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July 23, 2013

Filed via Electronic Submittal (E-File)

Honorable Kimberly D. Bose, Secretary Federal Energy Regulatory Commission 888 First Street, NE Washington, DC 20426

SUBJECT: Yuba River Development Project FERC Project No. 2246-058 - California Response to USFWS' Request for Narrows 2 Power Intake Entrainment Study

Dear Secretary Bose:

This letter provides the Yuba County Water Agency's (YCWA or Licensee) comments on the United States Department of Interior, Fish and Wildlife Service's (USFWS) July 3, 2013 request for a new study in support of YCWA's relicensing of its Yuba River Development Project, Federal Energy Regulatory Commission (FERC) Project Number 2246 (Project).

YCWA notes that the California Department of Fish and Wildlife (CDFW) filed a similar request with FERC on July 3, 2013. YCWA filed comments with FERC on CDFW's request on July 17, 2013.

#### COMMENTS

YCWA organized its specific comments to address the criteria for a new study identified by FERC in 18 CFR § 5.15(e).

### § 5.15(e)(1). Any material changes in the law or regulations applicable to the information request

USFWS did not base its request on material changes in applicable law and regulations, or the implementation of those laws and regulations. YCWA is unaware of any laws or regulations that have changed since FERC's Determination that would support USFWS' request.

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## § 5.15(e)(2). Why the goals and objectives of any approved study could not be met with the approved study methodology

USFWS stated "the goal and objectives described in Study 3.11 cannot be met through the methods used for data collection in Study 3.11." and that "The goals and objectives of Study 3.11 were designed to determine if entrainment is occurring at YCWA's Project facilities and to quantify those rates of entrainment." More specifically, USFWS stated "This method of data collection [in Study 3.7] can only provide presence or absence information in the vicinity of the Narrows 2 powerhouse intake and cannot be used to determine whether entrainment into project facilities is occurring or to quantify entrainment rates as outlined in the goals and objectives of Study 3.11."

USFWS misstated the goal of Study 3.11 regarding the Narrows 2 Power intake. The FERCapproved study's stated goal was to "characterize the occurrence of fish in the deeper portions of New Bullards Bar" to determine if the potential for entrainment into the intake warranted further investigation. The goal was not to "determine whether entrainment into project facilities is occurring or to quantify entrainment rates," as stated by USFWS. YCWA suspects that USFWS confused the Study 3.11 goal regarding entrainment at the Lohman Ridge and Camptonville diversion tunnels, which was to quantify entrainment rates at those particular locations, with the study goal for Narrows 2.

In fact, the goal and objective of Study 3.11 with regards to the Narrows 2 Power Tunnel intake were met by the approved study methodology. As described below, the study characterized the occurrence of fish in the deeper portions of Englebright Reservoir. Since a very small number of fish was captured in the vicinity of the intake, representing species that have been regularly stocked for recreational fishing in the reservoir, YCWA believes an extensive entrainment study at the Narrows 2 Power Tunnel intake is not needed.

#### § 5.15(e)(3). Why the request was not made earlier

USFWS has previously requested entrainment monitoring studies at the Narrows 2 Power Tunnel intake. These requests and FERC's disposition of each are described below.

#### USFWS' Request in Response to YCWA's Proposed Study Plan

In its April 2011 Proposed Study Plan, YCWA proposed to perform a study (Study 3.11) to supplement existing, relevant and reasonably available information regarding the effects on fish populations due to entrainment into Project intakes. YCWA's study plan specifically excluded the Narrows 2 Power Tunnel from direct study for four reasons: 1) lack of any information that suggested entrainment was an issue; 2) the large size of United States Army Corps of Engineer's (USACE) Englebright Reservoir, and the relatively deep location of the intake, which together would limit the susceptibility of fish to entrainment; 3) only one special-status fish species, hardhead minnow (*Mylopharodon conocephalus*)<sup>1</sup> occurs in the reservoir, and that species

<sup>&</sup>lt;sup>1</sup> CDFW considers hardhead minnow a species of special concern.

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frequents shallow habitat; and 4) the reservoir is heavily stocked.<sup>2</sup> No fishes listed as threatened or endangered under the Endangered Species Act (ESA) occur upstream of Englebright Dam. However, as part of Study 3.11, YCWA proposed to include in its Study 3.7, *Reservoir Fish Populations*, placement of gill nets as near as reasonably possible to the Narrows 2 Power Tunnel intake to help characterize the occurrence and characteristics of fish in the deeper portions of Englebright Reservoir, which would indicate the likelihood of fish entrainment into the intake, to inform any future discussions of entrainment into the intake.

