YUBA COUNTY WATER AGENCY

Yuba River Development Project
FERC Project No. 2246

New Bullards Bar Dam and Reservoir – North Yuba River

Revised Study Plan

[SECURITY LEVEL: PUBLIC]

August 2011

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Public Information

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EXECUTIVE SUMMARY

Pursuant to 18 CFR § 5.11 of the Federal Energy Regulatory Commission's (FERC or Commission) regulations, this Revised Study Plan includes the studies proposed by the Yuba County Water Agency (YCWA) that, when taken in combination with existing and relevant information, will provide sufficient information to develop license requirements for a Yuba River Development Project (Project) new license.

The Revised Study Plan contains six sections and two appendices. Section 1 describes the Project and relicensing activities to date. Section 2 describes the study proposals contained in the Revised Study Plan. The actual detailed study proposals are in Appendix 1. To facilitate FERC's and Relicensing Participants' review of the Revised Study Plan, YCWA has included in Appendix 2 redlined versions of the study proposals that show changes that were made to the study proposals in the Proposed Study Plan. Section 3 provides YCWA's replies to study modifications and new study requests that were filed with FERC related to YCWA's Proposed Study Plan. Section 4 describes provisions for YCWA's periodic progress reporting during study implementation. Section 5 describes the status of YCWA's evaluation of potential developmental (i.e., generation) enhancements to the existing Project. Section 6 includes a list of references cited in the Revised Study Plan.

While consensus on many issues associated with YCWA's Proposed and Revised study plans has been reached, some differences remain. However, YCWA would like to take this opportunity to thank and acknowledge the many representatives from agencies, tribes, non-governmental organizations (NGO) and the public who have actively participated in the relicensing process. Their input is valued and has improved each and every study proposal.

BACKGROUND

The Project is located in Yuba, Sierra, and Nevada counties, California, on the main stems of the Yuba River, the North Yuba River, and the Middle Yuba River, and on Oregon Creek, a tributary to the Middle Yuba River. A portion of the Project is located on federal land managed by the United States Department of Agriculture, Forest Service, as part of the Plumas and Tahoe national forests. Principal Project facilities include one storage reservoir, two diversion dams and tunnels, three powerhouses and seven recreation areas.

YCWA initiated its relicensing in September 2009, a year before formal relicensing began, when it issued a Preliminary Information Package. The package was formatted similar to and contained much of the information required to be included in a Pre-Application Document (PAD).

From issuance of the Preliminary Information Package through the filing of its PAD on November 5, 2010, YCWA held approximately 30 meetings with Relicensing Participants. The meetings included overviews of FERC's Integrated Licensing Process, detailed process

discussions, tours of the Project, issues/effects and information gap identification, and study plan development.

YCWA's November 2010 PAD included 41 detailed study plans on water use and allocation, water quality, fish and other aquatic resources, terrestrial resources, threatened and endangered species, recreation, aesthetic resources, and cultural resources.

Thirty comment letters on the PAD were filed in March 2011. The letters were from: FERC; United Auburn Indian Community; Forest Service; United States Department of Interior (USDI), National Parks Service (NPS); USDI, Fish and Wildlife Service (USFWS); United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); State Water Resources Control Board (SWRCB); California Department of Fish and Game (CDFG); Yuba County Fish and Game (YCFG); Camptonville Community Services District; and various NGOs and members of the public. The commenters requested modifications to 28 of the 41 study proposals in YCWA's PAD and 19 new studies.

On April 19, 2011, YCWA filed its Proposed Study Plan, which included 41 study proposals. These were the same studies identified in the PAD, but modified based on comments on the PAD and continuing discussions with Relicensing Participants.

Between April and July 2011, YCWA held approximately 20 meetings with Relicensing Participants, some of which included FERC staff, in an attempt to resolve differences regarding the proposed studies.

Eight comment letters were filed on the Proposed Study Plan. These were from: Forest Service; NPS; USFWS; NMFS; SWRCB; CDFG; YCFG; and Foothills Water Network (FWN), representing a consortium of NGOs. The commenters requested modifications to 29 of the 41 study proposals in YCWA's Proposed Study Plan and 11 new studies.

Before filing its Revised Study Plan, YCWA and Relicensing Participants held five meetings in an attempt to resolve differences regarding studies. Two of the meetings focused specifically on resolving disagreements with the Forest Service and NPS regarding the Recreation Use and Visitor Surveys Study (Study 8.1) and one of the meetings was an ESA Section 7 informal consultation meeting with NMFS.

STUDY STATUS

Studies Proposed By YCWA In The Proposed Study Plan

YCWA carefully reviewed each comment letter to identify requests to changes in Section 5.1 (Study Area) and Section 5.3 (Study Methods) of the study proposals in YCWA's Proposed

Study Plan.[1] YCWA found 110 specific requests for changes in these sections. YCWA adopted without modification 59 of the requested changes, adopted with modification 24 of the requested changes, and did not adopt 27 of the requested changes. Table ES1 shows by study which Relicensing Participants requested changes in the study, and the number of changes that YCWA adopted without modification, adopted with modification and did not adopt.

Table ES1. Adopted, modified and not adopted requests to modify studies in YCWA's Proposed Study Plan.

Study Number	Study Name	Commenter[1]	Number of Requests Adopted Without Modification	Number of Requests Adopted With Modification	Number of Requests Not Adopted	Total Number of Requests
1.1	Channel Morphology Upstream of Englebright Reservoir	NMFS	2	1	1	4
1.2	Channel Morphology Downstream of Englebright Dam	USFWS, NMFS, CDFG and SWRCB	6	2	4	12
2.1	Hydrologic Alteration	--	--	--	--	0
2.2	Water Balance/Operations Model	FWN	1	--	--	1
2.3	Water Quality	CDFG and SWRCB	--	--	2	2
2.2[2]	Bioaccumulation	CDFG	1	--	--	1
2.5	Water Temperature Monitoring	FWN	--	--	1	1
2.6	Water Temperature Model	CDFG	1	--	--	1
3.1	Aquatic Macroinvertebrates Upstream of Englebright Reservoir	Forest Service and CDFG	--	--	1	1
3.2	Aquatic Macroinvertebrates Downstream of Englebright Dam	USFWS	--	--	1	1
3.3	Special-Status Aquatic Mollusks	Forest Service	1	--	--	1
3.4	Special-Status Amphibians – Foothill Yellow-Legged Frog Surveys	--	--	--	--	0
3.5	Special-Status Amphibians – Foothill Yellow-Legged Frog Habitat Modeling	Forest Service and CDFG	--	1	--	1
3.6	Special-Status Turtles – Western Pond Turtle	Forest Service and CDFG	--	--	2	2
3.7	Reservoir Fish Populations	Forest Service and CDFG	1	--	--	1
3.8	Stream Fish Populations Upstream of Englebright Reservoir	Forest Service and CDFG	1	--	--	1
3.9	Non-ESA- Listed Fish Populations Downstream of Englebright Dam	CDFG	--	1	1	2
3.10	Instream Flow Upstream of Englebright Reservoir	Forest Service, USFWS, NMFS and CDFG	6	2	3	11
3.11	Fish Entrainment	Forest Service, USFWS and CDFG	--	--	3	3
4.1	Special-Status Wildlife – California Wildlife Habitat Relationships	--	--	--	--	0
4.2	Special-Status Wildlife – Bats	--	--	--	--	0

[1] YCWA has not specifically identified or addressed requested changes to sections of the study proposals besides requested changes to Section 5.1 (Study Area) and Section 5.3 (Study Methods) because changes in other sections would not affect the scope of any proposed study. It should not be inferred by YCWA's lack of reply to requested changes in sections other than 5.2 and 5.3 that YCWA has made or not made the change to that section or that YCWA agrees or disagrees with the requested change.

