dam itself, the EIS should analyze what the impacts of full or partial failure of Scott Dam would be on the Eel and its fisheries.[11] For example, if a complete failure were to happen while adult salmon were spawning, or redds were in the river, it could negatively impact a whole year's run of fish. Further, if the sediment backed up in the Lake Pillsbury and Van Arsdale reservoirs were to be unevenly distributed in the wrong parts of the mainstem, that would release sediment that could harm spawning or egg incubation.

1. Significant Information and Data Gaps Exist.

In the era after the Oroville Dam spillway incident, the Scoping Document 1 (SD1) as well as PG&E's Pre-Application Document (PAD), fail to consider and address critically important aspects and concerns about Scott Dam and Cape Horn Dam. The PAD identifies *no* "Potential Information Gaps" nor "Potential Studies to Address Identified Significant Information Gaps" related to dam safety, stability, reliability or liability.

The EIS for the Project must address the following data gaps (which run through the PAD and the Scoping Document 1):

- **Safety** of the dams and Project to residents, businesses, recreational and commercial users and water craft on the Eel River and Lake Pillsbury, tourists and visitors, as well as public and private property losses and damages.
- **Reliability** of PVP as a power generating source for PG&E and its customers; water

---

[11] The substantial impacts and scope of dam failure to people, businesses, roads, bridges, and other infrastructure located downstream are addressed in the failure analysis of PG&E's Emergency Action Plans. *See* Scott Dam Geotechnical Instrumentation Additions, Emergency Action Plans, and "Downstream Flooding Due to the Hypothetical Failure of Scott Dam," PG&E, available at PVP Inundation Study 1981-1994 - https://drive.google.com/file/d/0B0CHJ_mE5vWeY3JMWkl1TmEwM1U/view?usp=sharing.

supply for downstream Eel River water diverters as well as for East Branch Russian River diverters (municipal, agricultural and residential); and flows for fish, wildlife, botanic and aquatic habitat in both the Eel and Russian Rivers.

- **Liabilities** that would accrue to PG&E, FERC and others as a result of dam failures, with consequent potential loss of life, property, access and business interruptions.
- **Additional problems and issues:** There are other missing pieces of data and reliable, valid information necessary for an informed decision-making process for relicensing the dams for another 50 years. These include:
- complete data and modeling for the potential maximum flood event;
- engineering and corrections to erosion at the left and right abutments due to splashing and overtopping of the retaining walls;[12]
- without a spillway, there is no designed structure to ensure dam safety in the event of flood flows in excess of the capacity of the gates, or in the event that the gates become inoperable;
- design and construction corrections to address water releases or overtopping during periods of gate failure, potentially from debris, loss of power (with no or failed backup power generation onsite);
- inability of PG&E operators to reach the dam and manually operated gates due to road blockage or washout in both directions or during severe weather (*see* Exhibit 2);
- clogging or blocking of the needle valve or "grizzly" inlet structure by debris or

---

[12] See, e.g. Hinton, Hughes, Zapel 2015, *"Scott Dam Spillway – Comparing physical model study results"* Northwest Hydraulic Consultants, available at http://www.nhcweb.com/upload/news/Scott_Dam_Spillway_-_HydroVision_2015_-_R1.pdf The study "evaluates the performance of the training walls and describes the balancing act between achieving the necessary discharge capacity of the spillway crest and preventing overtopping of the training walls." The authors note that "(p)otential concerns regarding spillway capacity and structural stability of the spillway chute training walls under high flow and potential overtopping conditions have been identified." Additional studies, and reinforcing protection to guard against erosion, are recommended.

reservoir sediments. PG&E does not have any means or plan for clearing blockages and getting water past Scott Dam if the needle valve fails to function properly. This could be devastating to fish migration during critical periods, particularly dry season flows where interruption of releases from Scott Dam could easily result in fish kills in the reach between Scott Dam and Cape Horn Dam, and below Cape Horn Dam in the mainstem Eel River. To assess needle valve performance, the EIS must analyze and disclose what minimum water storage elevations behind Scott Dam are required to maintain Project operations;

- Sediment loading on the upstream face of Scott Dam has not been evaluated for potential sliding analysis and lateral displacements (*see* Exhibit 2 at p. 1); and
- PG&E organizational structure and culture have been noted as factors of concern by the California Division of Safety of Dams.[13] The California Public Utilities Commission Safety and Enforcement Division reports:

> "To get a better understanding of PG&E's dam safety issues, Staff met with the California Division of Safety of Dams (DSOD) in January 2016. DSOD explained some of the challenges it encounters with dam operators in California. Specifically with respect PG&E's dam risk management program, DSOD expressed concerns with delays in dam mitigation work, and with PG&E's Energy Supply's organizational structure that organizes the mitigation work.
>
> DSOD based this, in part, upon its assessment of two aspects of PG&E's dam risk management program:
>
> 1. PG&E appeared to lack a structured risk portfolio management program to assess, rank, and effectively mitigate risks at its dams in a timely manner. DSOD considers development of a comprehensive risk portfolio an

[13] *See* Safety and Enforcement Division Risk Assessment Section Staff Report, Pacific Gas and Electric Company (PG&E), 2017-2019 General Rate Case Application A.15-09-001, March 7, 2016. p 63. Available at www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=10180

> emerging best practice, and a more effective approach for ensuring mitigation of dam risks.
>
> 2. Although PG&E has hired additional staff, its current organizational structure generally impeded expedient and accountable mitigations of issues pertaining to inspections, dam-related assessments, and design/construction projects. PG&E assigns licensing coordinators to interface with regulators and inspectors. Since these Licensing Coordinators generally do not have a dam engineering background, they must arrange for the necessary engineering support to respond to issues raised by DSOD's engineers. DSOD found the current structure generally leads to a reactive culture rather than a proactive one. DSOD considers permanent assignment of an engineer responsible for specific dams to be a more effective and accountable best practice. DSOD has found operators that engage in that practice are more proactive in addressing and mitigating risks."

There are no references to any public or proprietary data, studies, conclusions or warnings from FERC's Potential Failure Mode Analysis (PFMA), nor to any reports from PG&E or from FERC's Dam Safety Performance Monitoring Program. The EIS must disclose whether PG&E or its agents have received any public funding, grants, loans technical assistance or other support to address safety, failures, reliability, repairs, maintenance, research or other related costs for the Potter Valley Project. If so, we request that the EIS identify when, for what purposes, related costs, results, and whether the work was completed.

By omitting any references or data at SD1 §3.3, and stating that there are no 'Geologic or Soils Resources' issues, despite what information is already known to the public, SD1 is inadequate and misinforms the public. It is critical that FERC and PG&E address the risks of continued operation of Scott and Cape Horn Dams and their related reservoirs and infrastructure

of the PVP.[14]

2. FERC Should Re-Designate Relevant Safety Information Currently Hidden from Public Review as CEII.

Unfortunately, the classification of certain documents as Critical Energy Infrastructure Information (CEII), which prevents their ordinary dissemination to the public, prevents adequate disclosure and analysis of relevant information, data, analyses, and documents related to dam safety, without providing any real benefit to public safety. The public, including scientists and engineers, stakeholders, downstream and upstream residents, businesses, public and private property owners, and those pursuing continued water transfers from the Eel River to the Russian River, are left in the dark, to no one's benefit.

In investigating the causes of the failure of the Oroville dam spillway, Prof. Bea found his analysis cut short by the refusal of DWR staff to provide documents essential to a complete assessment. "As (the Oroville Dam spillway) near-catastrophe unfolded, Bea said in interviews, he began assembling materials to try to explain it. He says the Department of Water Resources

---

[14] PG&E's San Bruno pipeline disaster may also be informative here. PG&E has issued a public response, stating:

"On September 9, 2010, PG&E learned a tragic lesson we can never forget.

This gas pipeline ruptured in San Bruno.

The explosion and fire killed eight people.

PG&E was convicted of six felony charges including five violations of the U.S. Pipeline Safety Act and obstructing an NTSB investigation.

PG&E was fined, placed under an outside monitor, given five years of probation,

and required to perform 10,000 hours of community service.

We are deeply sorry.

We failed our customers in San Bruno.

While an apology alone will never be enough, actions can make PG&E safer.

And that's why we've replaced hundreds of miles of gas pipeline, adopted new leak detection technology that is one-thousand times more sensitive, and built a state-of-the-art gas operations center.

We can never forget what happened in San Bruno.

That's why we're working every day to make PG&E the safest energy company in the nation."

rebuffed a request for original design documents of the spillway and adjacent emergency weir. DWR representatives told him that agency guidelines barred the release of information on critical infrastructure systems — data protected by a post-9/11 law designed to prevent such resources from falling into the hands of potential attackers. "They looked at me and smiled and said, 'You might be a terrorist,' " Bea recalls."[15]

Although some information may be obtained if the requesting party signs a non-disclosure agreement ("NDA"), this process is largely useless in the scoping process as the NDA prevents that party from discussing their findings in a public setting.

As with Oroville Dam's complex problems, which were ignored, FERC and other agencies and PG&E cannot afford to repeat the kind of errors and omissions of data and information critical to peer review, scrutiny, analysis and recommendations.

CEII is defined as:

Information concerning proposed or existing critical infrastructure (physical or virtual) that:

1. Relates to the production, generation, transmission or distribution of energy;

2. Could be useful to a person planning an attack on critical infrastructure;

3. Is exempt from mandatory disclosure under the Freedom of Information Act; and,

4. Gives strategic information beyond the location of the critical infrastructure.

https://www.ferc.gov/legal/ceii-foia/ceii/guidance-dam.pdf Jan. 12, 2005

The current Designation of Incoming Dam Safety Documents (see, https://www.ferc.gov/legal/ceii-foia/ceii/designation.asp) allows the following items to be hidden behind CEII classifications:

Dam Safety: Design Report; Engineering Analysis [excepting Exemption from P12d Request Letter]; Engineering Evaluation; Part 12.10(a) Incident Report; Part 12D Consultant Inspection Report; Board of Consultants Report; Instrumentation Report; Potential Failure Mode

---

[15] https://ww2.kqed.org/news/2017/04/18/report-design-building-and-upkeep-flaws-led-to-oroville-spillway-failure/.

Analysis; Supporting Technical Information; Part 12D Consultant Resume for Approval

Emergency Action Plans: Annual EAP Update; 5-Year EAP Submittal [excepting Annual review of conditions for EAP exemption]; EAP Submittal; EAP Func. Exercise Critique Report

Hazard Classification: EAP Dambreak Report.

Construction: Design Report; Plans and Specifications; Cofferdam Report; As-Built Drawings [excepting Decommissioning Study/Report]; Foundation Report; Blasting Plan.

The Federal Power Act states that FERC, or the Secretary of Energy "shall remove the designation of [CEII], in whole or in part, . . . if [FERC] . . . determines that the unauthorized disclosure of such information could no longer be used to impair the security or reliability of the bulk-power system or distribution facilities," or "any other form of energy infrastructure." 16 U.S.C. § 824o-1(d)(10); 18 C.F.R. § 388.113(e)(2). FERC can "make determinations with regard to any claim of CEII status at any time . . .." 18 C.F.R. § 388.113 (d)(1)(v). Thus, the Commission can and should remove the CEII designation for information relevant to the EIS analysis so that the public may fully be able to participate in the environmental review process. Indeed, the Conservation Groups believe there is a far greater safety risk from *not* releasing this information than there is from revealing it to the public.

At a bare minimum, though, FERC must make it clear how it will incorporate dam safety, partial and full failure analyses, disaster planning, potential mitigations and corrections, liabilities and desires for reliability into a public process. This process must occur early in the relicensing and NEPA review process, while the potential decisions are still flexible enough for changes, so as not to impair FERC from properly and responsibly doing its job.

3. Bartlett Springs Fault Zone includes Scott Dam and Lake Pillsbury, and must be considered in assessing the stability and safety of the Potter Valley Project.

While the PAD (§ 5.6) does note the presence at the Project site of the nearby Bartlett Springs Fault (§ 5.6.5.1) as the northward continuation of the Calaveras-Green Valley fault system, neither the PAD nor SD1 discuss any impacts of the fault's potential movement on the stability and safety of the PVP's dams, particularly Scott Dam and Lake Pillsbury. However,

FERC did issue a June 15, 2017 request to PG&E to "complete the investigation and associated analyses necessary to characterize the Bartlett Springs Fault…"[16] This is information should be included within the EIS. There is also no discussion of flooding or other impacts that might result from dam failure. This information should likewise be included in the EIS.

On August 10, 2016, an earthquake M5.1 magnitude occurred 10 miles south east of Scott Dam, with some 93+ aftershocks M3.0 or greater, and offsets measured at 5-10mm. PG&E's report on the incident indicates that the fault is capable of M6.0-7.4 earthquakes.

Given the age and construction of Scott Dam, this information is critical for the public and engineering understanding for its future.

4. SD1 Omits Consideration of the Hayward Fault.

According to recent work by the US Geological Survey, Rodgers Creek Fault may be a northern extension of the Hayward Fault. *See* Exhibit 2 (Miller Pacific Report) at p. 2. No information about this discovery is provided in the PAD or SD1. With a potential doubling of its length, the fault would be capable of larger earthquakes than previously assessed. Thus, expected ground motions must be re-analyzed for lateral deformations and potential failure of Scott Dam.

The EIS should fully explain how PG&E and FERC have carefully considered the potential for earthquakes to cause partial or complete failure of Project infrastructure, including the potential for seismic triggering of known and suspect areas of geologic instability.

5. Design and construction problems are known to exist at PVP, yet neither the PAD nor SD1 acknowledge any issues to be considered within the relicensing process.

Scott Dam is a textbook example of construction of a vulnerable structure's foundation on "bimrock": block-in-matrix geology, mixtures of stronger blocks of rock surrounded by weaker bonded matrix rocks of finer texture. Scott Dam was intended in 1921 to go straight across the Eel River valley to impound the waters of Lake Pillsbury. However, during the

---

[16] See http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20170628-0278

construction interval in the winter of 1921-22, the large outcropping of greenstone (the "knocker"), believed to be bedrock and intended to become the south or left abutment of the dam, moved in winter Eel River flood flows, dropping some 60' in elevation.[17]

Rather than relocate the dam to a more stable location, builders simply built an angle in the dam's foundation and face, in order to bypass the "knocker" and connecting to the bank downstream of the moving boulder. This long hillside at the left abutment continues to slide and creep today, as it no doubt did, undetected, for many years prior to dam construction. The SD1 and PAD fail to mention continued movement of this landslide, or of the associated foundation instability concerns at the left abutment. *See* Exhibit 2 (Miller Pacific Report) at pp. 2-3. The EIS must analyze the potential for damage to Project infrastructure and operations from this unstable area.

It is unknown to the public, geotechnical and engineering communities whether this moving material is putting lateral pressure on the dam beyond its design and construction capabilities, where it essentially acts as a strut across the valley. It is also not known if the foundation of the dam actually rests solidly on bedrock, and if the moving slides could uplift the dam by flowing or moving underneath the dam's foundation under adverse conditions, such as earthquakes or saturated slopes, leading to partial or total failure. Further, several modifications have been made to Scott Dam over the years, adding another element of uncertainty as to the structural integrity of the dam. An assessment must be made as to the overall current safety of the dam.

In sum, dam safety issues are highly relevant—indeed, critical—to FERC's consideration of a Project license. FERC must consider all relevant safety data, provide an adequate safety evaluation in the EIS, and consider feasible mitigation measures and alternatives that could

---

[17] See the photographic documentation of Scott Dam's construction, submitted as Exhibit 5 in FOER's comments on the Fish Flows DEIR, and available at https://eelriver.org/2017/03/10/comments-on-draft-eir-for-fish-habitat-flows-and-water-rights-project/

minimize the dam safety risks that currently exist at the Project site. FERC must explain the risks and hazards associated with the Project in easily understood language.

B. Climate Change

Pursuant to CEQ guidance[18], FERC must consider the effects of climate change as they relate to the proposed relicensing. These will include potential and probable changes in precipitation, hydrology, stream flows, and potential water yield, as well as potential effects on energy production and fisheries. FERC cannot adequately consider the potential effects, including cumulative effects, of the proposed fifty-year license renewal without carefully reviewing projected changes in environmental conditions in the project region which are certain to affect project operations and public trust resources.[19]

Furthermore, a new study in BioScience Volume 66 Number 11 brings new information to light about greenhouse gas emissions from reservoir water surfaces, concluding that methane accounts for 79 percent of carbon dioxide equivalent emissions from reservoirs, and those reservoir emissions may have been underestimated.[20] Hydropower is considered a low-carbon technology, however this new study suggests that some reservoirs in certain conditions can release quantities of methane, a greenhouse gas, and/or act as carbon sinks. FERC should therefore also consider whether the Eel River dam reservoirs should be evaluated as a source of elevated methane emissions.

---

[18] Council on Environmental Quality, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. August 1, 2016.

[19] See, e.g. Palmer, M.A., Lettenmaier, D.P., Poff, N.L., Postel, S., Richter, B., and R. Warner. 2009. Climate Change and River Ecosystems: Protection and Adaptation Options. Environmental Management 44:1053-168.

[20] *Greenhouse Gas Emissions from Reservoir Water Surfaces: A New Global Synthesis Bridget R.* Deemer, John A. Harrison, Siyue Li, Jake J. Beaulieu, Tonya DelSontro, Nathan Barros, José F. Bezerra-Neto, Stephen M. Powers, Marco A. dos Santos, and J. Arie Vonk.

V. The DEIS Must Analyze an Adequate Range of Alternatives to the Project, Including a Decommissioning Alternative.

NEPA requires that an agency "rigorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 1502.14(a). Consideration of alternatives is "the heart" of an EIS because it compels agencies to "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public." *Id.; see also* 40 C.F.R. § 1508.9(b). Fundamentally, an agency must "to the fullest extent possible . . . consider alternatives to its action which would reduce environmental damage." *Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n* (D.C. Cir. 1971) 449 F.2d 1109, 1128.

Thus far, SD1 only mentions two "alternatives:" the "No–Action Alternative" and PG&E's Proposal. The No-Action Alternative is continuation of existing license terms. PG&E's proposal, for now, is also continuation of existing license conditions, although PG&E recognizes that it may include additional PM&E measures during the proceeding. SD1 states that staff propose to eliminate several options from detailed study, including Federal Government Takeover, Non-Power License, and Project Decommissioning. SD1's approach to the alternatives analysis is far too narrow for this Project.

As discussed above, there are several elements of the RPA that are not working as intended. For example, PG&E has had to repeatedly request variances to the flow regime due to the drought and structural conditions. And the pikeminnow suppression program has been effectively abandoned. Furthermore, conditions in the area continue to change as drought and climate change affect the region, and illegal diversions continue to rise. Given that NMFS stated at the time of the last license amendment that full implementation of the RPA was necessary to avoid an unlawful taking of endangered species under the ESA, continuation of the status quo will not meet the requirements of the ESA. Therefore, the EIS should evaluate additional alternatives beyond the status quo. Each alternative should provide a flow regime and/or other project components that ensure (1) the survival and recovery of listed Eel River fish species, and (2) to the extent that dam structures remain, that those structures are able to be safely operated

over the life of the Project.