In its July 15, 2011 comments on YCWA's Proposed Study Plan, USFWS said it supported CDFW's requested Study 3.11 modifications, which requested entrainment monitoring into the Narrows 2 Power Tunnel Intake for 1 year using a DIDSON-type acoustic camera.

In addition, USFWS proposed a new study named *Estimation of Downstream Migration of O. mykiss in the Yuba River*, which included a Narrows 2 Power Tunnel entrainment component. The primary goal of the study was to gather information on the downstream migration of *O. mykiss*. The new study included inserting acoustic tags into rainbow trout upstream of Englebright Dam, and tracking these fish if they moved downstream via two new remote sensing units in Englebright Reservoir, one near the Narrows 2 Power Tunnel intake, and existing acoustic arrays in the Yuba and Feather rivers.

#### USFWS' Request in Response to YCWA's Revised Study Plan and YCWA's Response

YCWA did not adopt CDFW's requested modification to Study 3.11, which was supported by USFWS, in its August 2011 Revised Study Plan because it believed existing information, as augmented by the proposed Study 3.7 gill netting was adequate to inform license requirements. Given this, YCWA stated the high cost of the requested modification to Study 3.11, and the fact that the methods were experimental at best, was not warranted. The cost of renting a DIDSON camera is currently about \$12,000 per month. In addition, deploying it in deep water requires significant preparation and is potentially a high risk operation. As an example, DIDSON installation near the intake would involve construction of a device on which to anchor the DIDSON by divers at significant depth in Englebright Reservoir during Project outages. Placing, maintaining and removing a DIDSON near the intake could also require obtaining variances from minimum instream flow requirements.

During the requested study, YCWA would need to coordinate with the California Independent System Operator (Cal ISO) to allow the required outages during *in situ* monitoring and retrieval of data from the DIDSON, which would require low flows for safety purposes. Since the Narrows 2 Powerhouse, Partial-Bypass and Full Bypass operate off the same intake, there could be a risk to downstream Endangered Species Act (ESA)-listed fish species if the powerhouse

<sup>&</sup>lt;sup>2</sup> The study plan stated "CDFG stocking records indicate that fish plantings in the USACE's Englebright Reservoir have taken place from 1965 through 2007. During this period, just over 756,000 rainbow trout, 228,320 kokanee salmon, 6,973 lake trout, nearly 28,000 brown trout (Salmo trutta), 4,000 Eagle Lake rainbow trout, 2,640 brook trout, 45 white crappie (Pomoxis annularis), and 80 black crappie (P. nigromaculatus) were planted (CDFG 2007). Stocked species were primarily from the Shasta and San Joaquin hatcheries." In 2008, CDFG stocked approximately 10,000 rainbow trout and 3,500 brown trout in the reservoir. Stocking by CDFG ceased for a period after 2008, pending a pre-stocking evaluation (CDFG 2008), but resumed in 2011, with the planting of 5,000 triploid (sterile) rainbow trout. In 2012, CDFW stocked 8,000 triploid rainbow trout in Englebright Reservoir.

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needs to be regularly shut down over the course of a year to install, check and remove the DIDSON when flows in the Yuba River are higher than can be accommodated through the Narrows 1 Powerhouse. It would probably not be safe to deploy divers during spills over Englebright Dam, so DIDSON monitoring during these periods would be extremely difficult.

YCWA did not adopt USFWS' proposed *Estimation of Downstream Migration of O. mykiss in the Yuba River Study*, for the reasons stated above. In addition, YCWA noted that anadromous fish do not occur upstream of Englebright Dam (i.e., no outmigration), and portions of USFWS' requested study appeared to be research. The sizes of fish captured during the gillnetting at depth in Englebright Reservoir were not indicative of juvenile lifestages, so the only fish potentially exposed to entrainment through the Narrows 2 Powerhouse were not likely expressing an anadromous life history. Results of the requested study would, therefore, not inform license requirements.

In its September 1, 2011 comments on YCWA's Revised Study Plan, USFWS repeated its support of CDFW's request for DIDSON-type monitoring for a year at the Narrows 2 Power Tunnel intake, and reiterated its request for its *Estimation of Downstream Migration of O. mykiss in the Yuba River Study*.