Table ES1. (continued)

Study Number	Study Name	Commenter[1]	Number of Requests Adopted Without Modification	Number of Requests Adopted With Modification	Number of Requests Not Adopted	Total Number of Requests
5.1	Special-Status Plants	--	--	--	--	0
6.1	Riparian Habitat Upstream of Englebright Reservoir	NMFS and FWN	4	4	1	9
6.2	Riparian Habitat Downstream of Englebright Dam	USFWS, NMFS and FWN	--	3	--	3
6.3	Wetlands	--	--	--	--	0
7.1	ESA-Listed Plants	USFWS	1	--	--	1
7.2	Narrows 2 Powerhouse Intake	USFWS and CDFG	--	1	2	3
7.3	ESA-Listed Amphibians – California Red-Legged Frog	USFWS	3	--	--	3
7.4	ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle	USFWS	1	--	--	1
7.5	CESA-Listed Plants	--	--	--	--	0
7.6	CESA-Listed and Fully Protected Wildlife – California Wildlife Habitat Relationships	--	--	--	--	0
7.7	CESA-Listed and Fully Protected Wildlife – Bald Eagle	--	--	--	--	0
7.8	ESA/CESA-Listed Salmonids Downstream of Englebright Dam	USFWS and NMFS	--	2	4	6
7.9	North American Green Sturgeon Downstream of Englebright Dam	USFWS, NMFS and CDFG	--	1	--	1
7.10	Instream Flow Downstream of Englebright Dam	USFWS and NMFS	1	--	1	2
7.11[2]	Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration	--	--	--	--	--
8.1	Recreation Use and Visitor Surveys	Forest Service and NPS	24	--	--	24
8.2	Recreational Flow	NPS	5	4	--	9
9.1	Primary Project Roads and Trails	--	--	--	--	0
10.1	Visual Quality	NPS	--	2	--	2
12.1	Historic Properties	--	--	--	--	0
13.1	Native American Traditional Cultural Properties	--	--	--	--	0
Number of Requested Changes by Category			*59*	*24*	*27*	*110*
Number of New Study Proposals on which Relicensing Participants Have Not Had an Opportunity to Comment		**1[3]**				
Number of Study Proposals in which No Changes Were Requested		**12**				
Number of Study Proposals in which All Changes Were Adopted Without Modification		**9**				
Number of Study Proposals in which All Changes Were Adopted Without Modification or With Some Modification		**6**				
Number of Study Proposals in which Some Changes Were Not Adopted		**14**				
Number of Studies in Revised Study Plan		**42**				

[1] Commenters that said they "supported" a request by another commenter, but did not request any modification to the study in addition to the commenter that requested the study modification or new study, are not listed.

[2] At the August 10, 2011 Relicensing Participants meeting, YCWA said that, based on its review of comment letters, YCWA found one request to change the scope of YCWA's Bioaccumulation Study: a comment by CDFG that a secondary objective of the study be to assess mercury's risk to piscivorous birds and that YCWA include in the study methods to do this. At the meeting, CDFG clarified that this was not a request for a study modification. Therefore, YCWA identified no requested changes to the Bioaccumulation Study.

[3] YCWA's proposed Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration (Study 7.11) is a new study that was not included in the Proposed Study Plan or otherwise reviewed by Relicensing Participants.

YCWA is confident that there is agreement among YCWA and Relicensing Participants on 21 studies: the 12 studies in YCWA's Proposed Study Plan on which no comments were filed and the nine studies in which YCWA adopted without modification all of the changes requested to the study.

In addition, YCWA is reasonably confident that there is agreement among YCWA and Relicensing Participants on an additional six studies on which YCWA either adopted without modification or adopted with modification all of the changes requested to the studies.

YCWA's has included in the Revised Study Plan one new study (i.e., Study 7.11, Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration) on which Relicensing Participants have not had an opportunity to comment.

As a result, YCWA believes that differences remain on 14 of the studies proposed by YCWA in its Proposed Study Plan. Even though significant progress has been made on most of these studies, there remain one or more unresolved differences. YCWA has attempted to identify below by study the major remaining unresolved differences. *This is YCWA's best effort, but YCWA may have inadvertently misstated a commenter's position, assumed YCWA's change to the study proposal satisfied a commenter's request, or not identified remaining unresolved differences.* For a detailed reply to each request, see Section 3.2.1 of the Revised Study Plan.

Study 1.1 - Channel Morphology Upstream of Englebright Reservoir

NMFS requested YCWA include in the study an estimate of sediment supply and sediment transport capacity under unimpaired conditions. YCWA did not adopt the request because YCWA believes the information would not inform license requirements. Sediment supply prior to dam construction (i.e., unimpaired) is not relevant to this relicensing.

Study 1.2 - Channel Morphology Downstream of Englebright Dam

USFWS requested that YCWA include in the study proposal a discussion on how the study information would be used to develop measures for inclusion in the new license, an assessment of uncontrolled spills over Englebright Dam, assessment of the "unconfined, lowland river reaches," assessment of floodplain and riparian vegetation conditions. YCWA did not adopt the request regarding an effects analysis because the study is designed to develop needed information. Relicensing Participants have expressly stated that they view the relicensing studies as data gathering, not an impacts evaluation, and prefer the study reports provide the study data only. Relicensing Participants said they prefer that an assessment of Project effects not be included in the study, but that each Relicensing Participant is free to conduct its own assessment using the data from the study. YCWA has honored that request in its study proposals.

YCWA has not adopted the request regarding uncontrolled spills because YCWA believes that analysis should include both controlled and uncontrolled spills over Englebright Dam. Specifying only uncontrolled spill effects is unduly limiting.

YCWA has not adopted the requests regarding "unconfined, lowland river reaches" and floodplain and riparian vegetation conditions because these are vague terms and YCWA believes its proposed study adequately addressed these areas. USFWS has not defined what it means by

"unconfined, lowland river reaches" and YCWA's proposed study includes the Yuba River from Englebright Dam to the Feather River, which includes all of the areas accessible to the river from minimum flow up to maximum flood stage. USFWS has not described why this approach is not adequate to meet the study needs.

Study 2.3 - Water Quality

CDFG requested YCWA include in the study one additional general water quality sampling site (on the Middle Yuba River near the Forest Service's Oregon Creek Day Use Area) and four additional bacteria sample sites (on the Middle Yuba River in Our House Diversion Pool and near the Oregon Creek Day Use Area; in Oregon Creek in the Log Cabin Diversion Pool; and in the Yuba River near Lake Francis Road).

YCWA did not adopt the request regarding the general water quality sampling site because YCWA believes Project nexus has not been established. The Forest Service's Oregon Creek Day Use Area is not a Project facility, occurs along a major State highway, was constructed by the Forest Service prior to the Project's construction, is maintained by the Forest Service, is not accessed by a Project road, and is over 2 miles from any Project facility.

YCWA did not adopt the request regarding the bacteria sampling sites because of lack of Project nexus and what YCWA perceives as technical issues. As described above, the Forest Service's Oregon Creek Day Use Area has little Project nexus. Similarly, Project facilities are not in the area of the Lake Francis Road. Technically, without a continuous source, such as a leaking septic system or an out-of-compliance wastewater treatment plant, human-related bacteria would not be discernable in flowing water. None of the four sites have associated septic systems or treatment plants and each have flowing water.

YCWA and the Forest Service have agreed that YCWA will perform recreation surveys at Oregon Creek Day Use Area during the relicensing Recreation Use and Visitor Surveys Study (Study 8.1). If the surveys indicate a Project nexus, YCWA will perform additional data collection, which could include general water quality and bacteria sampling at the day use area.