Additional alternatives evaluated in the EIS should include, but are not limited to:

1. **Project Decommissioning and Full Facilities Removal.** This alternative should evaluate the effects of decommissioning the facility and removing all of the Project Works.
2. **CEQA "No Project" alternative.** The "No Project Alternative" under the California Environmental Quality Act ("CEQA") is denial of the project application. Therefore it differs from the NEPA No Action Alternative, which requires evaluation of continuing the status quo, along with evaluating likely future actions. The CEQA No Project Alternative requires evaluation of the environmental effect of the state agency denying the requested discretionary action. As discussed below, given that the State Water Resources Control Board ("State Board") will need to comply with CEQA if it determines to issue the necessary 401 certification for the Project, it would better serve to inform the public and decision-makers if this information was included within the EIS and compared with the other NEPA alternatives.
3. **Non-Power License.** This alternative would evaluate the effects of a government agency securing a temporary license in order to retain certain project facilities (i.e., diversion works) but removing power generation and other facilities. We recommend that the alternative include the minimum facilities necessary for water diversion, including potential alternative means of diversion.
4. **Partial Facilities Removal.** This set of alternatives should evaluate a range of partial facilities removal, including removal of Scott Dam and partial removal or lowering of Scott Dam to facilitate fish passage and water quality, as well as facilities modifications at Cape Horn to improve fish passage and water quality.

Given the environmental setting discussed above, all of the above alternatives are reasonable and should be given further consideration. Yet, in SD1, FERC cursorily eliminates both the Non-Power License and Project Decommissioning as alternatives for review. For

example, in dismissing a project decommissioning alternative, SD1 states:

> ***The project provides a viable, safe, and clean renewable source of power and consumptive water to the region.*** *With decommissioning, the project would no longer be authorized to generate power.*
>
> *No party has suggested project decommissioning would be appropriate in this case, and* ***we have no basis for recommending it****. Thus, we do not consider project decommissioning a reasonable alternative to relicensing the project with appropriate environmental measures.*

SD 1 at p. 16 (emphasis added).

First, SD1 is factually incorrect in suggesting "no party has suggested project decommissioning would be appropriate in this case." The opposite is true, as demonstrated by comments at the scoping meeting. For decades, federally recognized Indian Tribes and many other stakeholders have argued for project decommissioning and a free flowing river. Even FERC's fellow federal government agencies have insisted that decommissioning be evaluated. *See* PAD vol 2 at 188. For example, NMFS' 2002 Biological Opinion Conservation Recommendation #4 stated:

> FERC should study the feasibility and develop a schedule for decommissioning and removing the Potter Valley Project in order to restore unimpaired flows and restore access to historical salmonid spawning and rearing habitats to aid in the recovery of listed salmonids in the Eel Basin.

Further, numerous concerned members of the public have already commented at the Scoping Meetings and in writing on SD1 and have requested consideration of a decommissioning alternative. FERC should heed these requests.

Equally critical, FERC is wrong to suggest there is "no basis for recommending [decommissioning]." In fact, FERC has, in consultation with other federal agencies charged with implementing NEPA, adopted guidelines that specifically address when a detailed analysis of decommissioning is warranted. *See* FERC, *Preparing Environmental Documents* (2008), https://www.ferc.gov/industries/hydropower/gen-info/guidelines/eaguide.pdf ("FERC

Guidelines") at p. 35. The FERC Guidelines set forth a minimum of 17 factors for the agency to consider in determining whether to analyze a decommissioning alternative. SD1 gives absolutely no indication that FERC has considered these factors. If the agency were to properly consider these factors, it would be clear that the EIS should fully evaluate a decommissioning alternative.

To determine when to include project decommission in its analysis, FERC should consider the beneficial or adverse effects of the project on a variety of resources, including but not limited to:

> (1) listed threatened or endangered species; (2) economic viability of the project, including costs of resource protection measures; (3) whether the river is targeted for fish recovery; (4) feasibility of fish passage; (5) consistency with comprehensive plan(s); (6) protected river status (e.g., scenic river, wilderness area); (7) effectiveness of past mitigation measures and availability of future measures; (8) support by applicant or other party for project retirement; (9) Tribal lands, resources, or interests; (10) water quality issues, including presence of toxic sediments; (11) potential opportunities for recreation; (12) physical condition of project; (13) presence of existing project-dependent development (e.g., houses abutting reservoir); (14) other non-power project-related benefits (e.g., municipal water supply, flood control, irrigation); (15) project-dependent resource values (e.g., recreation, wetlands, wildlife, habitat); (16) need for power and ancillary services; and (17) historic properties.

FERC Guidelines, *supra*, at p. 35.

These factors also appear relevant as to whether FERC should consider the additional alternatives mentioned above, including denial of the project license (the CEQA "No Project" Alternative), a non-power license, and partial facilities removal. As set forth below, nearly every one of these factors weighs heavily in favor of including a decommissioning alternative as well as the other alternatives mentioned above:

(1) Listed threatened or endangered species

As discussed above, the Eel is home to three listed runs of salmonid.[21] Coho salmon are listed as Threatened under both the California and federal Endangered Species Acts. Eel River chinook are listed as threatened under the federal ESA. Eel River steelhead are listed as a single ESU, with Threatened status, under the federal ESA. In reality, summer steelhead are genetically distinct in critically important ways from winter steelhead, and the surviving populations of summer steelhead in the Eel River must be judged critically endangered. *See supra* Part II.A.

The detrimental and continuing impacts of the Project and its operations on chinook salmon and steelhead have been the focus of continuing efforts for decades. FERC should be well informed of the presence of threatened and endangered fisheries in the upper mainstem Eel River, and of the impacts of Project operations on those species. *See supra* Part II.A.

There is reason to believe that dam removal would substantially benefit chinook and steelhead. Summer steelhead would benefit particularly from renewed access to the upper-basin spawning habitats in which they specialize. *See supra* Part II.A. While dam removal may cause transient impacts to salmon and steelhead, those impacts may be largely mitigated, and could in any case be completely outweighed by the benefits to the fisheries of dam removal. Although the state of the record is not currently sufficient to resolve these issues, it is precisely the role of the NEPA document to provide analyses of these and similar questions.

(2) Economic viability of a project, including costs of resource protection measures

Stakeholders do not know whether the Project even covers its maintenance and liability costs given its irregular and limited power production. Given that energy production fell much more steeply than water transfers during the current license period, additional reductions in water transfers which may be required to protect fisheries are likely to result in even more dramatic reductions in power production.

---

[21] In addition, the project area hosts at least one listed amphibian – the foothill yellow legged frog – and the Threatened Northern Spotted Owl.

Further, operations of the Lake Pillsbury reservoir are increasingly constrained by a series of factors: increasing sediment; the need to maintain a minimum pool higher than previously anticipated; the need to maintain flood control capacity; and the need to address the 'ecological trap' the cold water flows create in the 12 mile reach between Scott Dam and Cape Horn Dam. As we have seen in the recent drought, these constraints cannot currently be met in very dry years.

Of course, Scott Dam makes no provision for fish passage. Providing fish passage may be technically feasible, but at 140 feet, Scott Dam presents a formidable challenge. Even if technically feasible, a fish ladder over Scott Dam may be prohibitively expensive and/or environmentally unsatisfactory.

In addition to fish passage, there are likely to be other additional costs associated with relicensing that may make continued operation even less economically attractive than it currently is. Decommissioning the project could therefore prove to be the most reasonable outcome.

(3) River targeted for fish recovery

The Eel River has been targeted for fish recovery at least since 1941, when Leo Shapavolov advocated protecting the river as a steelhead sanctuary. In more recent decades, the California Department of Fish and Wildlife issued its 2004 Coho Recovery Strategy.[22] NMFS has issued Recovery Plans for coho (2014) and for steelhead and chinook (2016). All emphasize the importance of the Eel River to fisheries recovery. The NMFS Multispecies Recovery Plan (NMFS 2016) lists both the Upper Eel River CC Chinook Salmon and NC Steelhead as Essential Functionally Independent populations, within the North Mountain Interior diversity strata. These populations form the foundation of species viability, and play a key role in species

---

[22] California Department of Fish and Wildlife. *Recovery strategy for California Coho salmon: report to the California Fish and Game Commission, Species Recovery Strategy 2004-1.* California Department of Fish and Game, Native Anadromous Fish and Watershed Branch. Sacramento, CA (2004)

recovery as they must attain a low extinction risk for the populations to meet recovery criteria (be delisted).[23] The NMFS Coho Recovery Plan (NMFS 2014) designates the entire Eel River as a single diversity stratum; this stratum must also be at low risk of extinction to meet coho salmon recovery criteria (be delisted).[24] Removing the Eel River dams is arguably one of the most significant steps we can take toward creating the conditions for salmonid recovery and survival in the Eel River.

(4) Feasibility of fish passage

Scott Dam is a barrier to upstream fish passage. At 140 feet, Scott Dam is apparently close to the technical limits of a feasible fish ladder. The costs and potentially limited results have thus far prevented a fish ladder from being built.

While efforts continue to improve fish passage at Van Arsdale, particularly for lamprey, substantial barriers to fish migrations, which have existed for more than a century, remain largely unexamined and unacknowledged. And significant problems continue to arise. For example, the fish screens were apparently covered with debris – and the fish ladder thus offline – for 51 days this past winter of 2017, starting in February. It is not clear what impacts this - obstruction may have had on downstream passage of steelhead, chinook, and other fish. Further, in recent years, FERC granted PG&E a variance to curtail prescribed flow releases because the Lake Pillsbury reservoir was getting dangerously low. This essentially resulted in the ceasing of the upriver migration of chinook at precisely the point that releases down the Eel were curtailed.

Finally, even if all the mechanisms of fish passage are functioning as intended, the way that the dams and diversion tunnel are constructed means that flow releases from the Lake Pillsbury reservoir, which are meant mostly for diversion to Potter Valley, render the 12 mile

---

[23] NMFS (National Marine Fisheries Service). 2016. Coastal Multispecies Recovery Plan. National Marine Fisheries Service, West Coast Region, Santa Rosa, California.

[24] NMFS (National Marine Fisheries Service). 2014. Final recovery plan for the southern Oregon/northern California coast evolutionarily significant unit of Coho salmon (*Oncorhynchus kisutch*). National Marine Fisheries Service. Arcata, CA. 1841 pp.

reach between the dams to some extent an ecological trap. The cold releases from Scott Dam retard the outmigration of young chinook and steelhead, dramatically reducing the utility of the inter-dam reach as a spawning and rearing ground.

Perhaps the most obvious benefit of dam removal would be restoring fish passage to the upper Eel River.

(5) Consistency with comprehensive plan(s)

Numerous comprehensive plans exist for the protection and recovery of fish species in the Eel River. Consistency with such plans may require or benefit from project decommissioning or other similar alternative. Such plans include, but are not limited to:

- NMFS' Recovery Plans for Coho, Chinook/ Steelhead
- CA Department of Fish and Wildlife Coho Recovery Strategy
- US Forest Service National Forest Land and Resource Management Plan ("LRMP") for Mendocino National Forest
- BLM Regional Plan
- Round Valley Indian Tribe Tribal Restoration Plan
- State Water Resources Control Board's Basin Plan

The EIS should evaluate the Conservation Groups' suggested alternatives and compare each alternative's consistency with these plans with that of the proposed Project.

(6) Protected river status (e.g., scenic river, wilderness area)

As noted, the Eel and its principal tributaries except the upper mainstem from Cape Horn Dam up is designated as both a California and a federal Wild & Scenic River. If the dams were removed, the resource values that motivated W&SRA designation would again exist in the reaches now affected by the dams.

There is also designated Wilderness in the Project area in the Mendocino National Forest and in the upper Eel River watershed above the Project. Further, the Lake Berryessa National Monument includes lands within the Eel River watershed above the Project. These protected lands would help protect and secure landscape and fisheries restoration following dam removal;

they would also benefit from dam removal, principally by the restoration of natural processes and native fisheries to the landscape.

(7) Effectiveness of past mitigation measures and availability of future measures

Past mitigation measures have not been as successful as anticipated, and future measures are looking more and more difficult to secure.

The requirements imposed by the RPA in 2003 to reduce take of listed salmon and steelhead have proved difficult and or impossible to implement. PG&E has had to repeatedly seek flow variances. Pikeminnow reduction strategies have been abandoned, without success, and pikeminnow continue to spread throughout the watershed.[25] Pikeminnow predation clearly reduces reproductive success in the interdam reach, adding to the evidence that it is often an ecological trap. It is not clear what mitigation might effectively address the pikeminnow invasion at this point. Nor have the RPA measures proved successful in providing for salmon and steelhead recovery.

Climate change and diminishing reservoir capacity makes past strategies for fish flows less certain, even unlikely of attainment in dry years – as the recent drought has shown. It is increasingly likely that cold water pools will not be available in late summer, or early fall. This would be particularly threatening to summer steelhead, already critically imperiled.

Dam decommissioning would be the most effective overall form of mitigation possible for the impacts of the Project.

(8) Support by applicant or other party for decommissioning

FERC states that it need not prepare a decommissioning alternative because "(n)o party has suggested project decommissioning would be appropriate in this case." However, the Round Valley Indian Tribes, the Conservation Groups, and both the NMFS and EPA have called for FERC to consider dam decommissioning since the early 2000s. *See* PAD Vol 2 at 188. And thus far, PG&E has not stated that it is opposed to studying dam decommissioning. Review of such

---

[25] Josh Fuller, NMFS, pers comm June 2017.

an alternative would certainly not be prejudicial to the licensee. In fact, in recent months, PG&E has declared its intent to transfer or surrender a FERC license for projects that on their face seem more valuable to their customers than the PVP (*see, e.g.*, the DeSabla – Centerville proceedings on Butte Creek).[26] Evaluation of a decommissioning alternative could assist PG&E as well as FERC in making such a determination with respect to this Project.

(9) Tribal lands, resources, or interests

There are certainly tribal lands, resources, and interests which would be affected by dam decommissioning. We expect that the Tribes, who speak directly for those interests, will submit comments that articulate the potential impacts of dam decommissioning on their particular and specific interests, and the Conservation Groups defer to such comments. Nevertheless, we note that recovery of ecologically functional populations of Eel River fisheries is consistent with the survival of tribal peoples whose culture is interwoven with those species.

(10) Water quality issues, including presence of toxic sediments

The Eel River watershed, including the upper mainstem, is designated under §303(d) of the Clean Water Act as impaired for temperature and sediment; the Lake Pillsbury reservoir is listed for mercury as well.

Scott Dam produces cold water, which would seem to help with the need for colder flows, but this is not always the result, particularly late in drought years, when cold water is most needed.

The word 'mercury' does not appear in SD1. However, the PAD notes at page 5 – 101 that:

> *Sampling of fish tissue taken from Lake Pillsbury fish has detected high concentrations of mercury, averaging 1.31 parts per million (ppm) in 350 millimeter (mm) largemouth bass (Micropterus salmoides), and* ***the highest concentration for an individual fish*** *(4.08 ppm*

[26] PG&E, Notice of Withdrawal of Application of New License, DeSabla – Centerville Project, FERC No. 803-087, February 16, 2017, FERC eLibrary no. 20170216-5038.

in a 559 mm largemouth bass) ***in statewide sampling*** *(Davis et al. 2009). Consequently, Lake Pillsbury is designated as impaired for mercury on the California 303(d) list.*

The levels, source, and implications of mercury and methylmercury in the upper Eel, particularly in the Lake Pillsbury reservoir, require further detailed review in the EIS. In particular the EIS should evaluate whether Project operations generate or contribute to the mercury pollution found in fish in the Lake Pillsbury reservoir. It should also evaluate the short and long-term impacts of the removal or failure of the Project dams on toxic sediments.

(11) Potential opportunities for recreation

The primary limits on recreational use of the Eel River are access and the limited season when flows suitable for many recreational uses coincide with warm air temperatures. Dam removal could be expected to create more opportunities for recreational water use below the area that is now the Lake Pillsbury reservoir because boating flows would be less attenuated in the absence of the dam. However, dam removal would also lead to the loss of recreational opportunities now associated with the existence of the reservoir. The EIS should evaluate the recreational impacts of dam decommissioning and partial or full dam removal.

(12) Physical condition of project

As discussed in detail above, the available evidence strongly suggests that Scott Dam was not constructed in a manner that would be accepted today, and that both dams continue to suffer from structural issues which can be expected to continue. Again, it is difficult for the Conservation Groups or other members of the public to comment on this aspect due to the classification of materials as CEII. We again request that FERC re-designate such materials out of CEII. However, it is clear that removal of these centuries-old structures would ultimate alleviate concerns regarding their structural integrity and prevent safety hazards akin to those that occurred at Oroville Dam.

(13) Presence of existing project-dependent development (e.g., houses abutting reservoir)

The Lake Pillsbury reservoir has some project-dependent development, including the Lake Pillsbury Resort campground and marina, various other campgrounds, and the Rice Fork

development, which are primarily summer homes. The EIS would need to evaluate the impacts on dam removal to this development in comparison to the benefits that could be gained, such as the benefits of having development in proximity to a living river, with healthy fish runs.

(14) Other non-power project-related benefits (e.g., municipal water supply, flood control, irrigation)

It is overwhelmingly clear that the principal driver of the Project is not the small and irregular amount of electrical power it produces, but the water diverted to the Russian River through the Project powerhouse. Plainly, the Potter Valley Irrigation District (PVID) depends on these diverted flows.

However, it is far from clear how much of the water diverted to the Russian from the Eel serves which specific actual needs, and how those diverted flows are associated with which established water rights. Neither SCWA nor PVID have provided evidence or facts on the record to support the contention that some 600,000 people depend on Eel River water. SCWA's domestic water supplies are drawn primarily from the Russian River at their Raney Collectors, which are downstream of Dry Creek, where releases from Lake Sonoma's storage enter the mainstem Russian River. Water stored at Lake Sonoma provides two years' worth of water to meet SCWA and downstream Russian River demands. Further, SCWA's modeling for its Fish Flows DEIR does not address "unaccounted for losses and diversions," which means that the demands and diversions from the upper and middle reaches of the Russian River are potentially substantially overstated. *See* Exhibit 1 (Kamman Report).

FERC must seek real clarity from PG&E and Russian River stakeholders. To fairly and independently evaluate the benefits of the project for irrigation, municipal water supply, and so forth, the EIS should include a review of what entities have established rights to what water, and to what uses the water that is being diverted is being put. FERC must provide a full accounting of water rights relevant to the Project. As discussed above, the information thus far included in SD1 with respect to water rights appears inaccurate and incomplete.