<u>FERC's Determination on USFWS's Request in Response to YCWA's Revised Study Plan</u> In its September 30, 2011 Study Plan Determination, FERC did modify Study 3.11 regarding entrainment at Our House and Log Cabin diversions, but did not adopt CDFW's, or USFWS's, modification to Study 3.11 pertaining to entrainment at Narrows 2<sup>3</sup>, stating:

Regarding Cal Fish and Game's request to monitor entrainment at the Narrows 2 powerhouse intake (in Englebright reservoir) utilizing a DIDSON-type acoustic camera and NMFS' requests for entrainment monitoring at New Bullards Bar and Narrows 2 intakes, YCWA proposes, and we recommend, the implementation of study 3.7 – *Reservoir Fish Populations* first. In section 3.2.1 of its proposed fish entrainment study, YCWA proposes to review the resulting data from study 3.7 to determine if fish behavior and utilization of the reservoirs would warrant evaluating the potential for entrainment at the New Bullards Bar and/or the Narrows 2 powerhouse intake structures. Additionally, we note that Cal Fish and Game's proposed modification to YCWA's fish entrainment study may provide information on adfluvial downstream migrations that may also inform the need for additional entrainment analysis at New Bullards Bar and Narrows 2 intakes, as well as the other project facilities requested by the NMFS.

Neither did FERC adopt USFWS's *Estimation of Downstream Migration of O. mykiss in the Yuba River Study*, stating:

We do not recommend implementation of FWS' requested study and its associated methodology. We conclude that results of the modified study

3.11 *Fish Entrainment* may inform the need for an evaluation of downstream *O. mykiss* migration from the upper Yuba River and project effects. If study results indicate additional study is warranted, study request(s) could be sought through section 5.15(e) of the Commission's regulations.

#### <u>USFWS' Request in Response to YCWA's Initial Study Report, and FERC's</u> <u>Determination</u>

YCWA filed its Initial Study Report, which did not include a proposal for Narrows 2 Power Tunnel entrainment monitoring in December 2012.

Prior to filing the report, YCWA issued Technical Memorandum 3-7, *Reservoir Fish Populations*, which provided the results of YCWA's sampling in Englebright Reservoir. Nine sites were sampled: five by boat electrofishing and four by gillnetting, with one gill net set 50 feet east of the Narrows 2 Power Tunnel intake and extended perpendicular to the shore. The net was set at approximately 20 feet from shore and extended 125 feet into the reservoir at an estimated depth of 70 feet. The surface elevation for Englebright Reservoir fluctuated between 517 feet and 523 feet during the 2012 sampling period. The intake centerline is at 439 feet of elevation. This translated to a center line depth ranging from 78 feet (68 – 88 ft depth) to 84 ft (74 to 94 ft). The net sampled depth was 70 to 90 ft, generally covering an average area of 80 percent of the intake area. The placement of this net location was specifically selected through consultation with CDFW staff and Forest Service staff who were onsite prior to field implementation. USFWS was invited, but was not able to attend. The gillnet was fished twice during June, for approximately 10.5 hours during the day and 13.5 hours during the night. During the sample period, flow remained relatively stable and ranged from 1,133 to 1,140 cfs, which would result in a calculated intake velocity of 3.8 ft/sec.



Figure 1. Placement of the deepwater gillnet in Englebright Reservoir near the Narrows 2 Power Tunnel intake. Orange buoys show the orientation of the net, the top of which was at a depth of approximately 70 feet.

A total of 362 fish comprised of 11 species was collected by electrofishing (i.e., 283 fish, representing 78% of the total catch) and gillnetting (i.e., 79 fish and 22%) in Englebright The majority of the fishes collected were warmwater (i.e., 3 of 11 species, Reservoir. representing 52% of the total catch by number) and non-native (i.e., 6 of 11 species representing 38% of the total catch by number). Species found, in order of abundance, were Sacramento sucker (Catostomus occidentalis) (31.5% of the total catch), spotted bass (Micropterus punctulatus) (26.5%), hardhead (13.5%), rainbow trout (Oncorhynchus mykiss) (8.3%), bluegill (Lepomis macrochirus) (7.5%), Sacramento pikeminnow (Ptychocheilus grandis) (6.9%), common carp (Cyprinus carpio) (1.9%), brown trout (Salmo trutta) (1.7%), smallmouth bass (*Micropterus dolomieu*) (1.4%), green sunfish (*Lepomis. cyanellus*) (0.65%) and redear sunfish (Lepomis microlophus) (0.3%).<sup>3</sup> Rainbow trout and brown trout have been stocked in the reservoir for many years by CDFW, with rainbow trout stocked as recently as 2012, and brown trout as recently as 2008, as described in footnote 4. Three fish, two rainbow trout and one brown trout, were captured in the deepwater gillnet near the Narrows 2 Power Tunnel intake. Trout ranged in fork length from 217 to 305 millimeters (mm). YCWA summarized these results in its November 2012 Interim Technical Memorandum 3-11, Entrainment.