Study 2.5 – Water Temperature Monitoring

FWN requested YCWA add to the study additional water quality sampling locations in New Bullards Bar Reservoir so that reservoir coldwater pool dynamics can be thoroughly characterized. YCWA did not adopt the request because YCWA believes the level of sampling proposed by YCWA is adequate. FWN did not describe why it thought YCWA's proposal was inadequate or what level of sampling FWN thought would be adequate.

Study 3.1 - Aquatic Macroinvertebrates Upstream of Englebright Reservoir

The Forest Service and CDFG requested that YCWA add seven additional sampling sites, all of which are outside the influence of the Project, as "reference" sites. YCWA has not adopted the request because YCWA's believes its proposed sampling protocol, the SWRCB's Surface Water Ambient Monitoring Program (SWAMP), to which the Forest Service and CDFG agreed, develops a site-specific index, which is based on a ranking of the site to all other sites embedded in the index. The index identifies if impairment exists at the sampled site and, if so, the magnitude of the impairment. In addition, YCWA has agreed to compare the SWAMP index for

each site to other indices in the literature as developed by Rehn (2009). Both the SWAMP and Rehn indices indicate if a site is impaired and, if so, in what way. Therefore, additional reference sites are not needed.

Study 3.2 - Aquatic Macroinvertebrates Downstream of Englebright Dam

USFWS requested YCWA apply the modifications requested by CDFG to YCWA's Aquatic Macroinvertebrates Upstream of Englebright Dam (Study 3.1) to YCWA's Aquatic Macroinvertebrates Downstream of Englebright Reservoir (Study 3.2). YCWA has not adopted the request because the methods in the two studies are not comparable. The upstream study uses the SWRCB's SWAMP protocol, which is specific to wadeable streams. Because the Yuba River downstream of Englebright Dam is not wadeable, YCWA proposed a large river bioassessment protocol that is a standard method for streams that cannot be waded.

Study 3.6 - Special-Status Turtles – Western Pond Turtle

The Forest Service and CDFG requested YCWA add two stream reaches upstream of the Project as reference reaches, and collect data related to potential entrainment of WPT into the Lohman Ridge and Camptonville tunnels. YCWA has not adopted the request regarding reference reaches because YCWA believes interpreting data from areas outside of Project influence would be significantly confounded by differences in stream geomorphology and variability and in historical and current anthropogenic factors such as mining, recreation, residential development, and introduced species. It is unclear how Project effects could be isolated and apportioned relative to these other factors.

YCWA has not adopted the request regarding entrainment data collection because YCWA believes there is no evidence to suggest that WPT populations are affected by entrainment into Project diversions.

Nevertheless, as described in Study 3.11 below, at the August 10, 2011 Relicensing Participants meeting, YCWA, the Forest Service and CDFG agreed to continue discussing technical approaches to entrainment monitoring at the intakes to the Lohman Ridge and Camptonville diversion tunnels. This discussion will include the potential for including WPT in the study. YCWA will keep FERC apprised of these discussions.

Study 3.9 - Non-ESA Listed Fish Populations Downstream of Englebright Dam

CDFG requested that YCWA add Forest Service Sensitive species to the list of special-status fish species. YCWA has not adopted the request because YCWA believes such a distinction has no value. National Forest System land does not occur in the Yuba River downstream of Englebright Dam in the study area.

Study 3.10 - Instream Flow Upstream of Englebright Reservoir

USFWS requested YCWA perform the study using a 2D model rather than 1D model and that logistic regression be used to develop habitat suitability criteria (HSC), rather than using existing HSC. YCWA has not adopted the request to use a 2D model or develop new HSC using logistic regression. YCWA believes use of a 1D Physical Habitat Simulation (PHABSIM) model and existing HSC to perform instream flow studies is an accepted scientific practice in relicensing

and will provide the needed information. USFWS has not explained why the 1D model or existing HSC would not provide adequate information.

Study 3.11 – Fish Entrainment

The Forest Service and CDFG requested YCWA include WPT as a species to be monitored in the study, and use DIDSON™ acoustic camera near reservoir intakes and Passive Integrated Transponder (PIT) tags near riverine diversions to determine the rate of fish entrainment. YCWA did not adopt the request regarding WPT for the reasons described under Study 3.6 above. YCWA did not adopt the use of acoustic cameras or PIT tags due to what YCWA believes to be significant technical difficulties employing these methods at the Project diversion intakes or outlets. Further, YCWA believes that the risk of entrainment is very low at reservoir intakes and there has not been sufficient data presented to warrant an entrainment assessment.

Besides the methods described above, YCWA has investigated the potential to conduct a fyke netting survey at the diversion tunnel intakes and outlets. Results from the preliminary logistical evaluation showed that the methods would be expensive (>$1 million) and would not operate appropriately, if at all, at high flows (>750 cfs) or low flows (<100 cfs). These operational limitations would limit or preclude monitoring for 25 to 30 percent of the study period.

Given these limitations, YCWA believes its phased approach is more reasonable. If data collected in the first year of sampling indicates entrainment may be a significant impact, a focused study, that may include expensive options, can be implemented in the second year of study.

Nevertheless, at the August 10, 2011 Relicensing Participants meeting, YCWA, the Forest Service and CDFG agreed to continue discussing technical approaches to entrainment monitoring at the riverine intakes to the Lohman Ridge and Camptonville diversion tunnels. YCWA will keep FERC apprised of these discussions.

Study 6.1 - Riparian Habitat Upstream of Englebright Reservoir

FWN requests that YCWA model riparian woody species' response to unimpaired and impaired streamflows. YCWA has not adopted this request because FWN has not shown that YCWA's proposed study does not meet the stated information needs or justified the level of effort and cost to collect the requested information (Study Criterion 7). YCWA will include channel morphology cross-sectional relationships to bankfull and floodprone, and to woody riparian vegetation, as described in Study 6.1 Riparian Habitat Upstream of Englebright Reservoir, Section 5.3.3.

In addition, FWN has not shown the nexus between the Project and unimpaired (or pre-project) conditions for the purpose of Study 6.1 Riparian Habitat Upstream of Englebright Reservoir. Study goals are to evaluate current conditions and do not include comparison with pre-project conditions.

Study 7.2 - Narrows 2 Powerhouse Intake

USFWS requested that YCWA analyze the effect of changing the accessibility of the Narrows 2 Power Tunnel intake structure for downstream passage of *Oncorhynchus mykiss,* and CDFG

requested that YCWA state that the study would proceed to Step 2 (Develop Conceptual Designs) unless all Relicensing Participants collaboratively agreed that the existing Narrows 2 intake structure is adequate to meet all operational and temperature management scenarios. YCWA did not adopt USFWS's request because YCWA believes the request would not provide any useful information. As an essential component of its life history, rainbow trout do not migrate downstream and steelhead do not occur upstream of Englebright Dam.

YCWA did not adopt CDFG's request because YCWA believed it to be impractical. Step 1 in YCWA's study proposal states that Step 2 will not be implemented if it is determined that the existing Narrows 2 intake structure can be used to meet the water temperature targets. If the existing structure can be used to meet targets, there is no reason to proceed to Step 2. CDFG's requested modification is impractical because no structure can meet all operational and temperature management scenarios (i.e., a Relicensing Participant could put forward a target that is generally unreasonable but is, nevertheless, a target).

Study 7.8 – ESA/CESA Listed Salmonids Downstream of Englebright Dam

USFWS requested YCWA address in the study the effects of the Project on the downstream migration of *O. mykiss*, and NMFS requested YCWA address in the study how NMFS's resource management goals and objectives would be met or how Project effects would be evaluated. YCWA has not adopted USFWS's request because YCWA believes the information is available from the suite of downstream relicensing studies. The only Project facility that is a potential physical barrier to upstream fish movement is Narrows 2 Powerhouse, and YCWA included a new study (Study 7.11, Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration) in its Revised Study Plan to assess the affect of the powerhouse on anadromous fish movement. Data regarding Project effects on flow and water temperature will be gathered by YCWA's Water Temperature Monitoring and Model studies (Studies 2.5 and 2.6) and Water Balance/Operations Model Study (Study 2.2).