(15) Project-dependent resource values (e.g., recreation, wetlands, wildlife, habitat)

These comments by the Conservation Groups, as well as others submitted by the resource

agencies and various individuals and groups, present a strong case that decommissioning and dam removal would benefit recreational, wetlands, wildlife, and habitat values. The EIS should evaluate such alternatives in order to provide the applicant, the public, and the Commission with the comparative information necessary to determine the environmental impacts and costs and benefits associate with each alternative and the proposed Project.

(16) Need for power and ancillary services

The Project's relatively low generation capacity, operational constraints, and rapid changes in our electrical power supply system suggest that the kind of power the Project supplies – nonpeaking baseload – is neither in particularly short supply, nor especially valuable to the operator or to society at large. The irregularity of Project power production would appear to further diminish its utility.

FERC must ask not only what the actual cost of PVP power is, but also what it is worth. Given that PG&E could fairly cheaply replace the power production of the Project with five acres of solar panels on Ukiah rooftops, with a net gain in power production, it is far from clear that there is any meaningful need for the power and ancillary services the Project now supplies. A complete analysis of PVP operations, costs, generation, sales and distribution must be conducted to properly understand the functioning and licensing of PVP as a hydropower project. The EIS must disclose data in enough fine-grained detail to understand whether alternative sources of electricity, particularly peak-hour production, and responding to climate change, can be achieved to supply the regional grid and customers more efficiently and cheaply than by the PVP.[27]

(17) Historic properties

Neither Cape Horn nor Scott Dam are classified as historic properties. PAD, 5 – 283. Thus, dam removal would not impair historic properties.

---

[27] *See* Rosenblum Environmental Engineering letter, with attachments, dated July 26, 2017, included within Appendix A as Study Request 2.

Summary

In sum, even a superficial consideration of the 17 factors FERC committed to considering shows that the EIS must examine decommissioning and other similar reasonable alternatives. At a bare minimum, FERC must adequately evaluate the above 17 factors before determining not to include such alternatives.

VI. FERC Should Coordinate a Joint NEPA/CEQA Analysis with the State Board.

Under section 401(a)(1) of the Clean Water Act ("CWA") the Commission may not issue a license for a hydroelectric project unless the State Board has issued a water quality certification for the Project. In issuing such a certification, the State Board must comply with CEQA. *See* Pub. Res. Code § 21065(c); Cal. Code Regs., tit. 22, § 3856(f). The Conservation Groups strongly encourage the Commission to coordinate its responsibilities under NEPA with those of the State Board under CEQA regarding its processing of the required 401 certification for the Project by combining those analyses into a joint NEPA/CEQA document.

Federal regulations require agencies to cooperate "to reduce duplication between NEPA and State and local requirements," and further provide that "such cooperation shall to the fullest extent possible include . . . joint environmental assessments." 40 C.F.R. § 1506.2. "A joint [NEPA and CEQA] review process can avoid redundancy, improve efficiency and interagency cooperation, and be easier for applicants and citizens to navigate." Council on Envtl. Quality & Cal. Off. of Planning & Research, NEPA and CEQA: Integrating Federal and State Environmental Reviews 1 (2014). For example, as noted above, CEQA requires a different "no project" alternative than the NEPA "no action alternative." It would be far more efficient and conducive to public input for a joint NEPA/CEQA document to include all the relevant alternatives now and compare and contrast them, rather than for the agencies and the public to have to juggle this information in two sets of reviews.

If FERC and the State Board are unable for any reason to prepare a joint environmental review, at an absolute minimum FERC should endeavor to include information in the EIS that can be later used in the CEQA analysis, such as the required CEQA "no project" alternative. By including all the relevant environmental analysis of the Project in the initial review document,

FERC will demonstrate its commitment to an open and cooperative public process, as well as reduce the demands of these environmental review processes on FERC's and the State Board's own resources.

COMMENTS ON THE PAD

Pursuant to 18 C.F.R. § 5.6(b)(1), PG&E must prepare a PAD, which provides the Commission, the Conservation Groups, and other interested parties with:

> Existing information relevant to the project proposal that is in the potential applicant's possession or that the potential applicant can obtain with the exercise of due diligence. This existing, relevant, and reasonably available information is distributed to these entities to enable them to identify issues and related information needs, develop study requests and study plans, and prepare documents analyzing any license application that may be filed. It is also a precursor to the environmental analysis section of the Preliminary Licensing Proposal or draft license application provided for in § 5.16, Exhibit E of the final license application, and the Commission's scoping document(s) and environmental impact statement or environmental assessment under the National Environmental Policy Act (NEPA).

Based on our review of the PAD, additional information is needed to refine the proper scope of the EIS and to complete study requests. We begin with general comments, followed by specific comments on identified sections of the PAD. For ease of reference, we organize our specific comments according to the headings provided in the PAD.

I. General Comments

The last relicensing for the Eel River dams and diversion (the "Potter Valley Project," PVP, or the Project) took place against a backdrop of rising concern about the decline of salmon and steelhead in the Eel River and across the West Coast. FERC issued the last license in 1983, but did not finalize a proposed minimum flow regime protective of Eel River fisheries until 2000. However, chinook and coho salmon and steelhead were listed under the federal ESA in 1999, and 2000, respectively.[28]

---

[28] *See* note 3, *supra*.

On review of the PVP license, NMFS determined in 2002 that continued operation of the PVP under those revised rules would jeopardize the existence of listed species. The RPA rules under which the Project has operated since 2003 were put in place to protect listed salmonids.

However, it is our opinion that the RPA measures have not been sufficient to provide for fisheries recovery in the Project area. Specifically, the RPA measures have not been maintained during drought years, and there has been a steady decline in salmonid abundance in the Eel River. Thus, greater provisions for fisheries will probably need to be made in future than have been made to date. Meanwhile, the system is steadily losing, not gaining, flexibility to meet such needs in future years.

Additionally, there are a number of concerns about the safety and reliability of the Eel River dams, particularly with respect to seismic and geotechnical stability generally, and with conditions around the left abutment of Scott Dam.[29] Those questions raise additional substantial issues with respect to the potential costs, risks, and benefits associated with the Eel River dams and Potter Valley diversion.

The following are our specific comments on the PAD. For ease of reference, we organize our specific comments according to the headings provided in the PAD.

II. Specific Comments on PAD Sections

3.3.1 Eel River Watershed

State and National Wild and Scenic status of the Eel River.

The PAD fails to identify the Eel River as a State designated Wild and Scenic River which affords protection under the California Wild and Scenic Rivers Act:

> It is the policy of the State of California that certain rivers which possess extraordinary scenic, recreational, fishery, or wildlife values shall be preserved in their free-flowing state, together with their immediate environments, for the

---

[29] See Melosh, G., *Geologic Risks at the Potter Valley Project* (July 20, 2017), available at https://drive.google.com/file/d/0B8LzWutg0vukcWpsbEJycFlLbTg/view?usp=sharing

benefit and enjoyment of the people of the state. The Legislature declares that such use of these rivers is the highest and most beneficial use and is a reasonable and beneficial use of water within the meaning of Section 2 of Article X of the California Constitution.[30]

The State designated sections of the Eel River include the main stem from 100 yards below Van Arsdale Dam to the Pacific Ocean; the South Fork of the Eel River from the mouth of Section Four Creek near Branscomb to the river mouth below Weott; Middle Fork of the Eel River from the intersection of the river with the southern boundary of the Middle Eel River - Yolla Bolly Wilderness Area to the river mouth at Dos Rios; North Fork of the Eel River from the Old Gilman Ranch downstream to the river mouth near Ramsey; Van Duzen River from Dinsmores Bridge downstream to the river mouth near Fortuna.[31]

The National Wild and Scenic Rivers Act, Section 7(a) outlines that the managing agency must determine whether the project either invades or unreasonably diminishes the scenic, recreational, fish or wildlife values present at the date of designation. Additionally, in an integrated licensing process a preliminary Section 7 determination will need to be submitted by the river-administering agency.[32] Thus, the PAD needs to include a more detailed description of the National Wild and Scenic components within the watershed identifying classifications, the Outstanding Remarkable Values (ORV) for each section of river, and administering agencies.

While the PAD breaks down the percentage of each Wild and Scenic classification type within the watershed, the description does not pinpoint the location of either wild, scenic or recreational sections on the potentially affected Eel River from Cape Horn Dam to the confluence of the Middle Fork Eel River. These Wild & Scenic classification locations are as

---

[30] California Public Resources Code Division 5 Parks and Monuments Chapter 1.4 California Wild and Scenic Rivers Act [5093.50 – 5093.70]

[31] *Ibid.*

[32] Interagency Wild and Scenic Rivers Coordinating Council. Wild & Scenic Rivers Act: Section 7 (Internet). Portland, Oregon (USA). U.S. Forest Service; October 2004 [cited 2017 April 12]. 38 p. Available from: https://www.rivers.gov/documents/section-7.pdf

follows:[33]

- 100 Yards below Van Arsdale Dam to Confluence with Tomki Creek – Recreational
- Confluence with Tomki Creek to Middle of Section 22 T19N R12W – Scenic
- Middle of Section 22 T19N R12W to Boundary between Sections 7 and 8 T19N R12W - Recreational
- Boundary between Sections 7 and 8 T19N R12W to Outlet Creek – Wild
- Outlet Creek to Confluence with the Middle Fork Eel River - Recreational

In this same vein, the PAD details that fish are the Outstanding Remarkable Value (ORV) for each of these river sections. Finally, the administering agencies are identified as the State of California, USFS, Bureau of Land Management, Round Valley Indian Reservation and the National Park Service. [34] [35]

4.4 Project History and Overview

The original purposes of the PVP were hydroelectric generation and water diversion. The "Eel Power and Irrigation Company" built the Cape Horn dam, which was absorbed into the "Snow Mountain Water and Power Company."

As the original names of the owners and operators of the PVP suggests, one of the principal purposes of the PVP is to divert water for irrigation interests. To properly consider relicensing for the next 30-50 years or alternatives for the PVP, FERC must fully analyze the water diversion data available through this process.

- The PAD states at page 4-2: "Cape Horn Dam has fish passage facilities, enabling salmon, steelhead, and lamprey to access the Eel River and tributary streams between

---

[33] https://www.rivers.gov/rivers/eel.php

[34] River Mileage Classifications for Components of the National Wild and Scenic Rivers System (Internet). December 2016 [cited 2017 July 18]. Page 8. Available from: https://www.rivers.gov/documents/rivers-table.pdf.

[35] Memorandum of Understanding Between the National Park Service Pacific West Region, Bureau of Land Management, California State Office and the U.S. Forest Service Pacific Southwest Region.

Cape Horn and Scott Dams."

- While this statement is true, it should be qualified. Cape Horn's fish ladder allows salmon and steelhead to pass upstream and downstream, but does limit some migration. The respective levels of success in fish passage are of great concern to the Conservation Groups.

- The PAD also states: "Releases made at Scott and Cape Horn Dams support salmon and steelhead populations in the Upper Eel River Watershed."
  - Salmonid populations have been declining in the Eel River since records were kept since the construction of the PVP. While there is evidence those populations benefit from cold-water releases from Scott Dam, there is also evidence that pikeminnow predation and retarded outmigration significantly diminish, and may outweigh, any benefits to fisheries of Project operations.
- The PAD states: "The Potter Valley Powerhouse is located in the Upper Russian River Watershed, and releases from the powerhouse are a significant source of water in the East Branch Russian River and for local water users."
  - We request additional information as to whether PVP powerhouse operations and diversions are necessary for PG&E to generate power as compared with alternative sources of power such as solar, wind, co-gen, and service area efficiencies and conservation. Additionally, we request that FERC analyze what proportion of available water in the East Branch Russian River PVP diversions constitute during the year, what alternative sources of water may be available, and at what cost.
- The PAD states: "The East Branch Russian River flows south from the Potter Valley Powerhouse (approximately 11 miles) and is impounded by the U.S. Army Corps of Engineers' (USACE) Coyote Dam to form Lake Mendocino. ... Water from Lake Mendocino is used in Mendocino and Sonoma Counties for irrigation, municipal and domestic water supply, recreation, and support of salmon and steelhead populations in the Russian River."

- We request documentation of the data PG&E used to find that the Eel River diversions are needed for "Mendocino and Sonoma Counties for irrigation, municipal and domestic water supply, recreation, and support of salmon and steelhead populations in the Russian River," as the PAD intimates.
- One of the key questions the EIS must analyze is the extent to which Eel River diversions have been, are, or are needed in the "Water from Lake Mendocino ... used in Mendocino and Sonoma."
- This should include current and potential future compliance with SWRCB Frost Water Irrigation requirements, and actual accounting for water rights, permits and licenses, losses to connected groundwater, as well as accounting for currently unknown, illegal, unpermitted and other losses to the Russian River watershed. Demands for Russian River water diversions (including PVID) must also account for current irrigation methods and other water use that is not meeting BMPs for efficiency, conservation and reuse. The Russian River is currently designated as 'over-appropriated' by SWRCB; those demands must be reduced.
  - Downstream users have asserted that 600,000 people are dependent on Eel River diversions. There is no data or evidence in the public record to substantiate the validity or extent of this claim. The description of existing conditions for the EIS and the relicensing process must address the ability of the Sonoma County Water Agency to fulfill municipal water demands through its storage and releases of water in Lake Sonoma, wells and groundwater supplies, combined with local municipal supplies. Further, managers' ability to meet minimum instream flows in the Russian River below its confluence with Dry Creek must be addressed.
- Note that the final license amendment for the Project requires readjustment to accommodate D.1610 changes. (Article 58 – see Table 4-5, page 4-42).

4.5.1.1 Scott Dam

- The PAD states: "Scott Dam is a concrete, gravity-type, ogee-shaped structure having

a maximum height of 130 feet and a total length of 805 feet. The ogee crest, which is at an elevation of 1,818.3 feet, is surmounted by five radial gates, each 32 feet wide by 10 feet high, and 26 steel slide gates, each 10 feet high and varying in width from 7.5 feet to 10.08 feet. The gates are manually operated with the exception of Gate 13 which is automated."

- We request a determination of the potential effects of the failure of the Gate 13's automated operation as well as the differences in operational effectiveness between automated and manual gate use. The Conservation Groups are concerned that failure of Gate 13, or its control mechanisms, could lead to Scott Dam being overtopped.
    - Additionally, we request information regarding the emergency response to gate failure specifically on backup and remotely controlled power supply, the ability to free gates or the needle valve and the grizzly intake structure if jammed with debris, sediments, or other malfunctions, and duplicative remote sensing.

4.5.1.2 Cape Horn Dam

- The PAD states: "There is a 5-foot-diameter outlet through the spillway structure which was abandoned in place in 1987 due to an accumulation of sediment preventing its operation, and the construction of a weir associated with fish ladder improvements that flooded the downstream side of the outlet."
    - We request additional information on the effectiveness of outlet as a downstream fish passage.

4.5.2.1 Lake Pillsbury Reservoir

Current storage capacity is described as 76,876 af, but "normal usable storage" is 66,876 af. We request additional information on the implications of reducing "normal usable storage" to 66,876 af, with an explanation as to why this storage potential is not used to fulfill the RPA requirements. At the conclusion of the 2016 Potter Valley Drought Working group, PG&E staff committed to providing new modeling, surveys and proposals to determine absolute minimum

storage levels in Lake Pillsbury commensurate with any safety or operational concerns, particularly in context of providing late season releases for fish during extended drought. We request this review be completed and released for timely review.

The licensee or FERC should also describe sediment accumulation (or decreases, as currently surveyed) and evaluate the potential for collapse of the sediment banks behind the dam, which could increase risks to stability.

The EIS should state what the storage capacity of the reservoir was when constructed, and provide specific data as available documenting the reduction in storage capacity over time, , both in the past and over the next 30, 50 and 100 years.

The EIS should explain the history of the construction of Scott Dam in detail, including the utility of the Project as it was understood at the time.

- The PAD states: "Verification of the minimum storage level necessary to protect project infrastructure and downstream resources is part of on-going analysis."
    - We request that the licensee or FERC explain what analyses are being considered in this ongoing verification process and how the minimum necessary storage level is likely to change over 30, 50, and 100 years. Additionally, we request that licensee or FERC evaluate and describe in a detailed and specific manner the potential consequences of damage to the needle valve, especially during the dry season or periods of low flows, be released and analyzed in the EIS.

4.5.2.2 Van Arsdale Reservoir

- The PAD states: "The gross storage capacity of Van Arsdale Reservoir was originally 1,457 ac-ft with a usable capacity of 1,140 ac-ft. Accumulation of sediment over time has resulted in significant loss of reservoir capacity. Based on the most recent bathymetric and topographic surveys conducted in 2002 and 2006, the current reservoir capacity is less than 390 ac-ft (PG&E 2015; PG&E 2006)."
    - We request that the EIS analyze the historical record, which reports that the Van Arsdale reservoir filled with sediment during a relatively short period of time, which helped drive the construction of Scott Dam.

4.5.3.1 Van Arsdale Intake

- The PAD, in describing the fish screens, states on page 4-32: "The results of the tests indicated that the screens met the majority of the acceptance criteria (SEC 1996). Issues that were identified as needing attention to fully meet the acceptance criteria were later addressed."
    - We request that the licensee or FERC describe which of the acceptance criteria were not satisfied by the fish screens and what measures were taken in order to address this problem. Additionally, we request that the licensee or FERC describe the effectiveness of the present fish screens in the PVP and the degree to which the rest of the bypass structures meet NMFS and CDFW's current standards and BMPs for fish screens, intakes and ladders for salmonids and lamprey.
- The PAD also states: *"*The fish screens and fish return system remain in continuous operation from October through July, except during periods of storm runoff when flows are 7,000 cfs or greater, at which time diversion is ceased to avoid damage to the screens."
    - We request that the licensee or FERC describe and analyze the implications of this limited season of operation for water diversions, power production, and fish migration. Additionally, we request analysis of the frequency of flows in excess of the 7,000 cfs threshold and the likely implications to cohort survival. More specifically we request analysis of the likely consequences of the reported 51-day period in the winter of 2017 in which the screens and the fish ladder were offline. Multi-year daily data should be provided to understand the frequency of such operational interruptions.

4.5.5.1 Potter Valley Powerhouse

We request additional information on why power generation was reduced disproportionately to the amount of water diverted to the Russian River and if the pre-RPA flow

regime was constructed to maximize power production, irrigation volumes, or both.

Additionally, we request additional information and analysis on why power production and diverted flows through PVP are not direct correlations. This information is necessary to understand what power production might reasonably be expected from the existing infrastructure under various flow scenarios.

4.5.7 Gages, Weirs, and Piezometers

- The PAD states: "PG&E maintains leakage weirs and piezometers at Cape Horn Dam and Scott Dam."
    - We request additional information on why FERC has required their placement, and we request that the licensee describe the monitoring and disclose the data it has retrieved. *See* Exhibit 2 (Miller Pacific Report).