<sup>&</sup>lt;sup>3</sup> Fishes which have been reported to occur in the reservoir and not found by YCWA's 2012 study include three species planted by CDFW: kokanee (*Oncorhynchus nerka*) planted in 1965, 1966 and 1977; brook trout (*Salvelinus fontinalis*) planted in 1986; and lake trout (*S. namaycush*) planted in 1965 and 1966; and the following four warmwater species: channel catfish (*Ictalurus punctatus*); largemouth bass (*Micropterus salmoides*); various crappies (*Pomoxis* sp.); and yellow perch (*Perca flavensis*).

In its Initial Study Report meeting, YCWA encouraged Relicensing Participants to request any and all study modifications and new studies the Relicensing Participants considered warranted, but noted study-specific consultations, including regarding Study 3.11, were ongoing.

Only USFWS requested Narrows 2 Power Tunnel entrainment monitoring in comments on the Initial Study Report. The United States Department of Interior, Fish and Wildlife Service (USFWS) requested a study of fish entrainment at the Narrows 2 Power Tunnel intake "for determining Project effects on salmonid outmigration."

As stated under YCWA's General Comments, FERC's March 29, 2013 Determination did not adopt USFWS' request because "only a small portion of fish capable of frequenting deep water would be found in proximity of the intake."

#### USFWS' Request in Response to Study 3.11 Study-specific Consultation

As required by Study 3.11, YCWA scheduled meetings with Relicensing Participants to discuss the results of the gillnetting and the need for additional Narrows 2 Power Tunnel entrainment monitoring. The meetings occurred on January 10, February 8, March 11, April 11, June 5 and June 10, 2013. In many of the earlier meetings, CDFW and USFWS advised YCWA that it was considering the need for additional entrainment monitoring at the Narrows 2 Power Tunnel intake. YCWA stated it believed existing information was adequate, specifically noting: 1) the high level of stocking, especially of rainbow trout, that occurs in the reservoir; 2) the large size of the reservoir and relatively deep location of the intake, which together limit the susceptibility of fish to entrainment; 3) that only one special-status fish species, hardhead minnow, occurs in the reservoir and it frequents shallow habitats, which are not near the intake; 4) the majority of rainbow trout found in the reservoir in Study 3.7 were near the surface; 5) the high cost of studies suggested to reliably sample 100 percent of the flow into the intake as compared to the low value of the information that would be developed; and 6) trout of the sizes captured in the deep gillnetting site could easily avoid entrainment into the intake.<sup>4</sup>

Further, YCWA stated that if entrainment were to occur, survival through the Francis turbines in the Narrows 2 Powerhouse would be relatively high. The Narrows 2 Powerhouse turbine is 130 inches in diameter, contains 15 buckets, and rotates at 163.6 revolutions per minute (rpm). In 2007, PG&E conducted a survival test on their similar turbine unit for the McCloud-Pit Project (P-2106).<sup>5</sup> That turbine unit is 216 inches in diameter, contains 15 buckets and rotates at 138.4 rpm. PG&E found 93.9 percent survival in smaller rainbow trout (i.e., fork length of 103 to 178 mm) and 83.5 percent survival in larger rainbow trout (i.e., fork length of 282 to 383 mm). All of the surviving larger rainbow trout were malady-free (i.e., did not show signs of injury) and 89.8 percent of the smaller surviving rainbow trout were malady free. Overall, the

<sup>&</sup>lt;sup>4</sup> The velocity at the Narrows 2 Power Tunnel intake is 10.8 ft/sec at the maximum capacity (i.e., 3,400 cfs). Measured adult rainbow trout burst speed is 13.4 fish-lengths/sec (i.e., for a 12-inch long fish, the burst speed is 13.4 ft/sec). The entrainment velocity decreases rapidly with distance from the intake.