YCWA has not adopted NMFS's request because YCWA believes the information is not a reasonable study request. It is each agency's responsibility to ascertain if its management goals and objectives are met, and at the requests of Relicensing Participants, YCWA's studies generally develop information for each participant to assess Project effects; the studies do not include environmental assessments.

Study 7.10 – Instream Flow Downstream of Englebright Dam

USFWS requested YCWA develop site-specific HSC. YCWA has not adopted the request because YCWA believes it is not needed. YCWA proposes to use existing HSC, which is a common practice in relicensing instream flow studies. USFWS has not described why existing HSC would not provide adequate information.

New Studies Proposed By Others

Four of the commenters on the Proposed Study Plan requested one or more "new" studies (i.e., a study not proposed by YCWA in its Proposed Study Plan). Nine of the new study requests pertained to anadromous fish and fish passage. The remaining two study requests were related to

angling and deer, respectively. Table ES2 lists the requested new studies and the commenter that requested the study.

Table ES2. Requests for new studies.

Effects of the Project and Related Activities on Fish Passage for Anadromous Fish	NMFS
Effects of the Project and Related Activities on Hydrology for Anadromous Fish	NMFS
Effects of the Project and Related Activities on Water Temperature for Anadromous Fish	NMFS
Effects of the Project and Related Activities on Coarse Substrate for Anadromous Fish	NMFS
Effects of the Project and Related Activities on Large Wood and Riparian Habitat for Anadromous Fish	NMFS
Effects of the Project and Related Activities on the Loss of Marine-Derived Nutrients in the Yuba River	NMFS
Anadromous Fish Ecosystem Effects	NMFS
Estimating Downstream Migration of *O. mykiss* in the Yuba River	USFWS
Salmonid Floodplain/Off-Channel Rearing Habitat	USFWS
Angling Study	FWN
Deer Herd Migration Routes and Mule Deer Winter Range Access Assessment	YCFG
Total	**11**

[1] Commenters that said they "supported" a request by another commenter, but did not request any modification to the study in addition to the commenter that requested the study modification or new study, are not listed.

YCWA carefully reviewed each of the requested new studies. A summary of the major differences as perceived by YCWA is below. For a detailed reply to each new study request, see Section 3.2.2 of the Revised Study Plan.

YCWA did not adopt new study requests related to anadromous fish and fish passage for a number of reasons. First, where a new study request pertained to anadromous fish or fish passage upstream of Englebright Dam, YCWA believes the study is not needed. Anadromous fish do not occur upstream of Englebright Dam and, therefore, the information developed by the study would not inform license requirements. If anadromous fish pass upstream of Englebright Dam occurs in the course of the relicensing or such passage becomes reasonably foreseeable during relicensing, appropriate studies can be developed and implemented at that time. In discussions with NMFS, YCWA agreed to include its applicant-prepared draft Biological Assessment conceptual plans for fish passage structures at Project facilities and a schedule for how long it would take to install such structures.

YCWA did not adopt the new studies related to anadromous fish passage at USACE's Englebright Dam. The dam is not a Project facility, but a federal facility.

YCWA did not adopt new study requests as they pertain to anadromous fish downstream of Englebright Dam for two main reasons. First, YCWA believes the majority of the information that would be developed by the requested new studies will be developed in YCWA's proposed relicensing studies. Second, YCWA has included a new study (Study 7.11, Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration) in its Revised Study Plan to assess the effects of the Narrows 2 Powerhouse, the only Project facility downstream of Englebright Dam, on anadromous fish movement. This study includes for Narrows 2 Powerhouse many of the components in the requested new studies.

YCWA did not adopt the requested Angling Study because YCWA believes the requested information will be available from YCWA's Recreation Use and Visitor Surveys Study (Study 8.1).

YCWA did not adopt the requested Deer Herd Migration Routes and Mule Deer Winter Range Access Assessment because YCWA believes the purpose of the study is to address effects that may have occurred when the Project was initially constructed. Relicensing focuses on existing conditions as the baseline for environmental analysis.

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List of Redlined Study Proposals in Appendix 2

Study No.	Description
1.1	Channel Morphology Upstream of Englebright Reservoir
1.2	Channel Morphology Below Englebright Reservoir
2.1	Hydrologic Alteration
2.2	Water Balance/Operations Model
2.3	Water Quality
2.4	Bioaccumulation
2.5	Water Temperature Modeling
2.6	Water Temperature Model
3.1	Aquatic Macroinvertebrates Upstream of Englebright Reservoir

List of Redlined Study Proposals in Appendix 2 (continued)

Study No.	Description
3.2	Aquatic Macroinvertebrates Downstream of Englebright Reservoir
3.3	Special-Status Mollusks
3.4	Special-Status Amphibians – Foothill Yellow-Legged Frog Surveys
3.5	Special-Status Amphibians – Foothill Yellow-Legged Frog Habitat Modeling
3.6	Special-Status Turtles – Western Pond Turtle
3.7	Reservoir Fish Populations
3.8	Stream Fish Populations
3.9	Non-ESA Listed Fish Populations Downstream of Englebright Dam
3.10	Instream Flow Above Englebright Reservoir
3.11	Fish Entrainment
4.1	Special-Status Wildlife – California Wildlife Habitat Relationships
4.2	Special-Status Wildlife – Bats
5.1	Special-Status Plants
6.1	Riparian Habitat Upstream of Englebright Reservoir
6.2	Riparian Habitat Downstream of Englebright Dam
6.3	Wetlands
7.1	Endangered Species Act – Listed Plants
7.2	Potential Narrows 2 Powerhouse Intake Extension
7.3	ESA-Listed Amphibians – California Red-Legged Frog
7.4	ESA-Listed Elderberry Longhorn Beetle
7.5	California Endangered Species Act – Listed Plants
7.6	CESA-Listed and Fully Protected Wildlife – California Wildlife Habitat Relationships
7.7	CESA-Listed Wildlife – Bald Eagle
7.8	ESA/CESA-Listed Salmonids Downstream of Englebright Dam
7.9	Green Sturgeon Downstream of Englebright Dam
7.10	Instream Flow Downstream of Englebright Dam
8.1	Recreation Use and Visitor Surveys
8.2	Recreation Flow
9.1	Primary Project Roads and Trails
10.1	Visual Quality on Federal Land
12.1	Historic Properties
13.1	Native American Traditional Cultural Properties