4.6 Existing Project Operations

- The PAD states: "The Project is operated in compliance with existing regulatory requirements, agreements, and water rights to generate power and deliver consumptive water to local water users."
    - We request documentation of the suggestion that continued operation of the PVP under the terms of the current license is fully consistent with all relevant provisions of law, including but not limited to the Endangered Species Act, Clean Water Act, California Fish and Game Code 5937, and the public trust resources in the Eel and Russian Rivers.

4.6.1 Water Management

The RPA flows represent a clear improvement over the historic flow regime. However, there is no substitute for maintaining natural conditions in the river.

NMFS' 2002 Biological Opinion found that the 2000 amendment to the 1983 license (PVID alternative chosen by FERC) would have jeopardized the survival and recovery of listed salmon and steelhead in the Eel River. (PAD at p. 4-44). That jeopardy finding meant that FERC had no choice but to adopt the RPA flow regime in the 2004 license amendments.

However, we do not believe that the RPA flow regime has adequately provided for the

recovery of Eel River fish under current conditions. The PAD states that the RPA "remains the currently required flow regime." However, PG&E has not fully implemented the RPA. We request that FERC evaluate other alternatives to the RPA.

The PAD states that "NMFS continues to closely evaluate flows in the Eel and Russian Rivers, seeking to balance the benefits to salmon and steelhead in both rivers while considering other beneficial uses." We do not believe that the fisheries resources in the Eel and the Russian Rivers are equitably balanced in the current operation of the Project. The EIS should identify "other beneficial uses" by type, extent, location and success, and the extent to which Eel River diversions are a component of such uses over the course of a water year.

The Eel River offers wild, and federally and state listed, salmonids, and the Russian River, although important, primarily contains hatchery salmonids. The EIS should accurately reflect the conservation status and relative significance of Eel River and Russian River fisheries, and of the impacts of the Project and its operations on those fisheries.

To the extent any listed fish in the Russian River basin actually benefit from Eel River diversions, it is chinook in the Russian below Coyote Dam. The licensee and FERC should evaluate management options available to provide Russian River chinook the flows they need without any Eel River diversions.

The licensee, FERC and Russian River water purveyors should evaluate the degree to which diversions within the Russian River are appreciably reducible through efficiency;, conservation; reuse; increases in local storage for frost, growing season and heat irrigation; better management of connected groundwater; cultivation of crops more appropriate to water availability, and enforcement against illegal, unpermitted, unlicensed and other non-beneficial uses. Water purveyors in the Russian River watershed should review growth projections for Russian River municipal and agricultural water demands and adjust them based on actual water sustainably available from within the Russian River watershed, in order to avoid "paper water" justifications for development approvals in Urban Water Management Plans, General Plans and other planning and regulatory tools.

- The PAD states: "Salmon and steelhead habitat was substantially enhanced through implementation of the current flow schedule."
    - A more accurate statement would be: "harms to habitat by construction and operation of the dams and diversion were partially mitigated by implementation of the current flow schedule."

4.6.2 Regulatory Requirements

- The PAD states: "The Project is further limited by PG&E's existing water rights and water supply agreement with PVID."
    - We request that the licensee, FERC and PVID provide additional information on how the PVP is limited by PG&E's contractual arrangements with PVID. We request that FERC provide a full accounting of water actually diverted, stored or rediverted under PG&E's water rights, since 1972, along with projections for such diversions, storage and rediversions for the next 50 years. Similar data should also be made available for PVID under their water rights and contracts, both retroactive to 1972 and prospective to 2072.

4.6.2.1 FERC License

In Article 58 of the current PVP license, "FERC reserves authority to require modifications to the Project license as may be necessitated by modification by the California State Water Resources Control Board of its Decision 1610."

The revisions to D-1610 proposed by SCWA in its pending petitions before the SWRCB, as analyzed in its the Fish Habitat Flows and Water Rights Project DEIR [36] (Fish Flow Project), found that Eel River diversions are not necessary to meet Russian River water demands during

---

[36] The Fish Flows DEIR can be found at http://www.scwa.ca.gov/files/Fish%20Flow%20DEIR%20Full%20Document.pdf; the Errata at http://www.scwa.ca.gov/files/FishFlow_DEIR_Errata_012617_FINAL_Remediated.pdf.

most years, with existing management, diversions, demands and projected demands. Based on our review of SCWA's Fish Flow DEIR and FOER's comments thereon,[37] there is insufficient evidence to support the hypothesis that diversions from the Eel River through the PVP are necessary for the protection of aquatic species or recreational resources on the Russian River.

Once salmon and steelhead were actually listed under the federal ESA, NMFS found that the flows provided in the modified 2000 license would jeopardize the existence of Eel River chinook and steelhead, but not Russian River salmonids.

- The PAD states: *"*During ESA Section 7 consultation, NMFS evaluated the preferred action of the FERC proceeding in regards to its potential effects on listed salmonids in both the Eel River and Russian River (Table 4-6). On November 26, 2002, NMFS issued its Biological Opinion for the proposed FERC license amendment and concluded that the proposed action would likely jeopardize the continued existence of Southern Oregon/Northern California Coho Salmon, California Coastal Chinook Salmon, and Northern California Steelhead (NMFS 2002). The RPA significantly reduced power generation output from the Project and the amount of water diverted to the East Branch Russian River that technically becomes abandoned (from a water right perspective), but is beneficial to downstream purposes, including contributions to storage in Lake Mendocino."
    - We request a quantitative analysis of reduced power generation and its relationship to reduced diversion flows.
- The PAD states: "PG&E's initial implementation of the RPA in 2004 followed operational parameters that were later determined inconsistent with NMFS' interpretation of the RPA conditions."
- "In 2006, PG&E adjusted operations to comply with NMFS' interpretation, which has

---

[37] FOER's comments on the Fish Flows DEIR are available at https://eelriver.org/wp-content/uploads/2017/04/FishHabitatFlowsDEIR-FOER_Comments-0309017.pdf

incrementally reduced diversions to the East Branch Russian River, including diversion of available water during periods of spill at Lake Pillsbury."

- "Recent winter droughts combined with the RPA requirements have resulted in challenging license compliance issues for PG&E, resulting in the need for flow variances from FERC to avoid license compliance violations."
    - These passages show that the licensee has not always been able to comply with the RPA. The EIS should describe periods and incidents of noncompliance, analyze the impacts to aquatic resources, and address the evident inadequacy of the RPA and of current compliance and mitigation measures.

4.6.2.2 Water Rights

- The PAD states: "This abandoned water from powerhouse operations adds significant inflow to Lake Mendocino and benefits downstream users."
    - We request additional information of the contributions of abandoned Eel River diversions to Lake Mendocino.
- The PAD states: "PG&E has three licensed water rights for the Project diversions and two pre-1914 water rights (Table 4-7). License 1424, with a priority date of March 12, 1920, allows PG&E to divert and store up to 102,366 acre-feet per annum (afa) at Lake Pillsbury for the beneficial uses of hydropower generation and incidental Fish and Wildlife Protection and Enhancement. License 1199, with a priority date of August 15, 1927, allows PG&E to divert and store up to 4,500 afa at Lake Pillsbury for irrigation purposes within the PVID service area. License 5545, with a priority date of March 11, 1930, allows PG&E to divert to storage up to 4,908 afa of water at Lake Pillsbury and to directly divert up to 40 cfs from the Eel River for irrigation purposes within the PVID service area in the Russian River Watershed. PG&E claims a pre-1914 water right to directly divert up to 340 cfs from the Eel River, as specified in Statement of Water Diversion and Use (SWDU) 1010, for power generation and irrigation use. PG&E also claims a pre-1914 water right to store up to 1,457 afa in

Van Arsdale Reservoir, as specified in SWDU 4704, for power, irrigation and domestic use. PG&E has three licensed water rights for the Project diversions and two pre-1914 water rights (Table 4-7). License 1424, with a priority date of March 12, 1920, allows PG&E to divert and store up to 102,366 acre-feet per annum (afa) at Lake Pillsbury for the beneficial uses of hydropower generation and incidental Fish and Wildlife Protection and Enhancement. License 1199, with a priority date of August 15, 1927, allows PG&E to divert and store up to 4,500 afa at Lake Pillsbury for irrigation purposes within the PVID service area. License 5545, with a priority date of March 11, 1930, allows PG&E to divert to storage up to 4,908 afa of water at Lake Pillsbury and to directly divert up to 40 cfs from the Eel River for irrigation purposes within the PVID service area in the Russian River Watershed. PG&E claims a pre-1914 water right to directly divert up to 340 cfs from the Eel River, as specified in Statement of Water Diversion and Use (SWDU) 1010, for power generation and irrigation use. PG&E also claims a pre-1914 water right to store up to 1,457 afa in Van Arsdale Reservoir, as specified in SWDU 4704, for power, irrigation and domestic use."

- These claimed water rights will require careful scrutiny. The licensee and PVID should be prepared to support these general claims of water rights with evidence of actual, beneficial use of water so that the Commission and relicensing participants can assess and evaluate water rights to Eel River waters.
- We also request additional information regarding how the water rights held by PVID and PG&E line up with the storage amounts in Lake Pillsbury and Lake Mendocino.
- The EIS should also consider and explain the extent to which storage may be available or may feasibly be made available on the Russian River side of the Project. This might include making additional storage available in the Lake Mendocino reservoir, in groundwater reserves, or in alternative small scale

surface storage. Information about the practicability and cost/ benefit ratio of such storage solutions would be critical to evaluating the feasibility of potential reconfigurations of Project flows.

4.6.2.3 Water Supply Agreement

- The PAD states: "PG&E has a contract to sell and deliver water to PVID at the tailrace of the Potter Valley Powerhouse. PG&E's obligation under the current contract is to deliver up to 19,000 ac-ft of water to PVID at a rate not to exceed 50 cfs, provided the water is available and permitted per PG&E's applicable water rights."
    - Please see the comments above on Water Rights

.

4.7 Project Facility Maintenance

4.7.1 Inspections

The PAD states: "Scott Dam and Cape Horn Dam are inspected by an independent consultant under contract with PG&E every 5 years in compliance with CFR Title 18, Part 12, Subpart D. The Part 12D safety inspections are intended to identify any actual or potential deficiencies of Project facilities or adequacy of Project maintenance, surveillance, or methods of operation that might endanger public safety."

FERC comes to the question of relicensing the Eel River dams in the immediate aftermath of a near-disaster at Oroville Dam and a series of revelations that raise significant questions about the adequacy of dam safety review by both FERC and the California Division of Safety of Dams (DSOD). PG&E and FERC must ensure that critical dam safety and stability information and data from the public and from peer-review under CEII restrictions are made available for review.

In the aftermath of the Oroville crisis, catastrophic risk assessment expert Robert Bea (at the Center for Catastrophic Risk Management, UC Berkeley) called the near-disaster "a

regulated failure."[38] Bea told KQED that the Division of Water Resources "and other oversight bodies, such as the Federal Energy Regulatory Commission, are using standards that don't account for the deterioration of infrastructure over time or outdated technology."

Prof. Bea wrote "it is likely that the wrong standards and guidelines are being used to re-qualify many critical infrastructure systems for continued service. The majority of these standards and guidelines were originally intended for design, not re-qualification or re-assessment of existing aged infrastructure systems that have experienced 'aging,' 'technological obsolesce,' and increased risk (likelihoods and consequences of major failures) effects. Inappropriate standards and guidelines are being used to re-qualify these infrastructure systems for continued service."[39]

In the aftermath of the Oroville events and Prof. Bea's assessment of the adequacy of regulatory standards and guidelines used to determine and assure dam safety, it is incumbent on FERC to reassess those standards and to assure that it is applying the appropriate level of scrutiny to the questions surrounding the safety of the present Project.

4.8 Project Generation and Outflow Records

Our assessment of PVP's power production is that power generation declines disproportionately to reductions in diversions. But even above-average flows in 2012 (65Kaf) appear to have produced about half the average power (20K MWh). (See p 4-56).
We request additional power generation data at a scale sufficient to evaluate the relationships between Project flows and power production.

4.10.3 Temporary Variance

- The PAD states: "Over the term of the current license, PG&E requested and received approval to temporarily modify minimum flow requirements, typically due to the

[38] See https://ww2.kqed.org/news/2017/04/18/report-design-building-and-upkeep-flaws-led-to-oroville-spillway-failure/.
[39] See *Preliminary Root Causes Analysis of Failures of the Oroville Dam Gated Spillway* R. G. Bea Center for Catastrophic Risk Management University of California Berkeley April 17, 2017.

following circumstances: temporary modifications to flow in order to conduct maintenance and/or testing of Project facilities; and temporary variance of minimum flow requirements due to dry water year conditions or low storage at Lake Pillsbury."

- We request additional information on the number of variances granted, and the circumstances under which they were sought. Such variances may represent a failure of the utility to abide by the terms of the RPA.
- We further request additional information as to where the variances were granted and to what degree flows were reduced on the Eel and Russian Rivers.
- We ask that the EIS analyze and disclose all violations and variances to discern whether additional protective measures, flow levels, storage requirements, or other mitigation measures should be required to meet the intent of the RPA. Temporal losses to habitat or fisheries due to the variances must be identified, along with proposed mitigation measures to address those losses, both cumulatively and individually.
- As demonstrated by PVID's voluntary reductions of their diversions (reportedly allowing several thousand acre feet to remain in L. Pillsbury) within the Temporary Variances and work of the PVDWG 2015, 1016, we believe that the diversions allotted to PVID measured at E-16 could be substantially reduced, both keeping storage levels at Lake Pillsbury higher through the first rains of the water year, and providing more storage for water releases and blockwater utility to support incoming salmonid migration in the fall. We request that the EIS evaluate this alternative operation.

4.11 Proposed License Modifications

As noted above and throughout, FERC must require any new license issued for the Project to be modified in order to comply with federal and state law and regulation. In light of the license application, we ask that FERC ensure that the following are analyzed: 1) impacts on ESA-listed fisheries; 2) fish passage; 3) allowance for climate change related impacts; 4) inability to meet conditions of the RPA; 5) inability to meet Basin Plan objectives and water

quality standards; 6) mercury contamination in the Lake Pillsbury reservoir; 7) balance between power production and public trust resource protection required under the Federal Power Act.

The EIS must consider a comprehensive suite of potential license modifications sufficient to fully address each and all of these deficiencies.

5.0 Description of Existing Environment

5.1 Water Use and Hydrology

The EIS must describe water use in the kind of detail necessary to assess the environmental impacts of the proposed relicensing of Project operations. The EIS must provide a detailed and quantified accounting of water demand and identify the sources of consumptive water for Russian River users, providing actual water needs, and actual water uses within a working model demonstrating the validity and accuracy of the claims.

We request that the EIS provide a full and detailed accounting of existing, perfected water rights that may be relevant to Project operations, and a clear explanation of unaccounted-for losses. In addition, the EIS should outline what crops are being grown, in which locations, over what acreage, using what irrigation methods and water quantities during the respective growing seasons. This information and data must also include lands serviced by the Potter Valley Irrigation District.

We request that the EIS provide a summary of power production by the Project which is as granular as possible – daily or hourly production.

The change in Project operations occasioned by the "reinterpretation" of the RPA resulted in a much sharper reduction in power production than in net water diversions. It appears that, before PG&E was corrected by the resource agencies, the operator was continuing to send any flows it considered 'excess' to the Russian River side. We request a cataloging of the delta in diversions before and after the "reinterpretation."

5.1.3.2 Climate and Precipitation

The PAD describes the climate and precipitation in the Project area without noting

documented changes in precipitation, hydrology, and temperatures across the region over the last century.[40] These trends appear consistent with the shifts predicted to accompany warming global temperatures.[41] Similarly, while the PAD states that "Rainfall in the Upper Eel River drainage is variable," it does not reflect on the paleogeologic record, which provides evidence that the Eel River region has seen both more severe droughts and far greater floods in the last couple of millennia than during the historic period of record.[42]

Our climate is much more variable than we have thought over the last century. This means that climate disruption, projected to increase that range of variability, makes such extremes more likely over time. But the extremes also are likely to be still more extreme: deeper, hotter droughts; but also atmospheric rivers even larger than those recorded in the beds of sediment off the Eel's mouth.

We request that the EIS analyze a meaningful suite of scenarios, reflecting the best available scientific data and analyses, which project potential changes in precipitation,

---

[40] See Asarian, J.E. and J. Walker. 2016. Long-Term Trends in Streamflow and Precipitation in Northwest California and Southwest Oregon, 1953-2012. Journal of the American Water Resources Association (JAWRA) 52: 241-261. DOI: 10.1111/1752-1688.12381; Asarian, J.E. 2015. Long-Term Streamflow and Precipitation Trends in the Eel River Basin. Prepared by Riverbend Sciences for Friends of the Eel River, Arcata, CA. 30p. + appendices. https://eelriver.org/wp-content/uploads/2016/08/Streamflow-and-Precipitation-Trends.pdf; Asarian, E. 2015. Assessment of altered hydrologic function, dams, and diversions within the Southern Oregon/Northern California Coast evolutionarily significant unit of coho salmon, Version 2. Prepared for NOAA Fisheries, Arcata, CA. 73 p. + appendices. https://archive.org/details/soncc_hydrologic_report_20151002_revised.

[41] See, e.g., Luce, C., B. Staab, M. Kramer, S. Wenger, D. Isaak, and C. McConnell. 2014. Sensitivity of Summer Stream Temperatures to Climate Variability in the Pacific Northwest. Water Resources Research 50:3428–3443. doi: 10.1002/2013WR014329, and Null, S.E., J.H. Viers, M.L. Deas, S.K. Tanaka, and J.F. Mount. 2013. Stream Temperature Sensitivity to Climate Warming in California's Sierra Nevada: Impacts to Coldwater Habitat. Climatic Change 116:149–170. doi: 10.1007/s10584-012-0459-8.

[42] See, e.g., Ingram, B.L., and F. Malamud-Roam. 2013. The West Without Water: What Past Floods, Droughts, and Other Climatic Clues Tell us About Tomorrow. University of California Press.

temperature, and climate across the region in order to provide a meaningful analysis of potential effects on Project operations. This should include power production and water diversions, as well as the contributions of Project operations and the Project environment to cumulative effects which may be powerfully shaped by changes in precipitation, air and water temperatures, hydrology, and climate patterns.