<sup>&</sup>lt;sup>5</sup> PG&E. 2007. Fish Survival and Condition after Passage through Pit 6 Turbine (FA-S7). Link: http://www.eurekasw.com/MCP/Technical%20Memos/TM-17%20FA-S7%20Entrainment%20Survival.pdf

study showed reasonably high survival results and provides an excellent indication of survivorship of the few rainbow trout that potentially pass through the Narrows 2 Powerhouse.

At the June 5, 2013 meeting, agencies proposed a new Narrows 2 Power Tunnel intake entrainment study. For the reasons noted above, YCWA did not agree with the need for the study.

## § 5.15(e)(4). Significant changes in the project proposal or that significant new information material to the study objectives has become available

USFWS did not base its request on changes in the proposed Project. YCWA has not proposed changes to the Project that would warrant the requested new study.

USFWS justified its request, in large part, on the "new information"<sup>6</sup> from YCWA's Study 3.7. USFWS stated, "Further, analysis of YCWA's [Study 3.7] gillnetting data show that rainbow trout comprised the majority of species caught in all deep water net sets (Table 3.0-1). This significant new information documents the presence of trout species in deep water habitat in proximity to the Narrows 2 intake that are therefore at an increased risk of entrainment into the Narrows 2 intake." USFWS discussed this "new information" under § 5.9(b)(3) in its letter. YCWA addresses this "new information" here.

YCWA believes that a number of conclusions drawn by USFWS based on the "new information" warrant clarification.

First, USFWS stated "a single day of sampling event can do little more than provide presence or absence data and does not take into account temporal or spatial life history behavior of resident aquatic species.' YCWA agrees, which is why it is important to consider other existing and known scientific information, such as that resident trout during their early life history generally occupy low velocity, littoral habitat and are not commonly found in pelagic or deep water, which is where the Narrows 2 Power Tunnel intake is located. This was confirmed during Study 3.7. Also, larger fish that may be found in pelagic, deepwater habitat are capable of significantly greater swim speeds. As stated earlier, a 12 inch fish would be capable of burst swimming speeds of 13.4 ft/sec. Fish would have to be in the immediate vicinity of the trashrack to be exposed to sufficient velocity to pose any entrainment risk, and these fish can avoid entrainment. Other existing information to consider is that, if entrained, the potential for survival is high survival was 93.1 percent in studies monitoring trout survivorship through Francis turbines similar to those in Narrows 2 Powerhouse. Also, one needs to consider that CDFW annually stocks thousands of rainbow trout in Englebright Reservoir, one of the only two species found (at low numbers) near the intake, to sustain a recreational fishery. One angler's daily legal catch in the reservoir is more than the number of fish seen at the vicinity of the intake over the period of one day that the gillnet was fished. Brown trout, the species represented by the other single individual found at that location, has apparently not been stocked in the reservoir since 2008. Since Narrows 2 Powerhouse has been operating during the intervening period and brown trout

<sup>&</sup>lt;sup>6</sup> As stated under YCWA's General Comments, this information is not new but was relied on by USFWS when it requested, and FERC rejected, a new Narrows 2 Power Tunnel intake entrainment study.

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are still found (2% of the total catch) in the reservoir, this population has been surviving or selfsustaining despite any potential entrainment or ongoing angler harvesting. All of these factors provide sufficient additional information to add context for the results of the single sampling event to help support the conclusion that an entrainment study at the Narrows 2 Powerhouse is unnecessary.

Second, USFWS stated "*Results reported in TM 3.7 demonstrate that rainbow and brown trout are found in close proximity to the Narrows 2 intake structure (YCWA table 3.0-1).*" Stating that nets were in 'close proximity' is misleading. The sample nets were placed in an area that was considered safe, but close enough to suggest that collected fish were in the general area and depth where the intake occurred. The nets were 50 ft from the actual intake and 20 ft offshore (Figure 1). To place the nets within 'close proximity' or the influence of entrainment (i.e., less than 5 ft from the intake) was not prudent or acceptable to YCWA operators. Agencies agreed to the location and the placement was collaborative. Therefore, a more accurate description is that nets were in the vicinity of the Power Tunnel intake.