GLOSSARY
DEFINITION OF COMMONLY USED TERMS, ACRONYMS, AND ABBREVIATIONS

Term	Definition
A	
ac-ft	acre-feet or acre-foot, the amount of water needed to cover one acre to a depth of one foot (43,560 cubic feet or 325,900 gallons)
accretion flow	The incremental flow between two points. Also known as local inflow.
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
adit	An almost vertical pipe or short horizontal passage entering a tunnel, either to add water from a conduit, sluice or other water source, or as a maintenance access tunnel (also referred to as a portal)
aestivation	Similar to hibernation, where an animal is dormant during unfavorable summer-like conditions. For example, to survive long periods of drought, some reptiles and amphibians become inactive or "aestivate."
AFRP	Anadromous Fish Restoration Program
afterbay	A reservoir located immediately downstream from a powerhouse, sometimes used to re-regulate flows to the river or stream
anabat	An electronic instrument used to detect and record high frequency vocalization of bats
anadromous	Anadromous fish live most of their lives in saltwater and return to freshwater to spawn.
ancillary	Provides added support
APE	Area of Potential Effect, as pertaining to Section 106 of the National Historic Preservation Act
AW	American Whitewater
B	
BA	Biological Assessment
Basin Plan	Basin Plans provide the basis for protecting water quality in California. Basin Plans are mandated by both the Federal Clean Water Act and the State Porter-Cologne Water Quality Act. Sections 13240-13247 of Porter-Cologne specify the required contents of a regional basin plan. For a given region, each plan contains 1) water quality objectives to ensure the reasonable protection of beneficial uses and 2) a program of implementation for achieving those objectives.
Bay-Delta	The San Francisco Bay-San Joaquin Delta Estuary
BLM	United States Department of the Interior, Bureau of Land Management
BMI	benthic macroinvertebrates
BO	Biological Opinion
BOR	United States Department of the Interior, Bureau of Reclamation
bypass flow	Bypass flows are those flows that are required to be released into a stream, and do not flow through the powerhouse
C	
°C	Centigrade
CALFED	Interagency committee with management and regulatory responsibility for Bay-Delta Estuary
CalVeg	Classification and Assessment with Landsat of Visible Ecological Groupings. The Forest Service's classification system of California's existing vegetation communities. Original information was collected using remote sensing techniques along with field verification.
CAS	California Academy of Sciences
CRLF	California red-legged frog
Cal-IPC	California Invasive Plant Council
CalTrans	California Department of Transportation
CD	Compact Disc
CDBAW	California Department of Boating and Waterways
CDEC	California Data Exchange Center
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDPR	California Department of Parks and Recreation
CDWR	California Department of Water Resources
CE	Federal Candidate Endangered Species. A species or subspecies listed as endangered under the California Endangered Species Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act

Glossary (continued)

Term	Definition
C (continued)	
CFBF	California Farm Bureau Federation
CFR	Code of Federal Regulations
cf or ft^3	cubic feet
cfs	cubic feet per second. One cfs equals approximately 1.98 acre-feet per day.
CHRIS	California Historical Resources Information Center
cm	centimeter
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
Commission	Federal Energy Regulatory Commission; also referred to as FERC
component	A named data set in an operation model that is a building block for a condition.
Conjunctive use	Conjunctive use of surface and groundwater consists of combining the use of both water sources in order to (1) minimize the undesirable physical, environmental and economical effects of using each and (2) optimize the water demand/supply balance.
Consumptive use of water	Water no longer available for use because it has evaporated, transpired, or has been incorporated into products and crops.
Conceptual design for recreation facilities	A conceptual design is the designer's initial communication to convey proposed design solutions. Conceptual designs for a facility may consist of diagrammatic sketches, bubble diagrams, line diagrams, preliminary floor plans, or renderings. A conceptual design is prepared prior to a site development plan. (Forest Service Handbook 7309.11, Chapter 30.)
condition	The main building block of a scenario, containing the data used by the operation model to simulate the system. At this time, the only condition that is defined by components is 'Turbine Generator'.
Conduit	A pipe, flume or canal used for diverting or moving water from one point to another, usually used when there is no existing streambed or waterway.
Contact List	List of Interested Parties that have provided an e-mail address to the Licensee for distribution of information regarding the Relicensing. Also referred to as Relicensing Contact List.
Critical Habitat	Areas of land or water that the United States Fish and Wildlife Service or National Marine Fisheries Service has designated to have the physical or biological features essential to the conservation of a species listed under the federal Endangered Species Act.
CSC	California Special Concern Species, an administrative designation by CDFG
CT	Federal Candidate Threatened Species. A species or subspecies listed as threatened under the California Endangered Species Act
cu yd	cubic yard
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Federal Clean Water Act
CWHR	California Wildlife Habitat Relationships System
CWT	coded wire tags
D	
Dam fish release requirement	The flow that must be released to the stream downstream of the dam; also known as minimum streamflow release requirement or bypass flow.
Dam Slope – Upstream Face	The slope of the upstream face of the dam.
Dam Slope – Downstream Face	The slope of the downstream face of the dam.
Dam Spillway Control	The type of device that controls the spillway.
Dam Spillway Crest Elevation	The elevation of the lowest point of the spillway.
Dam Spillway Type	The type of spillway.
Dam Type	A description of the type of dam.
Dam Year Placed in Service	The first calendar year water was impounded behind the dam.
dbh	diameter at breast height
DEM	Digital Elevation Model – The format of the USGS digital elevation data sets containing elevation values that have been primarily derived from the United States Geological Survey topographic map series.
Development	The Project facilities situated immediately upstream of a powerhouse, which are not part of another development.
Discharge	water released from a dam
distribution system	The substations, transformers and lines that convey electricity from high-power transmission lines to the consumer. Usually 115 kV and lower voltage.
Diversion dam	Generally a small dam with minimal storage and a primary purpose of routing a portion of upstream flow into a diversion conduit.
DLA	Draft License Application
DO	dissolved oxygen
DOC	dissolved organic carbon
DPS	distinct population segment
Draft EA	Draft Environmental Assessment

Glossary (continued)

Term	Definition
D (continued)	
DEIR	Draft Environmental Impact Report
DSS	The United States Army Corps of Engineers' Hydrologic Engineering Center Data Storage System is a database system designed to store and retrieve scientific data.
DVD	Digital Versatile Disk
E	
EA	Environmental Assessment
EAP	Emergency Action Plan
ECPA	Electric Consumers Protection Act
EDR	Englebright Dam Reach
EFH	Essential Fish Habitat
EIA	Energy Information Administration
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
El.	Elevation
endemic (adj.) endemism (noun)	Restricted to a certain locality or region. Indigenous. Native.
EPA	United States Environmental Protection Agency
EPT	Orders of benthic insects: Ephemeroptera, Plecoptera, and Tricoptera.
ESA	Federal Endangered Species Act
ESU	evolutionarily significant unit
EVC	existing visual condition
F	
°F	Fahrenheit
FC	Federal Candidate Species. A species or subspecies currently proposed as a candidate for listing under the ESA
FE	Federal Endangered Species. A species or subspecies listed as endangered under the Federal Endangered Species Act
FEA	Final Environmental Assessment
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FEPD	A federally-listed endangered species currently proposed for delisting from the ESA
FERC	Federal Energy Regulatory Commission
FERC determination	A binding decision made by FERC during the relicensing process
FERC Project Boundary	The area Licensee uses for normal Project operations and maintenance, and is shown on Exhibits G, J, and K of the current license.
FGDC	Federal Geographic Data Committee: promotes the coordinated development, use, sharing, and dissemination of geographic data.
FHSA	Federal Historic Sites Act
FHWA	Federal Highway Administration
fishway	A structure on or around natural or artificial barriers to facilitate fish migration, such as a fish ladder.
flashboards	Removable boards installed seasonally in reservoir spillways to temporarily increase storage capacity
flood elevation	The reservoir elevation at which the plant's reservoir spills.
FLPMA	Federal Land Policy and Management Act
flume	A lined structure, commonly made of wood, metal or concrete, used for conveyance of water, usually where no streambed exists or the topography is not suitable for a canal or tunnel.
FMP	Fire Management Plan
FMU	Fire Management Unit
forebay	A reservoir upstream from the powerhouse from which water is drawn into a tunnel or penstock for delivery to the powerhouse
Forest Service	United States Department of Agriculture, Forest Service
FP	Fully Protected. A species or subspecies designated as "fully protected" under the California Department of Fish and Game Code
FPA	Federal Power Act
FPD	Federal Proposed Delisting. A species or subspecies proposed for listing as endangered under the federal Endangered Species Act.
FPE	Federal Proposed Endangered. A species proposed for listing as "endangered" under the federal Endangered Species Act.
Fps	feet per second
FPT	Federal Proposed Threatened. A species or subspecies proposed for listing as threatened under the federal Endangered Species Act.
FSS	Forest Service Sensitive. A species or subspecies designated as "sensitive" by the Forest Service