5.1.3.3 Runoff

- The PAD states: "Total annual unimpaired inflow at Cape Horn Dam for the period 1925–2016 averaged approximately 478,000 ac-ft and ranged from approximately 26,000 ac-ft to more than 1,303,000 ac-ft."
    - We request further information and analysis of these numbers of the period between 1925 and 2016. The seasonality and variability of flows are factors which affect hydrology and biology, as well as Project operations and potential license changes.
    - We have learned from the recent drought that the RPA flows could not be met at the very time when fisheries most needed them. We request further information and analysis of what the level of decline in precipitation, or change in variability, would render the Project impossible or uneconomic to operate.
    - The EIS and relicensing process must propose and analyze possible mitigations for decreased precipitation, increased air and water temperatures, and changes in the timing of runoff over the coming decades. The best available science appears to demonstrate that we cannot assume stationarity for hydrologic conditions in the upper mainstem Eel River; rather, there are clear trends, likely to become clearer over time.[43]

---

[43] See Asarian, J.E. and J. Walker. 2016. Long-Term Trends in Streamflow and Precipitation in Northwest California and Southwest Oregon, 1953-2012. Journal of the American Water Resources Association (JAWRA) 52: 241-261. DOI: 10.1111/1752-1688.12381, and Rheinheimer, D.E., Null, S.E., and J.H. Viers. 2016. Climate-Adaptive Water Year Typing for (footnote continued)

5.1.3.4 Air Temperature

The PAD reports air temperature data from Scott Dam from 2009 to present. We request that the EIS consider available data for the region across the longest possible record. The EIS should consider, disclose, and analyze air temperature data with respect to the trends noted above, which appear to reflect increasing temperatures associated with climate change. Air temperatures affect water temperatures, a critical limit on salmonid biology, but also evaporation rates from the Project reservoirs.

Further, we request that the EIS's consideration of climate change scenarios include an appropriate air temperature component.

5.1.4 Existing and Proposed Uses of Project Water

- The PAD states: "Existing uses of water passing through the Project area include hydroelectric power production; agricultural, domestic, municipal, and industrial water supply; aquatic and wildlife habitats; and recreation. PG&E does not propose to modify the existing uses of Project water. Regulatory flow requirements in the FERC license (FERC 1983 and 2004) and National Marine Fisheries Services' (NMFS) Reasonable and Prudent Alternative (RPA) (NMFS 2002) constrain Project operations and resulting uses of Project waters."
    - As noted, storage in the requirements of the RPA have not been met; the existing license does not comply with current requirements including fish passage and water quality; and the D.1610 DEIS indicates that Eel River diversions are not necessary to Russian River fisheries. Thus, PG&E should be proposing to modify existing uses of Project water, at least as to flow levels and storage requirements. We request that FERC's EIS and alternatives reflect these facts.

5.1.4.2 Agricultural, Domestic, Municipal, and Industrial Water Supply Uses

- The PAD states: "Some water exiting the Potter Valley Powerhouse Tailrace is

---

Instream Flow Requirements in California's Sierra Nevada. Journal of Water Resources Planning Management, 142(11): 0406049.

diverted to the Potter Valley Irrigation District (PVID), consistent with existing contractual obligations and regulatory flow requirements of the FERC Project license. PG&E has consumptive water rights associated with the Potter Valley Project to serve irrigation demands within the PVID place of use (Section 4.0). Water downstream of Lake Mendocino is used for agriculture, domestic, municipal and industrial purposes."

- The EIS must provide detailed information identifying the actual historic volumes, times and rates delivered to PVID diversions from the E. Branch Russian River at the PG&E tailrace since 1983.
- PG&E and PVID should identify any additional water diversions from E. Branch Russian River below the East and West Canals (water "deemed abandoned" from PG&E's tailrace), under what water rights held by PVID or others, as well as groundwater extractions within the land area served by PVID.
- PG&E and PVID should supply information regarded reported "return flows" to E. Branch Russian River from lands served by the District, with gaging data where available to support reported data.
- In the interest of supporting the efficient and beneficial uses of water diverted by PVID, the licensee should provide a full accounting of uses by all recipients of PVID water, identifying domestic use and demands, or, for agricultural use, the types and acreage of crops, volumes of water used and at what rates per type of crop accounted for on a weekly basis, and the type of irrigation (flood, spray, drip, etc) used by crop type, acreage and seasonality, along with analysis to support the efficiency of each type of irrigation or alternative methods of irrigation.
- PG&E and PVID should provide an accounting of losses through PVID's unlined irrigation canals and ditches, due to seepage, leakage or drainage to groundwater or other storage, as well as losses to evaporation.

- The EIS should also provide an accounting and water balance for water diversions and other losses to describe and model the hydrology of the East Branch Russian River between Potter Valley and Lake Mendocino. Contributions (flows, volumes) over the water year of water diverted from the Eel River should be accounted for. The Kamman Report (Exhibit 1) and modeling for SCWA's Low Flow Project DEIR describe substantial unidentified and unaccounted-for stream-flow losses in the mainstem Russian River – almost 38,000 af/year:
  - "Non-permitted water rights and diversions may be contributing to significant stream flow losses, which if curtailed, could allow for increased flows in the Eel River." (Exhibit 1, at p. 3)
  - "Many of these losses are attributable to unpermitted diversions and, if eliminated, would leave more water in the [Russian] river and result in higher flows at minimum flow compliance points/gauges. In turn, this would reduce the volume of releases needed from Lake Mendocino to meet the downstream minimum instream flow needs." (Exhibit 1, at p. 6)

The EIS should identify the sources of these losses between Lake Mendocino and Dry Creek, their legal status, and whether or not any or all illegal and unpermitted diversions can be eliminated or significantly curtailed, without adjudication of the Russian River.

FERC should also consider the findings and recommendations of the Russian River Independent Science Review Panel Report (ISRP).[44] The statement of purpose includes:

- "to develop a conceptual model of the hydrologic and geohydrologic system for a portion of the Russian River Watershed. The conceptual model will synthesize data from existing monitoring activities and studies into a comprehensive analysis of the mechanisms and processes that control the distribution and occurrence of

[44] See www.russianriverisrp.org

water in the study area." … "ISRP can potentially play a significant role in increasing the level of scientific understanding of the river system, providing a stronger basis for water management decisions and policies in the future…". Sept. 9, 2016

5.1.4.3 Aquatic and Wildlife Habitats

- The PAD states: "The Potter Valley Project supports a variety of aquatic and wildlife resources and habitats. Aquatic habitat in the vicinity of the Project includes coldwater stream habitat in the Eel River benefiting Chinook salmon, steelhead, and other native and introduced aquatic species, and in the East Branch Russian River benefiting resident rainbow trout and other native and introduced aquatic species. Releases from storage in Lake Mendocino support anadromous salmonids (Chinook salmon, Coho salmon, and steelhead) and other aquatic species in the Russian River."
    - We request that the EIS analyze the extent to which the "coldwater stream habitat in the Eel River" actually results in net benefits to "Chinook salmon, steelhead, and other native and introduced aquatic species." This is especially important given that 1) the Project blocks fish passage to the upper basin and restricts passage into and out of the interdam reach; 2) salmonid and other native fish reproduction in the interdam reach is affected by pikeminnow predation and delays in downstream migration.
        - We request that the EIS detail and offer additional information on the releases from Lake Mendocino to support native Russian River fisheries. We specifically ask for information on the extent to which diversions from the Eel River are necessary to support those releases under current practices, and consider how adjustments in Lake Mendocino management and/or increases in Lake Mendocino storage could replace such demands to the extent they do exist.

5.1.4.5 Regulatory Flow Requirements

Eel River

- The PAD states: "Releases near the bottom of Lake Pillsbury provide cold water in the 12-mile-long reach between the Project dams from late spring through fall, which help sustain high-quality rearing habitat for juvenile Chinook salmon and steelhead. However, the cold water releases can delay juvenile outmigration, exposing migrating fish to inhospitable water temperatures in the Lower Eel River. PG&E, CDFW, and NMFS have experimented with required 'block water' flow release strategies to encourage timely juvenile outmigration."
    - We request additional information on the actual use by salmonids of this "high-quality rearing habitat for juvenile Chinook salmon and steelhead."
    - One important constraint on the effectiveness of blockwater releases in promoting downstream migration has been the availability of warmer water from the top of the Lake Pillsbury reservoir in the spring. We request additional information and analysis on which modifications to Project infrastructure would provide warm-water flows on demand during times when young salmon and steelhead need to be heading downstream.
    - Another constraint on the effectiveness of blockwater has been quantity. We request that the EIS consider whether additional blockwater would be helpful, and to what extent, in mitigating the harms to fisheries associated with the Project.
    - Experimental blockwater releases intended to promote downstream migration of salmonids led to unexpected upstream migration of lamprey. The EIS must document, consider, and analyze what flow regime (as well as what physical structures) would be optimal to promote lamprey passage up and downstream through the Project area, as well as what flows may be necessary simply to prevent continuing harm to lamprey passage and reproduction.
- The PAD states: "It should be noted that following issuance of the Amended FERC

License in January 2004, PG&E initially diverted more water during the spring period than was technically allowed by the rule curve exceptions clause in Section E.5 of the RPA. PG&E made diversions from 2004 through 2006 based on protocols agreed to by Department of Interior (DOI) and FERC (Oak Ridge National Laboratory) hydrologic modelers during the license amendment process. These protocols allowed diversions exceeding minimum releases to the East Branch Russian River plus PVID's allotment, when Lake Pillsbury storage was below the Target Storage Curve, as long as minimum flow requirements (including block flow releases) were being met in the Eel River below Cape Horn Dam and additional water was available at the diversion due to spillage from Lake Pillsbury and/or accretion between the two dams. During the license amendment process, all modeling of impacts on water supply and aquatic resources for each proposed flow schedule evaluated and incorporated this flexibility. However, the literal wording of the Section E.5 exception clause of the final RPA failed to reflect this flexibility. After this issue was identified by the resource agencies, PG&E began operating the Project per literal interpretation of Section E.5 beginning in 2007."

  - We request additional information regarding the resource agencies declining to allow the diversion of additional flows out of the Eel in the spring.

5.1.5 Water rights

- The PAD states: "PG&E has three licensed water rights for the Project diversions and two pre-1914 water rights (Table 4-7), as described in Section 4.6.2.2. PG&E holds water rights for both power and consumptive uses (SWRCB 2016). Water is diverted from the Eel River for generation at Potter Valley Powerhouse in the East Branch Russian River Watershed. After passing through the Potter Valley Powerhouse, a portion of the powerhouse outflow is diverted via canals to PVID for consumptive use. The remaining outflow is abandoned to the East Branch Russian River. This abandoned water from powerhouse operations provides inflow to Lake Mendocino and benefits many downstream users."

- We request that a thorough technical analysis and justification for the flows released to the East Branch Russian River (as measured at gage E-16, diversions to the tunnel), demonstrating that no adverse biological impacts would occur by lowering the flows during normal, dry and critical dry year types.
- As demonstrated by PVID's voluntary reductions of their diversions (reportedly allowing several thousand acre feet to remain in L. Pillsbury) within the Temporary Variances and work of the PVDWG 2015, 1016, we believe that the diversions allotted to PVID measured at E-16 could be substantially reduced, both keeping storage levels at L. Pillsbury higher through the first rains of the water year, and providing more storage for water releases and Block Water utility to support incoming salmonid migration in the Fall.
- We request that the a full accounting and modeling of water use, diversions, storage and return flows within PVID customers. Allowing increased releases at E-2 below Scott Dam and at E-11 below Cape Horn Dam would also increase juvenile steel rearing habitat (per Available Habitat Area calculations. See, Critical Request for 2015 Flow Variance Due to Limited Water Availability, PG&E, May 13, 2015 filed with FERC, pg. 4)

5.1.6 Hydrology

We request that the EIS includes a full analysis of the potential and probable impacts of climate change on future conditions in the Project area especially in regards to an analysis of future fish habitat conditions.

Eel River Diversion Compared to Unimpaired Eel River Flow

- The PAD states: "Annual Project diversions out of the Eel River constituted approximately 33% of the unimpaired flow in the Eel River at Cape Horn Dam on average over the historic period (1925–1978). During the transition period (1979–2006), annual Project diversions were approximately 26% of the unimpaired flow in

the Eel River at Cape Horn Dam. After the RPA reinterpretation (2007–2015), the Project diversions have been 21% of the unimpaired flow at Cape Horn Dam, on average."

- We request additional information and analysis on the yearly changes in unimpaired flow throughout this time period.

Powerhouse Releases Compared to Total East Branch Russian River Flow

- The PAD states: "Powerhouse releases significantly supplement natural flows in the East Branch Russian River, but the contribution has been declining in recent years with changes in license requirements. Annual powerhouse releases constituted approximately 59% of the total flow in the East Branch Russian River above Lake Mendocino (USGS stream gage #11461500, Russian River near Calpella, California) on average over the historic period (1973–1978). During the transition period (1979–2006), annual powerhouse releases were approximately 58% of the total flow in the East Branch Russian River. After the RPA reinterpretation (2007–2015), the powerhouse releases have been 47% of the total flow on average."
  - We request that the EIS provide greater detail here in order to describe the impacts of Project operations and potential modifications to the license.

5.1.6.4 Powerhouse Flows: Summary of Generation and Dependable Capacity

- The PAD states: "Power generation and outflow data for the Project were separated into the same time periods as the hydrologic analysis (Section 5.1.6.2) to reflect changes in Project operations. Available generation data spans 1972 through 2016 (PG&E 2016). Figure 5.1-8 depicts average monthly generation from 1972 through 2016. Average annual generation at the Potter Valley Powerhouse was approximately 53,600 megawatt hours (MWh) during historic operations (1972–1978), 49,700 MWh during transition operations (1979–2006), and 19,900 MWh for current operations (2007–2016)."
- "Average annual and monthly energy production for current operations (2007–2016) is summarized on Table 5.1-7 and Figure 5.1-9. As identified on Table 5.1-7, Project generation from 2013 to 2016 was affected by implementation of major multi-month

construction outages and drought flow variances. Therefore, the year that most accurately reflects the dependable generating capacity of the Project is 2012 (a dry year) when annual generation was 20,155 MWh."

- "Per FERC requirements, a summary of Project generation and outflow records for operations (annually and by quarter) for the five years preceding filing of the PAD (2012–2016) is included in Table 5.1-8. This summary presents the last complete five years of available records for Project operation. During this period, annual generation ranged from 8,562.3 MWh (2015) to 20,155.1 MWh (2012), and diversion flows ranged from 31,200 ac-ft (2015) to 65,200 ac-ft (2012)."
    - We request additional information regarding the relative utility of the Project's power production and its related economic value to the utility and to its customers. We request that the EIS analyze PVP's power production in terms that illuminate its actual dollar value as well as its importance to the operation of the regional grid, its utility in meeting peaking demands, and any other relevant ways in which Project power production is particularly useful – or to which it is actually surplus to consumer demand, or could be replaced at lower cost, or with lower impacts, or both.
    - We request additional information to determine if there is a minimum flow regime beyond which the project does not make economic sense.
    - The EIS should identify current and future capital or significant maintenance projects for the PVP that would have to be accomplished within the proposed license period of 50 years, along with cost estimates, and potentials for recovery through CPUC rate adjustments.

5.1.6.5 Reservoir Storage Lake Pillsbury

- The PAD states: "Lake Pillsbury has a gross storage capacity of 76,876 ac-ft at the top of the gates (elevation 1,828.3 ft) based on bathymetric data collected in 2015-2016 (PG&E 2017). Reservoir storage and surface area profiles are shown in Table 5.1-9 and Figure 5.1-10. The volume of water storage is approximately 20% of the average annual runoff

in the watershed above Scott Dam. Lake Pillsbury generally reaches its peak storage in April or May, and is drawn down throughout the late spring and summer, reaching a low point somewhere between November and January, depending on hydrologic conditions. Lake Pillsbury is generally drawn down to between 15,000 and 25,000 ac-ft of storage, with some dry years drawn down as low as approximately 10,000 ac-ft. Lake Pillsbury is not drawn down further than 10,000 ac-ft due to concerns of bank instability in the reservoir and the potential for sloughing material to block the outlet needle valve or be released downstream creating high turbidity and streambed sedimentation. Verification of the minimum storage level necessary to protect project infrastructure and downstream resources is part of on-going analysis and discussions with resource agencies."

- The Lake Pillsbury reservoir storage rule curve is currently mandated by DSOD. They do not allow early gate closure in late Winter or early Spring to maintain maximum storage going into the dry season, but must release sufficient water to allow for future storm inflows, whether or not they actually occur, until a defined date.
- We request that the proposed revisions to the storage rule curve account for incoming weather patterns, including "atmospheric river" predictions. SCWA has been developing such Forecast Informed Reservoir Operations (FIRO) over the past few years for a proposed storage and release management strategy and reoperation of Lake Mendocino to maximize usable storage in the water supply pool.
- We request additional information and an analysis of the implications of increased seasonal variation and reduced storage in Lake Pillsbury's storage for Project operations, fisheries flows and other mitigations.
- We request additional information on whether water quality conditions are significantly affected by variations in Lake Pillsbury storage.

5.2 Water Quality

5.2.3 State Water Quality Standards

Mercury and Methylmercury

Please note the State Water Board has recently promulgated additional protective standards for mercury which must be reflected in the EIS and in any license FERC may approve for the Project. As the SWB website notes:

> "Mercury is negatively impacting the beneficial uses of many waters of the state by making fish unsafe for human and wildlife consumption. Although mercury occurs naturally in the environment, concentrations of mercury exceed background levels because of human activities. Gold and mercury mines and atmospheric deposition are the predominant sources of mercury, with minor contributions from industrial and municipal wastewater discharges and urban run-off."
>
> "On May 2, 2016, the State Water Resources Control Board adopted Resolution 2017-0027, which approved "Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions." Resolution 2017-0027 provides a consistent regulatory approach throughout the state by setting mercury limits to protect the beneficial uses associated with the consumption of fish by both people and wildlife. Additionally, the State Water Board established three new beneficial use definitions for use the State and Regional Water Boards in designating Tribal Traditional Culture (CUL), Tribal Subsistence Fishing (T-SUB), and Subsistence Fishing (SUB) beneficial uses to inland surface waters, enclosed bays, or estuaries in the state. The State Water Board approved one new narrative and four new numeric mercury objectives to apply to those inland surface waters, enclosed bays, and estuaries of the state that have any of the following beneficial use definitions: COMM, CUL, T-SUB, WILD, MAR, RARE, WARM, COLD, EST, or SAL, with the exception of waterbodies or waterbody segments

with site-specific mercury objectives."[45]

The Lake Pillsbury reservoir is listed under §303(d) of the Clean Water Act for mercury, and the rest of the Eel Watershed is listed under the Clean Water Act for temperature and sediment concerns. Under the Basin Plan established for the Eel River by the State Water Resources Control Board, the Eel River in the Project Area and reaches below is subject to the following beneficial uses which would trigger the new standards referenced above: COMM, WILD, RARE, WARM, and COLD.[46] It is our understanding that at least some portions of the Eel are or should be recognized as having CUL, T-SUB, and SUB beneficial uses as well, given the importance of fisheries to tribal nations resident along the Eel.