Third, USFWS stated "rainbow trout comprised the majority of species caught in all deep water net sets (n = 4 gill net sets" and "The majority of all salmonids caught by gill net in Englebright were observed in deep water nets." A full analysis of the "new" information, however, shows that of the 362 fish collected in Englebright Reservoir during Study 3.7, rainbow trout comprised only 8.3 percent of the total catch, and only two (~4%) of the 45 rainbow trout captured were found in the deepwater gillnet near the Narrows 2 Power Tunnel intake. The vast majority of rainbow trout was found in shallow waters (although by other sampling modes), where they are not subject to entrainment. Only one additional fish was collected in deepwater.

In summary, the "new" information cited by USFWS shows that only a small portion of fish capable of frequenting deep water in Englebright Reservoir would be found in the vicinity of the intake, and these fish are fully capable of actively avoiding entrainment. In addition, even if the fish were entrained, existing information indicates that survival through the Narrows 2 Powerhouse would be high.

#### § 5.15(e)(5). Why the new study request satisfies the study criteria in § 5.9(b)

## § 5.9(b)(1). Describe the goals and objectives of each study proposal and the information to be obtained

USFWS stated that "The goal of this study is to evaluate and quantify entrainment risks at the Narrows 2 intake powerhouse, and to determine whether the withdrawal of water at the Project's primary intake at Englebright Reservoir is likely to have adverse effects on native and non-native fish populations.

"Objectives in support of this goal include:

1. Quantify rates of entrainment at the Narrows 2 intake;

- 2. Evaluate entrainment effects to salmonid species passing through the Narrows 2 Powerhouse to the Lower Yuba River;
- 3. Evaluate the genetic potential contribution of native and stocked trout to the genetic profile of rainbow and steelhead trout in the Lower Yuba River; and
- 4. Evaluate adfluvial migration of native trout species."

With regards to USFWS' first objective, as stated above, YCWA believes that even if the small number of fish found in the vicinity of the Narrows 2 Power Tunnel intake were to be entrained and not survive passage downstream, it is unlikely that this would adversely affect the large, annually stocked population of rainbow trout or the brown trout which have been surviving there since the last stocking in 2008. YCWA therefore believes existing information is adequate to inform license requirements regarding entrainment at Narrows 2 Power Tunnel intake and the risk of salmonid mortality through the Narrows 2 Powerhouse.

YCWA is confused by USFWS' other objectives. Objectives 2 and 3 pertain to fish in the Yuba River downstream of the Narrows 2 Powerhouse. These objectives are to evaluate the effects of entrainment on the Lower Yuba River (Objective 2) and on the genetics of rainbow trout and steelhead in the Lower Yuba River. However, USFWS' requested study contains no methods that would in any way address these objectives. Other than noting that steelhead are not entrained since they do not occur in Englebright Reservoir, and that the study as requested cannot meet these objectives, YCWA cannot comment more on these objectives since no details are provided in the USFWS' new study request.

With regards to USFWS' fourth objective regarding '*adfluvial*' migration of native trout species, YCWA notes that the only native trout species in Englebright Reservoir is rainbow trout, and this species has been heavily stocked in the reservoir for almost 50 years.<sup>7</sup> An adfluvial fish is commonly defined as a species or subspecies that resides in lakes, but moves upstream into rivers to spawn (Slaney 2005).<sup>8</sup> A common example of this life history is found within subpopulations of bull trout (*Salvelinus confluentus*) in the northwest. YCWA cannot envision how an entrainment study at Narrows 2 Power Tunnel intake would provide information on rainbow trout migrating upstream into tributaries from Englebright Reservoir.

## § 5.9(b)(2). If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied

YCWA has no comment regarding this criterion.

<sup>&</sup>lt;sup>7</sup> See Footnote 2 for a description of fish stocking in Englebright Reservoir since 1965.

<sup>&</sup>lt;sup>8</sup> Slaney, P. and J. Roberts. 2005. Coastal Cutthroat Trout as Sentinels of Lower Mainland Watershed Health. Ministry of Environment Lower Mainland Region 2 Surrey, B.C. 104 pgs.

## § 5.9(b)(3). If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study

YCWA has no comment regarding this criterion.

## § 5.9(b)(4). Describe existing information concerning the subject of the study proposal, and the need for additional information

USFWS based the need for the additional information on the "new information" provided by YCWA's Study 3.7. YCWA addresses the "new" information from Study 3.7 under criterion § 5.15(e)(4) above.