Glossary (continued)

Term	Definition
F (continued)	
FT	Federal Threatened Species. A species or subspecies listed as threatened under the Federal Endangered Species Act
Ft	foot or feet
FYLF	Foothill yellow-legged frog
G	
G	Giga
g	Gram
GAP	Gap Analysis Program. United States Geological Survey and UC Santa Barbara's vegetation, land cover, and potential wildlife habitat map(s) for California.
Generator	A machine, powered by a turbine that converts the rotating mechanical energy into electrical energy.
GIS	Geographic Information System
GMP	General Management Plan
gpd	gallons per day
gpm	gallons per minute
GPS	Global Positioning System
H	
H	Horizontal
HA	Commercially or recreationally harvested species; non-protected species.
HABS	Historic American Building Survey
HABTAT	United States Fish and Wildlife Service Instream Flow Incremental Methodology simulation model
HAER	Historic American Engineering Record
HCP	Habitat Conservation Plan
head	The vertical height of water that represents potential energy.
Headwater	The upper tributaries that form the source of a stream
head loss	The amount of head that is lost (to friction, etc.) between the headwater (reservoir/forebay/intake) and the tailwater.
HEC	Hydrologic Engineering Center of the United States Army Corps of Engineers
HEC-ResSim	United States Army Corps of Engineers – Hydrologic Engineering Center Reservoir Simulation model, Version 3.0. Also referred to as ResSim.
HEP	Habitat Evaluation Procedures
HLCTS	Hydropower License Compliance Tracking System
hp	Horsepower
HPMP	Historic Properties Management Plan
hr	Hour
HSC	Habitat Suitability Criteria
HSI	Habitat Suitability Indices
HSPH	Hydrologic Simulation Program—Fortran
HU	Hydro unit, numbers assigned by California's regional water quality control boards.
HUC	Hydrologic unit codes developed by the Water Resources Council corresponding to hierarchal classification of hydrologic drainage basins in the United States. Each hydrologic unit is identified by a unique HUC.
Hz	Hertz (cycles per second)
I	
IFIM	United States Fish and Wildlife Service, Instream Flow Incremental Methodology
IHA	Indicators of Hydrologic Alteration
ILP	Integrated Licensing Process
in	Inch
inflow	The water entering a reservoir.
Initial License	The first license for a Project issued by Federal Energy Regulatory Commission.
Installed capacity	Installed capacity refers to the maximum amount of electric energy, in megawatts, that can be produced by all of a dam's turbines operating to their maximum capacity for a given time. No power station ever produces at maximum capacity over a sustained period of time due to maintenance needs, lack of demand or, in the case of hydro dams, lack of water. Also called nameplate capacity or maximum capacity.
Interchange	Electric power that flows from one entity to another.
Interested Parties	All governmental agencies, non-governmental organizations, Native American tribes, and unaffiliated members of the public who either (1) routinely participate in Federal Energy Regulatory Commission relicensings in California or (2) have advised the Licensee that they wish to become involved in one or more of the relicensing proceedings. The Licensee is considered to be an Interested Party.
introgression	The introduction of genes from one species into the gene pool of another species.

Glossary (continued)

Term	Definition
I (continued)	
Inverted siphon	A pressurized pipe section of conduit that crosses a stream channel or ravine.
ISO	Independent System Operator
ITA	Indian Trust Asset
J	
K	
kg	kilogram: 1,000 grams
kg/day	kilograms per day
kg/ha	kilograms per hectare
kg/yr	kilograms per year
km	kilometer: 1,000 meters
kV	kilovolt: 1,000 volts
kVA	kilovolt amperes
kW	kilowatt: 1,000 watts
kWh	kilowatt-hour: 1,000 watt hours
L	
L	liter
lb	pound
Lead Agency	A lead agency is the agency responsible for ensuring that a course-of-action, i.e., project, complies with the California Environmental Quality Act and/or the National Environmental Policy Act.
Lentic	Related to or living in standing water.
License Application	Application for a new license; submitted to the Federal Energy Regulatory Commission no less than two years in advance of expiration of an existing license.
Licensee	Yuba County Water Agency
license term	The period for which a license is issued by the Federal Energy Regulatory Commission. Usually between 30 and 50 years.
LiDAR	Light Detection and Ranging. An optical remote sensing technology that measures properties of scattered light to find range and/or other information of a distant target.
load shapes	The daily schedule of power pricing and the hour duration of each price.
local inflow	The incremental inflow between two plants (also known as accretion flows).
LOP	limited operating periods
lotic	Related to or living in flowing water.
LRMP	Land and Resource Management Plan
LWD	large woody debris
M	
µ	micro
µg	microgram
µg/L	micrograms per liter (equals parts per billion, or ppb)
µmho/cm	micromhos per centimeter, a measurement of electrical conductivity
µS	microsiemens, a measurement of electrical conductivity
M	mega
m	meter (if the letter is used as a unit on its own)
m	milli (if the letter is placed in front of another unit)
mainstem powerhouse	A plant located on the main stream that runs through the system. Not a plant on a side or tributary stream.
maximum penstock velocity	The maximum velocity in the penstock at the "installed capacity" as defined above. This will occur at the smallest penstock diameter.
mbf	million board feet
MBTA	Migratory Bird Treaty Act
MCA/T	mandatory conditioning agencies/tribes
MCL	maximum contaminant level
Meeting Participant	A Relicensing Participant who attends a specific meeting. Meeting Participants are different for each meeting.
Member Unit	One of eight water users who participated in the Yuba Accord with YCWA.
metadata	"Data about data" - Describe the content, quality, condition, purpose and other characteristics of data.
mg	milligram
mg/L	milligrams per liter (equals parts per million, or ppm)
mgC/m^2	milligrams of carbon per square meter
mi	mile
mills/kWh	0.1 cent per kilowatt hour
minimum daily average flow	A requirement indicating the minimum flow of water that must be maintained at a measurement location when instantaneous flow measurements are averaged on a daily basis.

Glossary (continued)

Term	Definition
M (continued)	
minimum instantaneous flow	A requirement indicating the minimum flow of water that must be maintained at a measurement location at any point in time.
minimum instream flow	A requirement indicating the minimum flow within a Project-affected reach, at a fixed measurement location. A minimum instream flow can be defined as an instantaneous flow or a time period-averaged flow.
MIR	minimal implementation requirement, a Forest Service system
MIS	A Forest Service Management Indicator Species
mm	millimeters
MNBMC	Migratory Bird of Management Concern, a Forest Service classification
morphometric	measurement of the external form (size and shape) of an object
MOU	memorandum of understanding
MPN	most probable number
mps	meters per second
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MVA	megavolt-ampere
MVZ	Museum of Vertebrate Zoology
MW	megawatt: 1,000 killowatts
MWh	megawatt-hours: 1,000 killowatt-hours
MYR	Middle Yuba River
N	
n	nano
NAD 83	North American Datum 1983 – Based on a definition of the size and shape of the earth. It is the datum for map projections and coordinates within the United States and throughout North America.
NAGPRA	Native American Graves Protection and Reparation Act
NADV	North American Vertical Datum
NAHC	California Native American Heritage Commission
NAIP	National Agriculture Imagery Program
Narrows 1 Powerhouse	PG&E's powerhouse located on the south side of the Yuba River below Englebright Dam.
Narrows 2 Powerhouse	YCWA's powerhouse located on the north side of the Yuba River below Englebright Dam.
natal	Of, relating to, or present at birth.
natural inflow	The flow that a point in the system would have received if there were no upstream flow regulation in the system. This flow is equal to the sum of all upstream accretion inflows. Also known as unimpaired or unregulated flows.
NCCP	Natural Conservation Plan
NCIC	North Central Information Center
NEPA	National Environmental Policy Act
NEPAct	National Energy Policy Act
New License	A license issued for a Project for which the Federal Energy Regulatory Commission has issued an initial license
NFMA	National Forest Management Act
NFS	National Forest Service
ng	nanogram
NGO	Non-Governmental Organizations
NGVD	National Geodetic Vertical Datum
NHA	National Hydropower Association
NHI	Natural Heritage Institute
NHPA	National Historic Preservation Act
NID	Nevada Irrigation District
NLT	No later than
NMFS	Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NMWS	Normal Maximum Water Surface elevation (applies to reservoirs and impoundments)
NOAA	Department of Commerce, National Oceanic and Atmospheric Administration
normal operating capacity	The maximum MW output of a generator or group of generators under normal maximum head and flow conditions
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NPN	Neuns-Ponto-Neer association, a soils classification
NPS	National Park Service
NRCS	Natural Resource Conservation Act
NRHP	National Register of Historical Places