Mercury is present in Project area geologic formations, and is deposited from atmospheric sources. However, the elemental form of mercury is less dangerous than the methylated form, which can be more easily absorbed by life forms, tends to bioaccumulate up food chains, and has been linked to a range of harms in many different life forms. The Lake Pillsbury reservoir, which like many lakes becomes eutrophic as its upper layer warms and its lower layer becomes anoxic, provides the setting in which anaerobic bacteria methylate mercury in reservoir sediments and become the means by which that methylated mercury begins to accumulate in the food chain. Mercury poses clear risks for birds, wildlife and humans which eat fish that contain mercury.[47]

We request additional information and an analysis of the implications other sources of mercury observed in the Project area. Specifically, we request additional information on the

---

[45] See http://www.waterboards.ca.gov/water_issues/programs/mercury/

[46] See Basin Plan, 3/05, p 2-9.00, available at http://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/083105-bp/03_bu.pdf

[47] See Chan, H.M., Scheuhammer, A.M., Ferran, A., Loupelle, C., Holloway, J., and S. Weech. 2003. Impacts of Mercury on Freshwater Fish-Eating Wildlife and Humans. Human and Ecological Risk Assessment: Vol. 9, No. 4, pp. 867-883.

level of threat to biota and humans, the potential implications of this level of mercury contamination for fisheries recovery and wildlife in the Project area, and the proportion of the mercury and methylmercury load can be attributed to the existence and operations of the Project.

We request that the EIS fully assess the level of mercury contamination in the Project area, including above the Lake Pillsbury reservoir and below Cape Horn dam. The EIS should describe the nature, extent, and concentrations of mercury contamination in sufficient detail to perform at least a preliminary assessment of potential mitigations, including dam decommissioning and sediment removal. We request additional information and an analysis of whether it is possible, feasible, or even desirable to treat the contaminated sediments and what is the optimal outcome for biological systems and human health.

Additionally, we request an analysis of how much more mercury can be expected to accumulate and to methylate if the Project is operated for an additional 30, 50, or 100 years. The EIS should also assess the potential for mercury to move into the rest of the Eel River under various dam failure scenarios.

Temperature

Although there is an extensive record of stream temperatures in the immediate Project area, we lack adequate data for downstream flow and temperature.

We request additional information and an analysis of projections of likely and potential future conditions in the Project area, especially in comparison to known temperature thresholds which affect the survival and reproduction of steelhead and salmon. The EIS should consider, analyze, and disclose reasonable projections of the likely future range of conditions in the Project area, including how changes in precipitation and air temperatures are likely to affect stream temperatures.

Sediment

In addition to the points noted above regarding mercury contamination, we request additional information regarding sediment, particularly in the Lake Pillsbury reservoir. We request additional information on other contaminants in addition to mercury that should be considered, how quickly the sediment accumulation in the reservoir is displacing remaining

storage volume, and to what extent does that reduction substantially alter operator's ability to manage flows within the parameters of the RPA.

We request additional information and an analysis of sediment removal in the event of dam removal.

5.3 Fish and Aquatic Resources

- The PAD states: "Releases from the bottom of the reservoir provide cold water during the late spring through summer months for salmonid rearing in the Eel River downstream of the reservoir."
    - We request that the EIS evaluate the net effect of the Project and its operations on Eel River salmonids and other aquatic resources. Chinook salmon generally are downstream on their way to the ocean in the late spring of their first year. Steelhead generally require a year in freshwater. However, steelhead in the Project area appear to suffer a double blow from pikeminnow predation and migration timing delayed by the very cold water the PAD here presents as a singular benefit.
- The PAD states: *"*Water from Lake Mendocino is used in Mendocino and Sonoma Counties for irrigation, municipal and domestic water supply, recreation, and support of salmon and steelhead populations in the Russian River."
    - We request additional information and an analysis of these claims in detail.
- The PAD states: "As a result of Project storage and diversions, hydrologic characteristics (magnitude and timing of flows) in the Eel River are modified below Cape Horn Dam, and flows in the East Branch Russian River are augmented."
    - We request additional information and an analysis of the consequences for Eel River fisheries of those modifications, and what mitigations are required to reduce them to a level consistent with law, regulation, fisheries recovery and sustainability.
- The PAD states: "Water temperatures in the Eel River below Lake Pillsbury are colder during the late spring and summer than under unimpaired conditions. The cold water during summer provides highly suitable rearing habitat for juvenile steelhead. This, along with nutrients released from the reservoir, promotes rapid fish growth. However, cold water

temperature in spring can delay the outmigration of juvenile salmonids until a time when downstream temperatures are inhospitable. Pulse flow releases have been used to encourage timely outmigration."

- We request additional information and an analysis in the EIS to evaluate and disclose the actual effectiveness of such pulse flow releases. Our understanding is that the record of such releases is quite limited, and that there is little evidence of their biological effectiveness in practice. Further, it is our understanding that both the limited amount of stored water available for correctly timed pulse flow releases, as well as the physical constraints imposed by Project infrastructure, sharply limit the potential utility of such releases.
- The EIS should consider whether additional blockwater storage, including blockwater volumes reserved for both fall and spring use, could enhance fishery reproductive and migratory success.

- The PAD states: "Fish passage (upstream and downstream) for migratory fish species has existed at Cape Horn Dam (Van Arsdale pool-and-weir ladder) since 1909, with modifications of the ladder to improve fish passage in 1915, 1962, 1987, and, most recently, experimental improvements for Pacific lamprey passage (2014- 16)".
  - This record strongly suggests that fish passage over Cape Horn Dam has been suboptimal. It is not clear that the fish ladder, fish screens, as improved as they appear to be from previous installations, are in fact capable of or likely to allow fish passage sufficient to support recovery of Eel River salmonids and other native fishes. The evidence appears to indicate that lower flows than required under the RPA will result in a failure of chinook migration up the ladder; it also appears to indicate that high flows keep the fish screens from properly functioning to divert fish into the ladder going downstream.
  - We request additional information and an analysis in the EIS to explain the effectiveness of fish passage at Cape Horn Dam.
- The PAD states: "Migratory Pacific lamprey are common in the vicinity of the Project

Substantial Chinook salmon and steelhead spawning habitat also exists in two large tributaries to the Eel River within the study area (Tomki Creek and Outlet Creek), and steelhead spawning habitat exists in numerous smaller tributaries to the Eel River that are unaffected by the Project."

  - We request additional information and an analysis in the EIS to address the apparent collapse of salmon production in Tomki Creek, and to what extent the apparent success of RPA flows in facilitating chinook passage over Cape Horn during most years provides an explanation for the failure of chinook to exploit Tomki's available habitat.

- The PAD states: *This screen was replaced with a pair of inclined plane screens in 1995 to better protect downstream migrant fish and improve operational reliability.*
  - We request additional information and an analysis in the EIS to explain how effective the screens are, especially in their present condition, and whether improved screens might provide better performance.
- The PAD states: "the Eel River provides suitable summer rearing habitat in most years only as far downstream as Thomas Creek, 8 miles below the reservoir."
  - We request additional information and an analysis as to what habitat young steelhead might expect to be able to use in the Project area, and in areas now inaccessible because of the Project, if the Project were not in place. Again, the evidence strongly suggests that most of the best potential rearing habitat in the upper Eel River lies behind Scott Dam.
- The PAD states: "Since the introduction of Sacramento pikeminnow to the Eel River watershed (presumably in Lake Pillsbury) around 1979, this species has spread throughout most of the watershed and has established large populations. Their proliferation and the resulting competition with, and predation on, native fish species has greatly affected overall fish population levels and is viewed as a major obstacle to the recovery of anadromous salmonids in the Eel River Watershed."
  - We note that the RPA required measures to address pikeminnow predation, but those

measures have proved difficult or impossible to implement. We request additional information and an analysis in the EIS to consider and explain what measures might realistically be taken to reduce the impact of pikeminnow on Eel River fisheries, particularly young salmon and steelhead. Because the pikeminnow population in the Eel River appears to be a consequence of the Project and its operations, mitigating its presence should be a requirement of any license which may be issued in the future.

Fish Passage Barriers

Scott Dam

- The PAD states: "Construction of Scott Dam created a 130-foot-high upstream migration barrier to fish passage. No upstream fish passage facilities exist at the dam. The amount of riverine habitat upstream of Scott Dam inaccessible to anadromous salmonids (spawning and rearing) and the estimated potential numbers of returning fish in this area differ significantly based on various reports."
    - We request additional information and an analysis that explains how fish passage could be constructed in order to make this structure passable for salmonids.

Cape Horn Dam

- The PAD states: "CDFW personnel have noted that when ladder flow drops below 9.8 cfs, a migration barrier is created at the submerged orifice of the uppermost ladder pool. Maintaining ladder flows above 9.8 cfs or installing restrictor baffles at each orifice alleviates this problem. Flows in excess of 10.5 cfs can create overflow problems in the fish house at the entrance to the ladder, especially when debris loads are high."
    - It appears that there may be only a fairly narrow window of flows in which the Van Arsdale fish ladder operates properly. We request additional information and an analysis in the EIS to clarify how such flows are to be maintained.
    - The EIS should also explain what impacts on fisheries may result from high debris loads which impair operation of the fish screens. This question does not appear to be addressed in the PAD, but such impacts could contribute to the cumulative impacts on fisheries and aquatic ecosystems which the EIS must address.

- The PAD states: "The current RPA minimum flows are intended to allow for adequate passage flows at the critical riffle above Garcia Creek. During the December to March period, the minimum RPA flow from Cape Horn Dam has a floor of 100 cfs and a cap of 140 cfs; however, the floor can drop to 25 cfs when there are exceptionally low inflows to Lake Pillsbury (NMFS 2002)."
    - When flows were reduced in December 2012, chinook upmigration at Cape Horn essentially ceased (one more fish came up the fish ladder). We request additional information and an analysis in the EIS to consider the impacts, including cumulative impacts, on fisheries reproduction associated with flows which dramatically reduce effective fish passage.

Instream Flow

- The PAD states: "Instream flows include minimum flows and block water (block water is a volume of water used by fisheries agencies adaptively to enhance aquatic habitat)."
    - We want to highlight the importance of the Endangered Species Act in protecting against flows too inconsequential to support salmonids in the Eel River. The flows outlined in the RPA have been insufficient to slow the decline of salmonids in the Eel River, and we request additional information and an analysis on how flows will be governed under the new license in order to protect salmonids.

Block Water

- The PAD states: "Block water for release at the discretion of CDFW to directly benefit salmon and steelhead was originally made available through the 1983 FERC Project license. Such releases were made on 17 occasions between 1985 and 1996."
    - In the 11 years between 1985 and 1996, there were 17 blockwater releases. We request additional information and an analysis in the EIS to document the timing, magnitude, and circumstances of those releases.
- The PAD states: "In 2004, NMFS and CDFW developed block water release procedures to expedite responses and implementation of releases. As specified by these procedures, any stakeholder (including NMFS and CDFW) can contact either NMFS or CDFW to

request the release of block water. NMFS and CDFW jointly make the final decision regarding block water releases and then contact PG&E to order such releases. In 2012, NMFS and CDFW developed block water guidelines intended to help determine when block water releases would benefit salmon and steelhead in the Eel River. The first "block water" release under the 2002 RPA occurred in May 2012."

- We request additional information and an analysis in the EIS that thoroughly documents and assesses the use, disuse, and effectiveness of blockwater releases as an element of the license's mitigation strategies and techniques.
- Further, we request additional information and an analysis of the method of decision making on blockwater release timing and effectiveness. We also request additional information on benefits to PGE and downstream consumptive users from the unused blockwater; what the consequences may have been of reducing blockwater volumes from 5000 af under the previous license to 2500 af under the RPA amendment, and whether 2500 af is an adequate reserve of blockwater.
- We request additional information and an analysis of how PVP infrastructure constrains the timing, composition, and effectiveness of blockwater releases.

The PAD describes a May 2012 blockwater release. It notes that, per Butler 2012, that while the "(r)elease encouraged Chinook salmon emigration, (it) did not encourage movement of young-of-year steelhead." We request additional information and an analysis on how might the blockwater releases or flow schedule or Project operations in general be better managed to effectively encourage the downstream movement of young of the year steelhead.

The PAD also notes that "the release encouraged adult lamprey to migrate upstream." Elsewhere, the PAD suggests that lamprey migrate throughout the year and are common in the Project area. At the time, however, the surge of lamprey up the Van Arsdale fish ladder was an unforeseen event.

The EIS should provide as much detailed information as is available about the relationships, if any, between downstream flows at Cape Horn Dam, through the Van Arsdale fish ladder, and lamprey migration. The EIS should consider whether additional releases

should be scheduled and maintained to maximize lamprey migration above Cape Horn Dam.

The PAD describes the attempted blockwater release in 2013, which failed because there wasn't enough water in Lake Pillsbury. The EIS should document the circumstances, both operational and hydrologic, which made it impossible to use either 2500 af of blockwater or maintain reduced flows from the surface of Lake Pillsbury.

- The PAD describes the 2014 release: "In the spring of 2014, NMFS and CDFW again requested the release of warmer surface waters from Lake Pillsbury to stimulate the timely downstream migration of juvenile Chinook salmon. From April 30 to May 29, PG&E incorporated surface releases into the total release at Scott Dam at varying percentages to achieve target temperatures of about 15°C. A significant increase in emigration of juvenile Chinook salmon and steelhead was achieved during these releases."
    - We request additional information and an analysis in the EIS in order to consider how such releases could be conducted as a matter of routine. It should assess whether such results or better ones could be achieved, by what means, and at what cost. It should clarify what "significant increase" means here, and particularly whether the actual emigration achieved would be sufficient to support recovery of both steelhead and chinook populations. It should also consider what measures might be taken but have not yet been.
    - The PAD suggests what is apparent, that there is always some tension in decisions about use of the limited amount of blockwater available. When blockwater releases are made in the late summer and fall, as they were in 2014, that means that water was not used to promote emigration in the preceding spring. The EIS should consider whether the current blockwater rules make sense in view of the apparent need for supplemental flows during both seasons, especially in the low-water years when fish are already suffering severe cumulative impacts.

The PAD does not note, however, that the 2014 fall releases also had effects far beyond the Project area. When that pulse reached the mouth of the Eel, the reach which had

disconnected in late August finally reconnected. This fact alone strongly suggests that the effects of Project operations can and do affect the entire Eel to its mouth.

The EIS should also discuss 2015 and 2016 blockwater releases, as well as any additional releases which may occur prior to the release of the DEIS.

During low reservoir levels at Lake Pillsbury, the only releases through Scott Dam facilities are through the needle valve, located in the cold water strata of the Lake Pillsbury reservoir. There is currently no means or methods for PGE to release warmer water from the Lake Pillsbury reservoir.

During 2016 conversations in the Potter Valley Drought Working Group with staff and participants, PG&E staff acknowledged that there are no on-site pumps, no generators, no plans and no means to discharge any water from Lake Pillsbury other than through the needle valve.

If the needle valve is stuck, clogged or otherwise inoperable, there is no way to comply with RPA mandated minimum flows to E-2, E-11 or E-16, for Fall in-migration "Pulse Flow" releases, for Block Water releases, or for releases to the generating facilities or to PVID or anything in the EBRR.

PGE staff has proposed "studying the issues and coming back within 2 years with a plan to address the issues." We request additional information and an analysis of the proposed plan.

5.3.4.2 Riverine Aquatic Community

Algae

We request additional information and an analysis in the EIS to consider whether Project removal or reconfiguration would reduce the current and future frequency and severity of cyanobacteria blooms in the Eel.

Benthic Macroinvertebrates

- The PAD states: "Benthic macroinvertebrate (BMI) sampling has not been historically conducted in the Eel River between Scott Dam and the confluence with the Middle Fork Eel River."

- Alison O'Dowd of Humboldt State University has conducted BMI sampling in the mainstem Eel near Hearst.[48]
- We request additional information and an analysis in the EIS on Project related effects on BMI communities in the Eel River. It should provide some accounting of BMI community structure above, between, and below the dams and reservoirs, and compare conditions in the Upper Eel River below the dams to unimpaired similar reaches of the river. It should provide an analysis of relationships between flows and BMI productivity and health. It should also sample BMIs for key toxins, especially mercury.

Aquatic Mollusks

- The PAD states: "The Eel River in the vicinity of the Project is within the historic range of the Western pearlshell mussel, Margaritifera falcata, and the California Floater, Anodonta californiensis (Howard et al. 2015a). Both species are believed to be extant in the greater Eel Watershed (Howard et al. 2015a), but focused surveys for native mussels have not been conducted in the Project vicinity."
  - We request that the EIS analyze and disclose, and incorporate into relevant analyses, samples of mollusks in the project area for mercury and other pollutants.
  - The EIS must also analyze the risk of impacts associated with nonnative mollusks. It should detail current and potential measures for mitigating those harms by preventing the introduction and/or reproduction and dispersal of nonnative mollusks.

Fish Community

- The PAD states: "Nine native and six non-native fish species are present or potentially present in the Eel River within the Study Area. Table 5.3-2 lists the fish species that have

[48] See O'Dowd, A., and W. Trush, 2016, FOER Blockwater Investigation Final Memo, p 25 and following, available at https://drive.google.com/open?id=0B8LzWutg0vukUW1CVkU2NHA4SVU.

been reported as potentially occurring in these river sections."

- Table 5.3-2 does not list any fish above Scott Dam or Lake Pillsbury. We request that the EIS must include analysis of fish populations above Lake Pillsbury.
- Rainbow trout above Scott Dam may be very important to protection of the public trust resource in viable native salmonid species, in that the upriver population of rainbow trout may retain the premature migration gene which is the essential difference between winter steelhead (which still survive in low numbers in the upper Eel) and summer steelhead (which have been extirpated from the upper Eel, but still survive in small populations in the Middle Fork Eel and Van Duzen River tributaries of the Eel River). Additionally, rainbow trout serve as effective proxies for the habitat needs of their sea-run steelhead brethren.

Steelhead

The PAD mentions summer steelhead at p 5-44, but fails to present any information about summer steelhead, their apparent extirpation from the Project area, or their habitat requirements in this section.

The best available science now strongly indicates that summer steelhead in the Eel River, like spring chinook where they survive, should be considered and protected as distinct genetic entities under the federal Endangered Species Act. (Miller, in press 2017).

The last license issued for the Project had to be amended at considerable expense and trouble, and with substantial consequences for Project operations, power production and consumptive water use, after it was approved without adequate protections for species which shortly thereafter were listed under the ESA. FERC should seek to avoid such an outcome here by preparing, in the EIS, the level of analysis of summer steelhead and mitigation measures appropriate to the recovery of a critically endangered species.

The EIS should consider whether native rainbow trout above Lake Pillsbury, which are landlocked *O. mykiss*, include individuals with the vital premature migration gene. Because the rainbows have not migrated to the ocean for a century, the premature migration gene that determines the summer steelhead migration strategy and body type will not have been selected

out, as appears may have happened to steelhead below the Project.