# § 5.9(b)(5). Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements

USFWS provided two areas of nexus to the Project and how the requested study would help inform the development of license requirements. First, USFWS stated "The results of Study 3.7, reservoir fish study), *have demonstrated that native and non-native salmonid species are present in the vicinity of the Narrows 2 intake at Englebright reservoir.*" As discussed above, Study 3.7 shows that only a small portion of fish capable of frequenting deep water in Englebright Reservoir would be found in vicinity of the intake and those are of sufficient size to be able to escape entrainment. Further, anadromous fish do not occur in the Yuba River upstream of Englebright Dam. Therefore, the information from the requested study, which would be developed at significant cost as described below, would not provide substantial information to inform license requirements.

Second, USFWS stated "An earlier study (Garza and Pearse 2008) demonstrated the mixed origin of rainbow trout in the lower Yuba River, including the upper Yuba River genotype, and indicates that hatchery rainbow trout and resident rainbow trout could be passing through the Narrows 2 powerhouse."<sup>9</sup> USFWS' argument is flawed for several reasons. First, USFWS wrongly concludes that a genetic study that found some relatedness between O. mykiss in the upper Yuba River and the lower Yuba River indicates that rainbow trout are entrained at the Narrows 2 Power Tunnel intake. The cited study drew no such conclusion and to reach that determination from the study is not scientifically supported. Many confounding factors dilute this unsupported conclusion:

• The study suggested that all Central Valley naturally-spawning O. mykiss are closely related, regardless of whether they are currently above or below barriers to anadromy (page 18, Garza and Pearse 2008).

<sup>&</sup>lt;sup>9</sup> CDFW rightly does not cite Garza and Pearse (2008) as "new" information since it was available as early as 2008.

- The proximal basins, hatchery management, and angling activity (displaced catch and release) could easily result in a mixed genotype. All of these factors were not controlled for in the study, as that was not the purpose of the study.
- The upstream rainbow trout have the potential to pass downstream of Englebright Dam by means other than entrainment into the Narrows 2 Power Tunnel intake. For instance, the fish could pass over Englebright Dam when it spills, which occurs almost every year, and through PG&E's Narrows 1 Powerhouse.

# § 5.9(b)(6). Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge

USFWS proposes that its requested study would focus on resident rainbow trout and steelhead; the study period would be 1 year; and the sampling would occur using large tapered nets that would survey the entire flow in the Narrows 2 tailrace. USFWS states that floating platforms would be used to collect fish from live boxes at the end of the nets. USFWS proposes the sampling occur in two phases. The first phase would occur for two to four weeks in June and July, and would be conducted for four days per week, 24 hours per day. The second phase would extend from August through May and sampling would occur five to six days each month. The goal of the sampling is a confidence interval of  $\pm 50$  percent of the sampling mean.

YCWA has serious reservations concerning placing tapered nets to sample the full flow in the Narrows 2 Powerhouse tailrace for three reasons. First, the tailrace has a very irregular profile, so designing nets to match the profile and sample 100 percent of the flow would be very difficult.

Second, the tailrace is over 75 feet wide, spanning the Yuba River. To place and retrieve nets in the tailrace would require constructing a structure over the tailrace (e.g., a bridge working platform) from which the nets would be deployed and retrieved. This would be a very costly endeavor and require numerous permits (e.g., Clean Water Act Sections 404 and 401 permits, a Section 1601 permit from CDFW, and probably permits from NMFS since ESA-listed fishes could be affected).

Third, to sample the full flow in the Narrows 2 tailrace would require sampling potentially up to 180,000 cubic feet per second (cfs).<sup>10</sup> This is due in good part to spills over Englebright Dam, which occurs in most years. Figure 2 shows typical conditions and flows in the tailrace when Englebright Dam is spilling. Working large nets during spill conditions would be extremely difficult and dangerous, but could be necessary if trying to perform entrainment

<sup>&</sup>lt;sup>10</sup> On December 22, 1964, the flow in the tailrace was measured at 180,000 cfs. Recently (i.e., from 2002 through 2012), the flow in the Narrows 2 tailrace has been as high as 104,261 cfs.

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sampling over an entire year, or to ascertain the relative proportion of fish passing over Englebright Dam.



Figure 2. Typical conditions in the Narrows 2 tailrace when Englebright Dam spills.