Glossary (continued)

Term	Definition
N (continued)	
NRI	Nationwide Rivers Inventory
NTU	nephelometric turbidity unit
NWI	National Wetlands Inventory
NWIS	United States Geological Survey's National Water Information System
NYI	North Yuba Index
NYR	North Yuba River
O	
O&M	Operation and maintenance
OEHHA	California's Office of Environmental Health Hazard Assessment
OEP	Federal Energy Regulatory Commission Office of Energy Projects (Formerly Office of Hydropower Licensing)
OHP	State Office of Historic Preservation
OHV	Off Highway Vehicle
Operation and maintenance	The utilization of fixed Project assets for their intended use, as well as any ongoing, repetitive tasks associated with keeping fixed Project assets in acceptable condition, including safety inspections.
ORV	Off-road vehicle ***or*** Outstanding Remarkable Views
P	
P	phosphorus
PAC	Protected activity center
PAD	Pre-Application Document
PAD Questionnaire	Questionnaire developed and circulated by Yuba County Water Agency to gather existing, relevant and reasonably available information for inclusion in the Yuba River Development Project Pre-Application Document.
PAOT	people at one time
PDF	Portable document format
peaking	Operation of generating facilities to meet maximum instantaneous electrical demands
penstock	An inclined pipe through which water flows from a forebay or tunnel to the powerhouse turbine
penstock length	The length of the penstock (see definition for penstock, above) from the tunnel or upstream inlet to the turbine shut off valve
penstock supports	The type of supports for the penstock.
penstock type	A description of the type of pipe and whether the pipe is surface or buried.
PFMC	Pacific Fishery Management Council
PG&E	Pacific Gas and Electric Company
PH	Powerhouse
pH	The measure of the acidity or alkalinity of a substance or liquid
PHABSIM	Physical Habitat Simulation Models
Plan	A common term for a County's general plan.
PLP	Preliminary Licensing Proposal
PM&E	Protection, Mitigation & Enhancement
PM&E measure	A Project facility, operation or management activity undertaken for the purpose of protecting or mitigating impacts that would result from continued Project operation and maintenance, or for the purpose of enhancing resources that would be affected by continued Project operation and maintenance.
PNF	Plumas National Forest
power development	See "development"
Powerhouse operation type	A reference to the manner in which water is scheduled though a powerhouse. At this time there are six operating types: Diversion Powerhouse – A powerhouse that utilizes upstream diversions with minimal storage. Fill and Spill – A powerhouse that peaks with the loadshape but gives priority to the upstream powerhouse and will spill in order for the upstream powerhouse to follow the loadshape as closely as possible. Strictly Peaking - A powerhouse that peaks its discharge. Attempts to schedule water in highest value periods of day. Can instantaneously (in a 15-minute increment) change load. Peaking with Ramp Rates – A powerhouse where the water discharge still closely follows the load shape (powerhouse will Peak); however, the powerhouse is constrained by ramping rates. Pure Run of River – A powerhouse where inflows are equal to outflows on an instantaneous basis. Re-regulating – A powerhouse designed to regulate peaked discharge from upstream powerhouses into smoother discharges. This powerhouse releases constant outflows for the whole day. Re-regulating powerhouses may or may not be constrained by ramping rates.
powerhouse maximum capability	Maximum megawatt output generated by the specific powerhouse. For powerhouses with two or more units, this value is the maximum simultaneous total output generated.

Glossary (continued)

Term	Definition
P (continued)	
ppb	parts per billion
PPL	Pit-Pastolla-Lasvar association, a soils classification
ppm	parts per million, equals mg/L
Program	CALFED Bay-Delta Program
Preliminary Information Package	A document issued by YCWA in 2009 to prepare Relicensing Participants for formal relicensing.
Project	YCWA's Yuba River Development Project, FERC Project No. 2246. Specifically, the Project facilities and features identified in the existing FERC license.
Project Area	The area within the FERC Project Boundary and the land immediately surrounding the FERC Project Boundary (i.e., within about 0.25 mile of the FERC Project Boundary) and including Project-affected reaches between facilities and downstream to the next major water controlling feature or structure.
Project Drainage Basins	Combination of the Middle Yuba River, North Yuba River and Yuba River drainage basins.
Project Region	The area surrounding the Project in the order of a county or national forest.
Project Roads	Roads within Project boundary and constructed for Project purposes and necessary for Project operation and maintenance
Project Vicinity	The area surrounding the Project on the order of a United States Geological Survey 1:24,000 topographic quadrangle.
Project Viewshed	The area from which Project features are visible. The land base from which the Project may be seen.
Project Works	All of the infrastructure associated with the operations of the Project
PWC	Personal water craft
Q	
QA/QC	Quality Assurance/Quality Control
quad	Quadrangle
R	
ramping	The act of increasing or decreasing stream flows from a powerhouse, dam or diversion structure
ramping rates	The rate of water discharge from a powerhouse, dam or diversion structure, prescribed by the License or other regulatory-driven rule.
ramping rate curve	The river flow vs. stage curve relationship at the point where ramping rate compliance is measured.
RD	Recreation Day, which equals a visit by a person to a site for recreation purposes during any portion of a 24-hour period
Reach	A stretch of stream defined for the purposes of communication, usually defined between readily identifiable endpoints (such as structures or stream confluence).
REC	Sierra Foothill Research and Extension Center
Regulated hydrology	The hydrology of Project-affected streams subsequent to construction of the Project. The hydrology of any stream that is augmented, constrained, or otherwise manipulated by upstream man-made structures.
Relicensing	The process of acquiring a new license for a Project that has an existing license from the Federal Energy Regulatory Commission.
Relicensing Contact List	List of Interested Parties that have provided to YCWA an e-mail address to which YCWA may forward information regarding the Relicensing. Also referred to as Contact List.
Relicensing Participants	Interested Parties, which includes YCWA, that routinely actively take part (i.e., attend meetings/workshops and make filings) in the Relicensing proceedings
relicensing proceeding	Relicensing of YCWA's Yuba River Development. Sometimes referred to as the Relicensing.
reservoir	The water retained by a dam. Also referred to as headwater, storage, forebay, or headpond.
reservoir drainage area	The area that drains into the reservoir.
reservoir elevation	The water surface elevation of a reservoir at a given point in time
reservoir gross storage	Reservoir storage at maximum normal water surface elevation.
reservoir length	The distance between the two most distant points on the reservoir shore at normal maximum water surface elevation.
reservoir maximum storage capacity	The gross volume of water that can be stored in the reservoir.
reservoir NMWS elevation	Normal Maximum Water Surface - The elevation of the lowest spill crest if uncontrolled, the top of the gates for gates at the top of the dam.
reservoir surface area	The surface area of the reservoir at the normal maximum water surface elevation.
reservoir storage curve	A curve that defines a reservoir's volume in acre-ft at various surface elevations.
reservoir usable capacity	A volume measurement of the amount of water that can be stored for generation, down to a minimum level
reservoir width	The maximum distance between the two most distant points on the reservoir shore at normal maximum water surface elevation taken at a right angle to the line at reservoir length.
residence time	The period of time water remains in a reservoir.
ResSim	United States Army Corps of Engineers - Hydrologic Engineering Center (USACE-HEC) Reservoir Simulation model, Version 3.0. Also known as HEC-ResSim.