- The PAD states: *Key information related to steelhead in the Study Area include the following: Adult steelhead numbers have declined since the 1960s.*
    - The PAD here is referring to steelhead counts at Cape Horn dam. We request additional information and an analysis in the EIS as to these numbers compare with other available data about steelhead populations in the Eel and across the region.
- The PAD states: "Spawning and rearing (e.g., over summer) exists both in the Eel River and tributaries downstream of Lake Pillsbury."
    - The question at hand is not so much what habitat exists now, but what its quality and overall utility is – ultimately, whether it is adequate to provide for recovery of the species (again, both summer and winter steelhead). We request additional information and an analysis of more than just the immediate Project area, as it will not be possible to support a recovered Eel River steelhead population in the Project area alone.
- The PAD states: "The density of rearing steelhead in the Eel River decreases with increasing distance and associated warm water temperatures downstream of Van Arsdale Reservoir."
    - We request additional information and an analysis in the EIS of whether rearing steelhead actually survive to make it to the ocean, in what condition, and how many of them survive to return as adults. As noted previously, the EIS should analyze the net utility of Project operations for Eel River fisheries, and consider whether decommissioning would not result in considerably more, and more effective habitat, becoming available than under the most comprehensive possible suite of Project mitigations.
- The PAD states: "Introduced Sacramento pikeminnow densities have been high since the 1980s and are highest in the river below Van Arsdale Reservoir, where water temperatures are more suitable for this species. However, they occur in and above Van

Arsdale Reservoir, at population levels that may interfere with salmonid production. Their proliferation and competition with, and predation on, native fish species is viewed as a major obstacle to the recovery of anadromous salmonids in the Eel River Watershed."

  - We request additional information and an analysis in the EIS to consider what, if any, potential measures might effectively reduce pikeminnow impacts on salmonids and other aquatic life in the Eel River.

- The PAD states: "Annual adult steelhead counts at VAFS since 1922 were frequently above 3,000 to 4,000 fish prior to approximately 1960 (Figure 5.3-9 and Table 5.3-3). Since 1960, steelhead counts have typically been less than 1,000 to 2,000 fish and, in many years, less than 500 fish."
  - We request additional information and an analysis in the EIS of what the depensation level would be for this population, given the observed impacts of pikeminnow predation and delayed outmigration. This would help determine if there are other thresholds of concern as the population declines in size which the EIS should address.
- The PAD states: "Many factors have no doubt contributed to the observed declines in fish numbers at VAFS and elsewhere in the watershed, including logging, road construction, livestock grazing, agriculture (both legal and illegal), introduction of invasive species, natural flood events, and poor ocean conditions."
  - We request additional information and an analysis in the EIS which reflects the best available information regarding the complex of limiting factors relevant to salmonid reproduction and recovery in the Eel River.
- The PAD states: "In the late 1990s, a spike in numbers occurred, with counts in 3 successive years ranging from approximately 2,400 to 7,700 fish; however, the spike was heavily influenced by hatchery fish. Since 2008, steelhead counts have ranged from 166 to 935 fish, with only one hatchery fish present in the counts."
  - The literature indicates that domestication effects can take place within even a

single generation of hatchery fish. We request additional information and an analysis in the EIS that reflects any available information about the continued influence, if any, of hatchery operations on Eel River steelhead.

- The PAD states: "The 'collapse' of the steelhead (and Chinook salmon) returns beginning in 1989 (during the ten-year monitoring study) was related to poor ocean conditions that affected salmonids on the West Coast (SEC 1998). Other high and low cycles in the data set are, in part, a product of cycles in ocean productivity."
    - Both good and poor ocean conditions have occurred in the historical record; salmonid numbers did not collapse in previous periods of poor ocean conditions to near-extinction. We request additional information and an analysis in the EIS on the consequences for Eel River steelhead when ocean conditions become poor again.
    - There is evidence that the Pacific Ocean's patterns and chemistry have been changing in ways that suggest deleterious consequences for West Coast salmonids now and in the future. The evidence also suggests that climate change can create additional challenges for Eel River salmonids, bringing both drought to their freshwater habitat and poor feeding conditions to their ocean habitat. Warming temperatures, and especially a persistent pool of anomalously warm water termed "the Blob" in the NE Pacific, appear linked to the intense drought patterns that affected California and the Southwest over the 2012-2015 period.
    - We request additional information and an analysis in the EIS as to the level of impairment in ocean productivity that would make it impossible to restore Eel River salmonids to viable population numbers.
- The PAD states: "A decline in juvenile steelhead beginning in the early 1980s and a rapid increase in Sacramento pikeminnow from the early 1980s to apparently quasi-steady numbers in recent years is indicated in the historical sampling data ... Recent juvenile steelhead sampling data from 2005 to present at seven quantitative sampling sites below Cape Horn Dam (Table 5.3-7) and three qualitative sampling sites above Cape Horn Dam

(Figure 5.3-12) show that summer rearing occurs in the Eel River from Scott Dam to several miles downstream of Van Arsdale Reservoir, with numbers decreasing with increasing distance downstream of the reservoir. The Thomas Creek site, located 8 miles below Van Arsdale Reservoir, is the farthest downstream monitoring site on the Eel River with consistent steelhead presence each year. Pikeminnow numbers (Table 5.3-7) are high at all of the sites downstream of Cape Horn Dam."

  - We request additional information and an analysis in the EIS of pikeminnow predation.

- The PAD states: "The decreasing density of juvenile steelhead with distance downstream of Cape Horn Dam is consistent with the pattern of increasing water temperature (see Section 5.2 –Water Quality, Figure 5.2-1). Kubicek (1977) classified the Eel River between Cape Horn Dam and Tomki Creek as thermally marginal and the lower river as thermally lethal. At the farthest downstream sites, in spite of the very high temperatures, low numbers of juvenile steelhead are present in some years. Small localized areas with suitable temperatures can persist in the Eel River at the downstream sites due to cool water thermal refugia created by bank seeps, hyporheic flow upwelling, cold water inflows, and stratified pools in the vicinity of cool water inflows (e.g., Kubicek 1977; Beak 1986)."
  - We request additional information and an analysis in the EIS on the extent to which such refugia might be usable by summer steelhead moving up to the upper basin.
- The PAD states: "*Downstream migration of juvenile steelhead past Cape Horn Dam varies widely within and between years."*
  - We request additional information and an analysis in the EIS should analyze available data to discover what the optimal migration patterns may be, and consider mitigation measures which may better assist steelhead to achieve those patterns.

Chinook Salmon

We request additional information and an analysis in the EIS as to what accounts for the continued collapse of Tomki Creek chinook populations. This is crucial to determining the extent to which the Project can or should be modified, operated, or decommissioned in order to insure the survival and recovery of Eel River salmonids.

The EIS should attempt to account for the relative improvement in chinook numbers noted previous to the recent drought. Similarly, it should provide an up-to-date accounting of how chinook populations in the upper mainstem Eel have responded to the very significant impacts related to the drought, and compare those impacts to chinook in the South Fork Eel and other watersheds populated by the California Coastal Chinook ESU.

Non-Salmonid Native Species

Green sturgeon are unlikely to have existed in the Project area, but they certainly would have benefitted from larger populations of spawning salmon and lamprey. Recent surveys by the Wiyot Tribe should be reflected in the EIS. The EIS should treat green sturgeon as a species likely to become listed in the near future.

Pacific lamprey are a keystone species in steep decline across the Pacific coast. They have also been the subject of a petition under the Endangered Species Act, at the same time as the green sturgeon petition noted above. While UFSWS declined to list lamprey at that time, the best available scientific information suggests that the species continues to decline and is likely to be listed if current trends continue. Thus, the EIS should also treat lamprey as a species likely to be listed in the near future, and certainly within any license period.

We request additional information and an analysis in the EIS as to how the presence and operation of the Project result in impacts to lamprey and modifications to the license, reflecting what mitigation measures, might be most effective in providing for lamprey recovery. A key question is whether the Eel River is now a source or a sink for lamprey production.

5.3.5.4 Fish Stocking

We request additional information and an analysis in the EIS of introduced stocked rainbow interbreeding with native rainbow above Lake Pillsbury. The EIS should document

whether triploid rainbow trout are now exclusively stocked in Lake Pillsbury, and if so, how long this practice has been in effect. If there is significant potential for the stocked rainbow to reduce the potential genetic fitness of native rainbows, the EIS must consider eliminating the stocking program.

5.3.8.1 Steelhead

- The PAD states: "Steelhead in the upper Eel River are considered part of the Northern California Coast (NC) Distinct Population Segment (DPS) and are listed as Threatened under the ESA (NMFS 2016). Steelhead in the Study Area are considered part of the Lower Interior Diversity Stratum, which includes populations spawning in tributaries between Dos Rios and Scott Dam. Upstream of Scott Dam, steelhead are part of the North Mountain Interior Diversity Stratum, which includes the Upper Mainstem Eel River population (NMFS 2016). The Eel River downstream of Cape Horn Dam, including the large tributaries in the Project Area, Tomki Creek and Outlet Creek, are designated as Critical Habitat for NC DPS steelhead (Federal Register, Sept. 2, 2005 [70 FR 52488 – 52627])."
    - As previously noted, the best available scientific information now indicates that summer and winter steelhead should be listed as distinct entities under the federal Endangered Species Act (ESA).[49] While the two are lumped together now, and listed as an ESU with Threatened status, there is little question that when summer steelhead are recognized as a distinct species for the purposes of the law, the Eel River population must be considered Endangered.
    - A recent assessment of California salmonids by Moyle et al, and CalTrout recognizes Northern California summer steelhead as distinct from winter steelhead

[49] See Prince, et al. 2017.

in the same streams.[50] The assessment states that "(r)ecent studies found that NC winter and summer steelhead are distinct from one another. NC summer steelhead are more closely related to NC winter steelhead than they are to summer steelhead from other regions in California. NC summer steelhead have a genetic variation similar to spring-run Chinook salmon that influences run-timing to fresh water, which allows them to access higher elevation and smaller tributaries for spawning."[51]

- The assessment notes that "(t)he Eel River, which once supported the largest run of NC summer steelhead, has had decreasing adult returns over the last fifty years." It describes the "level of concern" for North Coast summer steelhead as "critical," and cites "major dams" as the first of the three greatest anthropogenic threats to the species. It also notes that these fish are "critically susceptible to climate change." By contrast, winter steelhead in Northern California are assessed as having only a moderate level of concern, although major dams are still listed first among anthropogenic threats.[52]
- Current expert opinion strongly suggests that the upper mainstem Eel River above Lake Pillsbury would provide spawning and rearing habitat critically needed by summer steelhead to re-establish a third viable population in the Eel River watershed. The CalTrout report notes that "Scott Dam on the upper mainstem Eel River blocks access to an estimated 463 km (285 mi.) of potential spawning, migration, and nursery habitat" for summer steelhead.[53]
- Thus, the EIS should carefully consider not only Project-related impacts on

---

[50] Moyle, P., Lusardi, R., Samuel, P., and J. Katz. 2017. *State of the Salmonids: Status of California's Emblematic Fishes, 2017. 555pp. San Francisco, CA.*

[51] Id.

[52] Id.

[53] See Emily Cooper, *An Estimation of Potential Salmonid Habitat Capacity in the Upper Mainstem Eel River, California*. Masters thesis, Humboldt State University, May 2017.

steelhead, but specifically how all impacts, including cumulative impacts, may weigh on the survival and recovery of summer steelhead.

5.5 Wildlife Resources

Wildlife, including mammals and birds as well as arthropods, may be affected by mercury contamination originating from the Lake Pillsbury reservoir. The propensity of methylmercury to bioaccumulate means that biologically significant amounts may be ingested both by creatures which prey directly on fish affected by mercury accumulation, and by those which don't necessarily appear linked to mercury sources in the environment. For example, high levels of mercury have been found in birds which prey on spiders that bioaccumulate mercury from their prey.

The severe and lasting effects of mercury on reproduction, development, and survival of wildlife and birds are well-documented.[54]

Because the Project and its operations appear to be at a minimum an important source of methylated mercury in the Project areas, the potential impacts of mercury burdens in wildlife, including birds, should be considered among the Project's indirect and cumulative impacts. We request additional information and an analysis in the EIS of the potential impacts of mercury accumulation on listed and sensitive species and it should also assess the potential for mercury to be passed on to human consumers of game species in the Project vicinity. In order to understand the distribution of mercury in the food web, we need information about burdens at various trophic levels, but especially at the highest levels.

Thus, the EIS should consider, analyze, and disclose the mercury burden in representative samples of wildlife, including arthropods and birds, as well as fish, including ammocoetes, mollusks, and benthic macroinvertebrates in the project area. Thus, study AQ-3, found at 6.2.1.3 in the PAD, should be modified to include additional aquatic components, and additional studies

---

[54] See Wolfe, M.F., Schwarzbach, S., and R.A. Sulaiman, 1998. Effects of Mercury on Wildlife: A Comprehensive Review. Environmental Toxicology and Chemistry, Vol. 17, No. 2, pp 146-160.

should be undertaken to provide useful estimates of mercury impacts on wildlife. Live trapping of arthropods, rodents and smaller birds in the immediate Project vicinity might be complemented by obtaining hair samples from larger animals, and feathers and scat from larger birds.[55]

5.9 Recreation Resources

Existing On-Site Amenities

Although Table 5.9-2 provides a list of all Potter Valley Project Recreation Facilities, there is no clear picture of what kind of amenities are available at each of these sites. The PAD does not provide an amenities inventory for each recreational facility that details the following:

- Number of tent campsites
- Number of full RV hook-up campsites
- Number of partial RV hook-up campsites
- Existence of Boat Launch Facility
- Existence of Individual and Group Picnic Areas
- Number of Restrooms and Showers
- Number of auto parking spaces
- Number of auto & trailer parking spaces
- Identify all concessionaire located on facility (i.e. full-service marina, houseboat dock, camp store or snack shack)

Missing Whitewater Boating Resources on the Eel River

California Creeks Whitewater Boating Web Guide (Tuthill et al. 2016) is an excellent resource that the Conservation Groups would recommend. However, it does not detail all the available runs potentially impacted by the project. Below is a list of 3 runs not included in Table 5.9-1. This information was found in *The New School Guide to Northern California Whitewater*

---

[55] See Duffy, L.K., Duffy, R.S., Finstad, G., and C. Gerlach. 2005. A note on mercury levels in the hair of Alaskan reindeer. Science of the Total Environment 339, p 273-276.

by Dan Menten, *The Best Whitewater in California the Guide to 180 Runs* by Lars Holbeck and Chuck Stanley and the *National River Database* maintained by American Whitewater.

Run Name	Put In	Take Out(s)	Gradient	Approx Length (miles)	Duration (days)	Overalll Rating	Boatable Flow Range
Eel River above Pilsbury Reservoir (Upper Main Eel)	Mt Road Bridge	Sunset Campground	82 average	15 (+6 miles on lake)	1	IV 600 to 1200, V 1200+	500 - 1500 kayaks
Van Arsdale to Hearst	Van Arsdale	Hearst	40 fpm	11.4 miles	2 to 3	II 600-2000, II-III 2000+	600 - 7000 cfs
Hearst	Hearst	Highway 162 bridge over the Eel	19 average	19 miles	2 to 3	II 600-2000, II-III 2000+	500 - 8000 cfs

State and National Wild & Scenic Designation

See our comments for Section 3.3.1.

6.2.5 Recreation Resources

The Conservation Groups provide comment on recreation resources studies below. Actual study requests will be made in the Study Proposal section of this document.

An economic analysis included in the AQ1 Hydrology and Project Operations Modeling study would augment and inform recreational resource studies.

Though PG&E proposed no potential studies of Hydrology and Project Operations Modeling, the Conservation Groups recommend an operations model that would be able to compute power generation at the Potter Valley Powerhouse resulting from Project operations. The model should include the capability of reflecting operations to shape power generation to meet energy demands. If needed, post-processing of daily model output could be developed to simulate hourly operations of the powerhouse to simulate inter-day variations in releases from the powerhouse. This post-processor would need to be able to produce outputs in revenue as well as generation. Revenue projections should be based on the most current pricing data available. The outputs need to include standard generation, as well as any ancillary services provided by the project.

Note that the water balance/operations model runs on a daily time step and cannot directly simulate shorter time period power operations. So, to simulate the range, rate of change

and occurrence of flows within a day, post-processing of the water balance/operations model output can be accomplished using Excel spreadsheets to apply hourly or 15 minute patterns to the daily flows for a representative period of interest.

Overall, PG&E should collaborate with Relicensing Participants on the more variable, discretionary elements of project operations, model output and additional post-processing needs for refined analysis and information.

6.2.5.1 Study REC 1 – Recreation Facility Assessment & 6.2.5.2 Study REC 2 – Reservoir Recreation Opportunities.

Combine a study for Recreation Facility Assessment & Reservoir Recreation Opportunities

Conservation Groups believe the proposed analyses for facilities and the existing information on reservoir recreation falls short of capturing current user experience specific to each project facility. We therefore propose a combined study that will inventory existing amenities and conditions at each facility (see 5.9 comments) and require a user survey to be administered during the height of the recreation seasons for each facility.

FERC regulations require that the licensee include a description of the existing recreation measures or facilities to be continued and maintained during the term of the new license, propose new measures or facilities, as appropriate, to enhancing recreational opportunities at the Project, and identify public safety in the use of Project lands and waters. In addition, recreation is a recognized project purpose at FERC-licensed projects under Section 10(a) of the Federal Power Act.

6.2.5.3 Study REC 3 – Whitewater Boating Flow Assessment

Conservation Groups disagree with the PAD assessment that existing information is sufficient to close the information gap regarding whitewater boating. We request additional information and an analysis in the EIS of potential effects of relicensing on whitewater boating on the Eel and Russian Rivers.

Existing descriptions of whitewater resources do not capture current user experience on river runs potentially affected by the Project.

While available whitewater descriptions can identify ideal times, flow and access points, they cannot measure project impacts to the whitewater boating experience. A whitewater boating study that includes a stakeholder survey and focus group would provide recreational user preferences and evaluation of existing facilities, available flows and access points under current project operations.

***Average daily flow data does not provide accurate information on historic recreational flows and are not sufficient to properly assess boating flow opportunities*.**

Existing gauging data from USGS E2 11470500 downstream of Scot's Dam and E11 11471500 downstream of Cape Horn Dam is reported in daily averages. However, whitewater boating is reliant on real-time information either in 15 minute increments or hourly data. For instance, on the Class III-IV Pillsbury Run below Scott Dam the minimum flow required for a raft is 500 cfs. (See PAD Table 5.9-1) At any lower flows, paddlers in a raft could either find themselves stranded on the river or without the flows needed to safely navigate the rapids. Yet in the table example below, flows during the day from 11 am to 5 pm could drop out of rafting range and still report out a daily average of 625 cfs. This would give the false impression that a boating opportunity was available during daylight hours.