As an alternative to placing nets across the entire tailrace to capture Englebright Dam spill, one could place nets at the three outlets from the Narrows 2 Power Tunnel: 1) the Narrows 2 Powerhouse, which has a maximum discharge capacity of 3,400 cfs; 2) the Narrows 2 Partial Bypass, which has a maximum discharge of 650 cfs; and 3) the Narrows 2 Full Bypass, which has a maximum discharge of 3,000 cfs. However, the configuration and flows through these outlets would make deploying and retrieving entrainment sampling nets, as well as efficiently sampling fish (i.e., nets large enough to withstand the flow and not damage fish), very difficult. Figure 3 shows the locations and typical operations of these facilities when in operation (i.e., some of these facilities operate infrequently or only for short periods).

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**Partial Bypass** 

**Partial Bypass** 

Narrows 2 Powerhouse



Narrows 2 Powerhouse

Full Bypass

Full Bypass

Figure 3. Photos showing configuration of discharge and typical operations of Narrows 2 Powerhouse, Narrows 2 Powerhouse Partial Bypass and Narrows 2 Powerhouse Full Bypass.

Besides these logistic issues, which YCWA believes in and of themselves makes USFWS' requested study not feasible, other questions can be raised regarding the study protocol. For instance, USFWS has provided no rationale for its sampling phases and frequencies.

Several references in support of full-flow netting were made from FERC (1995). While the approach is not questioned for certain applications, there were considerations not addressed by USFWS' request that were key factors in the full-flow netting report as performed by FERC (1995). The range of sampled full flow discharge references in FERC (1995) appeared to be up to 600 cfs and no reference was made to flows approaching the Narrows 2 Powerhouse capacity (i.e., 3,400 cfs) for full-flow netting.

FERC (1995) also acknowledged the following factors for determining whether a netting study is merited:

- "Guidelines suggested in this report are intended to aid in standardizing future entrainment sampling and reporting protocols. However, assessment of the need for studies, as well as the actual study design, is based on a number of factors, including the expected level of impact and the cost of the studies."
- "Because each site is unique, FERC staff will continue to assess entrainment impacts on a case-by-case basis. If the impact on resources at a site is expected to be high, accurate entrainment estimates will strengthen the basis for determining if fish protection is required."

These statements assert that it is important to identify a "high" potential level of impact to justify the cost of the study. FERC (1995) also stated that, "*Most entrained fish are small.*" All fish collected in proximity to the intake were adults, expected to be able to swim faster than calculated intake velocities, and avoid entrainment, as discussed earlier. YCWA does not see that three adult fish in the vicinity to the powerhouse necessitates such a study.

Further, as stated above, the methods put forth by USFWS for its requested study does not address three of the four study objectives USFWS says this study would address.

## § 5.9(b)(7). Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs

USFWS states that the cost to perform its requested study is between \$250,000 and \$300,000. YCWA believes this is a drastic underestimation of cost based simply on the logistic issues raised above.

As an example of how unreasonable USFWS' estimated cost is, as part of Nevada Irrigation District's Yuba-Bear Hydroelectric Project (FERC Project No. 2266) relicensing, NID performed an entrainment study in the Dutch Flat 2 Canal. The canal is a raised, wooden box flume (approximately 6 feet square), with straight sides and bottom, easy access and a maximum capacity of 800 cfs. NID built a structure over the flume to deploy and retrieve

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nets and sampled a couple of times each week for about 6 months. The cost to perform that study was nearly \$1 million. In comparison, USFWS' requested study includes sampling up to about 180,000 cfs over an irregular-shaped, natural channel for a year. Just designing and constructing structures on which to deploy and retrieve nets would cost over \$1 million dollars, without considering configuring the nets to capture 100 percent of the flow in the Narrows 2 Powerhouse tailrace.

YCWA believes existing information is adequate to inform license requirements, and that USFWS' extremely expensive study, would not provide additional information commensurate with the cost of the information.

For the reasons stated above, YCWA requests that FERC reject at this time USFWS' request for a new Narrows 2 Power Tunnel intake entrainment study.

If you have any questions regarding these comments, please contact me.

Sincerely,

YUBA COUNTY WATER AGENCY

Mrey X. Rabone

Curt Aikens General Manager

cc:

Alan Mitchnick – FERC DC Ken Hogan – FERC DC Relicensing Participants on YCWA's Yuba River Development Project's Relicensing E-Mail Contact List (via e-mail)