Example Flows on Pilsbury

1:00 AM	800	
2:00 AM	800	
3:00 AM	800	
4:00 AM	800	
5:00 AM	800	
6:00 AM	800	
7:00 AM	800	
8:00 AM	800	
9:00 AM	800	
10:00 AM	800	
11:00 AM	200	Out of Boating Range for Rafts
12:00 PM	200	
1:00 PM	200	
2:00 PM	200	
3:00 PM	200	
4:00 PM	200	
5:00 PM	200	
6:00 PM	800	
7:00 PM	800	
8:00 PM	800	
9:00 PM	800	
10:00 PM	800	
11:00 PM	800	
12:00 AM	800	
Daily Average	625	

Based on this scenario, we request additional information and an analysis in the EIS of real-time data to properly identify project impacts to whitewater boating on the Eel River.

A Hydrographic Analysis of Spills could identify recreational flow opportunities within a natural hydrograph that are mutually beneficial to Species of Concern and Native Aquatic Species.

Since the management of naturally occurring spills within a natural hydrograph regime could provide opportunity for whitewater recreational flows and benefit species of concern as well as native aquatic species, the Conservation Groups recommend a Hydrographic Analysis of Spills that incorporates the following components:

- Historic 15-minute or hourly gauge information from PG&E loading the data to DSSVue for visualization and analysis using the US Army Corps of Engineers DSSVue software.
- Corresponding daily flow data for USGS records in DSSVue format.

- Characterize historic spill characteristics for spills more than 1000 cfs from 15-minute or hourly hydrological data including plots, identification of magnitude, timing, duration, recession rate, and possible multiple peak flows by year and water year-type
- Characterize Pillsbury lake levels, inflows into Pillsbury Lake, the Van Arsdale Diversion Intake and Potter Valley Powerhouse.
- Summarize PG&E's contractual agreements for flows for Potter Valley Irrigation District.
- Summarize existing infrastructure capabilities for controlling spills.
- Prepare a report that includes methods and findings with annual plot illustrating showing multiple spills by water year; tabulations and plots of spill recessions, as well as inflows to and outflows from Pillsbury Lake during spills. The memo should identify the constraints to operation, capacity and the ability to control spills.

Overall, spill cessation has been or is currently being addressed on other FERC hydroelectric projects including the Upper Drum-Spaulding Project 2310, the Yuba-Bear Project 2266 and the Big Creek 4 Project 2017. This analysis can either be addressed in AQ 10 – Special Status Amphibians and Aquatic Reptiles or within a proposed Whitewater Boating Study to be detailed in the study proposal section.

STUDY REQUESTS

The Conservation Groups join in the information and study requests submitted by the resource agencies, and also submit the following additional study requests, attached hereto as Appendix A and incorporated herein by reference:

1. Development of Decision Support Tools to Evaluate Potter Valley Project Decommissioning Alternatives
2. Quantification of Impacts of Reduced Diversions through the PVP on Regional Electrical Power Supply and Downstream Water Supply
3. Effects of Climate Change on Hydrology and Stream Temperatures in the Mainstem Eel River Basin
4. Recreation Facilities Assessment and Recreation Opportunities Study
5. Whitewater Boating Study
6. Investigation of Sediment Contamination and Bioaccumulation of Hazardous and Toxic Constituents in Aquatic Organisms
7. Assessment of Anadromous Fishery Potential Upstream of the Potter Valley Project

BIBLIOGRAPHY

Asarian, J.E.; Higgins, P.; and Trichilo P., *Stream Temperatures in the Eel River Basin 1980-2015, Phase 1: Compilation and Preliminary Analysis* (2016) available at http://www.eelriverrecovery.org/documents/EelTemps_Final_20160417.pdf

Asarian, J.E. and Walker, J., *Long-Term Trends in Streamflow and Precipitation in Northwest California and Southwest Oregon,* 1953-2012 Journal of the American Water Resources Association (JAWRA) 52: 241-261. DOI: 10.1111/1752-1688.12381(2016)

Asarian, J.E., *Long-Term Streamflow and Precipitation Trends in the Eel River Basin* (2015) available at https://eelriver.org/wp-content/uploads/2016/08/Streamflow-and-Precipitation-Trends.pdf

Asarian, E., *Assessment of altered hydrologic function, dams, and diversions within the Southern Oregon/Northern California Coast evolutionarily significant unit of coho salmon* (2015) available at https://archive.org/details/soncc_hydrologic_report_20151002_revised

Bellmore, J.R.; Duda, J.J.; Craig, L.S.; Greene, S.L.; Torgersen, C. E.; Mathias, J.C.; and Vittum, K., *Status and trends of dam removal research in the United States* (2016) *WIREs Water* . doi: 10.1002/wat2.1164

Bettaso, J. and Goodman, D.H., *Mercury contamination in two long-lived filter feeders in the Trinity River basin: a pilot project.* U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata Fisheries Technical Report Number TR2008-09 (2008)

California Department of Fish and Wildlife. *Recovery strategy for California Coho salmon: report to the California Fish and Game Commission, Species Recovery Strategy 2004-1.*

California Department of Fish and Wildlife, Native Anadromous Fish and Watershed Branch. Sacramento, CA (2004)

California Department of Fish and Wildlife, *Critical Riffle Analysis for Fish Passage in California. California Department of Fish and Wildlife – Instream Flow Program* (2015)

Chan, H.M.; Scheuhammer, A.M.; Ferran, A., Loupelle, C.; Holloway, J.; and Weech, S. *Impacts of Mercury on Freshwater Fish-Eating Wildlife and Humans,* Human and Ecological Risk Assessment: An International Journal (2003) available at http://dx.doi.org/10.1080/713610013

Cizdziel, J.V., and Gerstenberger, S., *Determination of total mercury in human hair and animal fur by combustion atomic absorption spectrometry,* Talanta (April 13, 2004)

Cooper, E., *An Estimation of Potential Salmonid Habitat Capacity in the Upper Mainstem Eel River, California*. Masters thesis, Humboldt State University (May 2017)

Deemer, B.R.; Harrison, J.A.; Li, S.; Beaulieu, J.J.; DelSontro,T.; Barros N.; Bezerra-Neto, J. F.; Powers, S.M.; dos Santos, M.A.; and Vonk, J.A., *Greenhouse Gas Emissions from Reservoir Water Surfaces: A New Global Synthesis* (October 5, 2016)

Davis, J.A.; Melwani, A.R. ; Bezalel, S.N.; Hunt, J.A.; Ichikawa, G.; Bonnema, A.; Heim, W.A.; Crane, D.; Swenson, S.; Lamerdin, C.; and Stephenson, M., *Contaminants in Fish from California Lakes and Reservoirs, 2007-2008: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP)*, California State Water Resources Control Board, (2010)

Duffy, L. K.; Duffy, R. S.; Finstad, G.; and Gerlach, C., *A note on mercury levels in the hair of Alaskan reindeer,* Science of the Total Environment 339, p 273-276. (December 1, 2004)

Eel River Forum, *The Eel River Action Plan, Final Report* (May 2016) available at http://caltrout.org/wpfb-file/eel-river-action-plan-2016-pdf/

Federal Energy Regulatory Commission ("FERC"), *Preparing Environmental Documents* (2008) available at https://www.ferc.gov/industries/hydropower/gen-info/guidelines/eaguide.pdf

Flint, L.E.; Flint, A.L.; Thorne, J.H.; and Boynton, R., *Fine-Scale Hydrologic Modeling for Regional Landscape Applications: The California Basin Characterization Model Development and Performance* (2013)

Goodman, D.H. and Reid, S.B,, *Regional Implementation Plan for Measures to Conserve Pacific Lamprey (Entosphenus tridentatus),California - North Coast Regional Management Unit,* Arcata Fisheries Technical Report TR 2015-21(January 2015)

Hinton, D.; Hughes, B.; Zapel, E., *Scott Dam Spillway – Comparing physical model study results,* Northwest Hydraulic Consultants (2015) available at http://www.nhcweb.com/upload/news/Scott_Dam_Spillway_-_HydroVision_2015_-_R1.pdf

Ingram, B.L., and Malamud-Roam, F.,*The West Without Water: What Past Floods, Droughts, and Other Climatic Clues Tell us About Tomorrow*. University of California Press (2013)

Isaak, D.J.; Wenger, S.J.; Peterson, E.E.; Ver Hoef, J.M.; Hostetler, S.W.; Luce, C.H.; Dunham, J.B.; Kershner, J.L.; Roper, B.B.; Nagel, D.E.; Chandler, G.L.; Wollrab, S.P.; Parkes, S.L.; Horan, D.L. 2016. *NorWeST modeled summer stream temperature scenarios for the western*

U.S. Fort Collins, CO: Forest Service Research Data Archive available at https://doi.org/10.2737/RDS-2016-0033

Livneh, B.; Bohn, T.J.; Pierce, D.W.; Munoz-Arriola, F.; Nijssen, B.; Vose, R.; Cayan, D.R.; and Brekke, L., *A Spatially Comprehensive, Hydrometeorological Data Set for Mexico, the U.S., and Southern Canada 1950–2013* (2015)

Luce, C.; Staab, B.; Kramer, M.; Wenger, S.; Isaak, D.; and McConnell, C., *Sensitivity of Summer Stream Temperatures to Climate Variability in the Pacific Northwest* (2014) Water Resources Research 50:3428–3443. doi: 10.1002/2013WR014329

Maurer, E.P.; Wood, A.W.; Adam, J.C.; Lettenmaier, D.P. and Nijssen, B., *A long-term hydrologically based dataset of land surface fluxes and states for the conterminous United Stated.* Journal of Climate 15 (22): 3237-3251 (2002)

Mayer, T.D., *Controls of Summer Stream Temperature in the Pacific Northwest* (2012)

Melosh, G., *Geologic Risks at the Potter Valley Project* (July 20, 2017), available at https://drive.google.com/file/d/0B8LzWutg0vukcWpsbEJycFlLbTg/view?usp=sharing

Moyle, P.B.; Lusardi, R.; Samuel, P.; and J. Katz *State of the Salmonids: Status of California's Emblematic Fishes, 2017. 555pp.* San Francisco, CA (2017)

National Marine Fisheries Service ("NMFS"), *Biological Opinion for the proposed license amendment for the Potter Valley Project* (2002)

National Marine Fisheries Service ("NMFS"), *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River watershed* (September 24, 2008)

National Marine Fisheries Service ("NMFS"), *Coastal Multispecies Recovery Plan. West Coast Region*. Santa Rosa, California. (2016)

National Marine Fisheries Service ("NMFS"). *Final recovery plan for the southern Oregon/northern California coast evolutionarily significant unit of Coho salmon* (*Oncorhynchus kisutch*). National Marine Fisheries Service. Arcata, CA. 1841 pp. (2014)

North Coast Regional Water Quality Control Board, *Water Quality Control Plan for the North Coast Region* (2011)

Northwest Regional Sediment Evaluation Team ("RSET"), *Sediment Evaluation Framework for the Pacific Northwest.* 160 pp plus appendices. (July 2016)

NOAA Technical Memo 8/16/12 Viability Assessment

Null, S.E.; Viers, J.H.; Deas, M.L.; Tanaka, S.K.; and Mount, J.F., *Stream Temperature Sensitivity to Climate Warming in California's Sierra Nevada: Impacts to Coldwater Habitat*. Climatic Change 116:149–170. doi: 10.1007/s10584-012-0459-8 (2013)

O'Dowd, A. and Trush, W., *FOER Blockwater Investigation Final Memo* (August 5, 2015)

Pacific Gas and Electric ("PG&E"), *Summer water temperature monitoring plan. Addressing NMFSMeasure 8 (in part) and License Article 57.* Potter Valley Hydroelectric Project FERC Project No.77. (2005)

Pacific Gas and Electric Company ("PG&E"), *Safety and Enforcement Division Risk Assessment Section Staff Report*, 2017-2019 General Rate Case Application A.15-09-001 (March 7, 2016) available at www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=10180

Palmer, M. A.; Lettenmaier, D. P.; Poff, N. L.; Postel, S. L.; Richter, B.; and Warner, R., *Climate Change and River Ecosystems: Protection and Adaptation Options,* Environmental Management (2009)

Pejchar, L., and Warner, K., *A River Might Run Through It Again: Criteria for Consideration of Dam Removal and Interim Lessons from California* (2001) available at http://conservationcorridor.org/wp-content/uploads/damrem_pejcharandwarner_2001_critdamremovalca_prj.pdf

Perry, R.W.; Risley, J.C.; Brewer, S.J.; Jones, E.C.; and Rondorf, D.W., *Simulating Daily Water Temperatures of the Klamath River under Dam Removal and Climate Change Scenarios*. U.S. Geological Survey Open-File Report 2011-1243:78pp.(2011)

Pierce, D.W.; Cayan. D.R.; and Thrasher, B.L., *Statistical Downscaling Using Localized Constructed Analogs (LOCA).* Journal of Hydrometeorology 15:2558–2585. doi: 10.1175/JHM-D-14-0082.1. (2014)

Poléo, A. Aluminum polymerization—a mechanism of acute toxicity of aqueous aluminum to fish. Aquatic Toxicology. Vol. 31, Issue 4: 347-356. (1995)

Powers, P. D. and Orsborn, J.F., *Analysis of Barriers to Upstream Fish Migration- An Investigation of the Physical and Biological Conditions Affecting Fish Passage Success at Culverts and Waterfalls,* Bonneville Power Administration, Contract DE-A179-82BP36523, 119 p. (1985)

Prince, D. J.; O'Rourke, S. M.; Thompson, T. Q.; Ali, O. A.; Lyman, H.S.; Saglam, Ismail K.; Hotaling, T. J.; Spidle, A. P.; Miller, M. R., *The evolutionary basis of premature migration in Pacific salmon highlights the utility of genomics for informing conservation*. Science Advances (August 18, 2017)

R. G. Bea Center for Catastrophic Risk Management University of California Berkeley, *Preliminary Root Causes Analysis of Failures of the Oroville Dam Gated Spillway* (April 17, 2017)

Quinones, R. M.; Grantham, T. E.; Harvey, B. N.; Kiernan, J. D.; Klasen, M.; Wintzer, A. P.; and Moyle, P. B.; *Dam removal and anadromous salmonid (Oncorhynchus spp.) conservation in California* (May 21, 2014)

Railsback, S.F.; Harvey, B.C.; Kupferberg, S.J.; Lang, M.M.; McBain, S.; Welsh,Jr., H.H., Modeling potential river management conflicts between frogs and salmonids. Canadian Journal of Fisheries and Aquatic Sciences, 73(5):773-784. (2016)

Rheinheimer, D. E.; Null, S. E.; and Viers, J. H., *Climate-Adaptive Water Year Typing for Instream Flow Requirements in California's Sierra Nevada.* Journal of Water Resources Planning and Management (2016)

Sonoma County Water Agency, *Draft Environmental Impact Report for Fish Habitat Flows and Water Rights Project* (SCH #2010092087) (August 19, 2016) available at http://www.scwa.ca.gov/files/Fish%20Flow%20DEIR%20Full%20Document.pdf; Errata http://www.scwa.ca.gov/files/FishFlow_DEIR_Errata_012617_FINAL_Remediated.pdf

Stillwater Sciences, *Evaluation of barriers to Pacific lamprey migration in the Eel River basin.* Prepared by Stillwater Sciences, Arcata, California for Wiyot Tribe, Loleta, California (2014)

Tullos, D.D.; Ryan, M.J.; Bellmore, J.R.; Bountry, J.A.; Connolly, P. J.; Shafroth, P.B.; and Wilcox, A.C. *Synthesis of Common Management Concerns Associated with Dam Removal,* Journal of the American Water Resources Association (2016)

U.S. Bureau of Reclamation ("Reclamation"), *Quality Assurance Project Plan. Sediment Contaminant Study, Klamath River Sediment Sampling Program* (2010)

U.S. Environmental Protection Agency ("EPA"), *Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury), Total Maximum Daily Loads for Temperature and Sediment* (2004)

U.S. Environmental Protection Agency ("EPA"), *Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury), Total Maximum Daily Loads for Temperature and Sediment.* (2004)

VTN Oregon, Inc., *Fisheries Study Final Report. Prepared for Pacific Gas and Electric Company, San Ramon, California*. Potter Valley Project (FERC No. 77) (1982)

Wenger, S.J.; Luce, C.H.; Hamlet, A.F.; Isaak, D.J.; and Neville, H.M., *Macroscale Hydrologic Modeling of Ecologically Relevant Flow Metrics* (2010) doi: 10.1029/2009WR008839.

Wolfe, M. F.; Schwarzbach, S.; and Sulaiman, R. A., *Effects of Mercury on Wildlife: A Comprehensive Review,* Environmental Toxicology and Chemistry Vol. 17, No. 2, pp 146-160 (August 22, 1997)

CONCLUSION

For the foregoing reasons, the Conservation Groups respectfully request that the Commission consider their comments and study requests.

DATED: August 3, 2017

SHUTE, MIHALY & WEINBERGER LLP

By: 

AMY J. BRICKER

Attorneys for FRIENDS OF THE EEL RIVER
396 Hayes Street
San Francisco, CA 94102
Telephone: (415) 552-7272
Facsimile: (415) 552-5816
Bricker@smwlaw.com

Theresa L. Simsiman
California Stewardship Director
American Whitewater
(916) 835-1460

Curtis Knight
Executive Director
California Trout
360 Pine Street, 4th Floor
San Francisco, CA 94104
Phone (415) 392-8887
Fax (415) 392-8895

Chris Shutes
FERC Projects Director
California Sportfishing Protection Alliance
1608 Francisco Street
Berkeley, CA 94703
(510) 421-2405
blancapaloma@msn.com

Scott Greacen
Executive Director
Friends of the Eel River
PO Box 4945
Arcata, CA 95518
(707) 822-3342
scott@eelriver.org

Ron Stork
Senior Policy Staff
Friends of the River
1418 20th Street, Suite 100
Sacramento, CA 95811
(916) 442-3155 x 220
rstork@friendsoftheriver.org

Mark Sherwood
Executive Director

Jake Crawford
Southern Regional Manager

Native Fish Society
813 7th Street, Suite 200A
Oregon City, OR 97045
(503) 344-4218
jake@nativefishsociety.org

Brian J. Johnson
California Director
Trout Unlimited and the Redwood Empire Chapter of Trout Unlimited
4221 Hollis St.
Emeryville, CA 94608
(510) 528-4772
bjohnson@tu.org

Exhibit 1: Report by Greg Kamman of Kamman Hydrology & Engineering, Inc.

Exhibit 2: Report by Scott Stephens of Miller Pacific Engineering Group

Appendix A: Study Requests

911660.10

CERTIFICATE OF SERVICE

I hereby certify that I will on this day serve a copy of the foregoing document, via electronic or first class mail, to each person designated on the official service list compiled by the Secretary in this proceeding.

Executed in San Francisco, California on August 4, 2017.

/s/ Patricia Larkin
PATRICIA LARKIN