Glossary (continued)

Term	Definition
R (continued)	
Responsible Agency	A responsible agency is a public agency with discretionary approval authority over a portion of a project that is subject to the California Environmental Quality Act.
riparian	Riparian applies to the vegetation zone and other biological resources adjacent to and hydrologically affected by neighboring riverine (lotic) and reservoir (lentic) water bodies.
RM	River mile as measured along the river course, from downstream to upstream, often beginning at a downstream confluence with another river reach.
RMT	Yuba Accord's River Management Team
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
Rosgen classification	The Rosgen classification system is a widely-used method for classifying streams and rivers based on common patterns of channel formation (morphology). The patterns are preferably observed from physical measurements.
RST	Rotary Screw Traps
RTD	resistance temperature detector
run-of-the-river	A hydro project that uses the flow of a stream with little or no reservoir capacity for storing water
RV	recreational vehicle
RVD	Recreation Visitor Days
RWQCB	Regional Water Quality Control Board
S	
salmonids	Any member of the taxonomic family Salmonidae, which includes all species of salmon, trout, char, whitefish, and grayling.
SCADA	Supervisory Control And Data Acquisition system
scenario	A collection of settings that constitutes a HEC-ResSim operation model run. Output data for a run are referenced by the scenario name.
SD1	Scoping Document 1: A document issued by the Federal Energy Regulatory Commission summarizing the relicensing process for a Project; generally issued following the first public meeting after the NOI.
SD2	Scoping Document 2: Within 45 days following the deadline for filing of comments on Scoping Document 1, the Federal Energy Regulatory Commission staff shall, if necessary, issue Scoping Document 2 to address comments received regarding Scoping Document 1.
SE	State Endangered. A species or subspecies listed as endangered under the California Endangered Species Act.
Secchi Disc	A method of measuring surface water transparency in a reservoir
§ or §§	Section or sections
Section 106	Refers to section 106 of the National Historic Preservation Act
Section 401 Certification	Water quality certification issued by the State Water Resource Control Board, the California agency responsible for administering Section 401 of the Clean Water Act
Section 7 Consultation	The required formal consultation required under the Endangered Species Act between the Licensee and the United States Fish and Wildlife Service and/or the National Marine Fisheries Service.
SFP	State fully protected
SFWPA	South Feather Water and Power Agency
SHPO	California Department of Parks and Recreation, Office of Historic Preservation, State Historic Preservation Officer
Smartville	In 2008, the people of this community petitioned to have the name changed to Smartsville, with an 's" in the middle of the name. However, the USGS gage refers to the former spelling of the community name. Therefore in this document, the community is referred to as such.
SNFPA	Sierra Nevada Forest Plan Amendment
SNYLF	Sierra Nevada yellow-legged frog
Special-Status Species	Special status species or subspecies are listed under the California Endangered Species Act, federal Endangered Species Act, resource agency, or resource trustee, as candidates for endangered or threatened status, species of special concern, sensitive species, watch list species, management indicator species, or rare species.
Spill	Water that passes over a spillway or dam without being utilized for power generation.
Spillway	A constructed passage for releasing surplus water from a reservoir or release water, not used for power generation, as otherwise necessary for safe project operation
spillway capacity curve	A curve that defines the magnitude of spill, in cubic feet per second, for the spillway at given reservoir elevations.
SPT	sediment pass-through
sq ft or ft^2	square foot
sq mi or mi^2	square mile
SR	State Rare. A species or subspecies listed as rare under the California Environmental Quality Act.
SRMA	Sierra Resource Management Area
SRMP	Sierra Resource Management Plan

Glossary (continued)

Term	Definition
S (continued)	
SRWP	Sacramento River Watershed Program
ST	State Threatened. A species or subspecies listed as threatened under the California Environmental Quality Act.
Stage	A water surface elevation based on a local datum
State	State of California
station use	Energy used to operate the generating facility's auxiliary equipment
STATSGO	State Soil Geographic Database
stoplogs	Removable logs installed seasonally in reservoir spillways to temporarily increase storage capacity. Also known as "flashboards".
Storage-area-elevation curve	A rating curve that defines reservoir storage and water surface area as a function of the water surface elevation
Study Area	The geographic area covered by a specific study
Study Plan	The aggregate of all study descriptions
Study Proposal	A single study, as well as the aggregate of all studies performed in support of the relicensing.
su	Standard units; units of measuring PH
sub-basin	An area drained by a stream and all its tributaries that is contained within a larger basin or watershed
SUP	Special Use Permit issued by the Forest Service
switching center	The main control center for the development. The switching center is responsible for operation of the development's automatic, semiautomatic and manual powerhouses.
switchyard	A facility where electricity from the electrical generator is transferred to the electric grid
SWP	State Water Project
SWRCB	State Water Resources Control Board
synthesized hydrology	The calculated estimate of flow (not measured).
SYR	South Yuba River
SYRCL	South Yuba River Citizens League
SYWD	South Yuba Water District
T	
tailrace	Channel through which water is discharged from the powerhouse turbines
taxa	Plural form of taxon.
taxon	A term used in animal and plant classification. One or more organisms that are classified as being members of the same group, related to each other.
TCP	Traditional Cultural Property
TDS	total dissolved solids
T&E	Threatened and Endangered species as listed by either the Federal Endangered Species Act or the California Endangered Species Act.
thalweg	The lowest elevation within the cross-section of a natural or artificial water conveyance channel
TMDL	total maximum daily load
TN	total nitrogen
TNC	The Nature Conservancy
TNF	Tahoe National Forest
TOC	total organic carbon
transformer	An electrical device which modifies the voltage and current relationship of a power source.
trash rack	A mechanism, found on a dam or intake structure, which clears the water of debris before the water passes through the structure
TSS	total suspended solids
tunnel	An underground or underwater passageway
turbine	A machine that converts the energy of moving water into the mechanical energy of rotation. This energy is then used to turn an electrical generator or other device.
U	
UC Davis	University of California, Davis
unimpaired hydrology	Synthesized hydrology of Project-affected streams with no developments. An estimate.
Unit	A term referring to the combined turbine-generator machine.
US	United States
USACE	United States Department of Defense, Army Corps of Engineers
USBLM	United States Department of Interior, Bureau of Land Management
USBR	United States Department of Interior, Bureau of Reclamation
USC	United States Code
USDA	United States Department of Agriculture

Glossary (continued)

Term	Definition
U (continued)	
USDOC	United States Department of Commerce
USDOD	United States Department of Defense
USDOI	United States Department of Interior
USFWS	United States Department of Interior, Fish and Wildlife Service
USGS	United States Department of Interior, Geological Survey
UTM	Universal Transverse Mercator – The map projection upon which the UTM Coordinate System is based.
UYRSP	The Upper Yuba River Studies Program
V	
V	volts
VELB	valley elderberry longhorn beetle
VMS	A Forest Service Visual Management System
W	
W	watt
Watch List	A list prepared by an individual National Forest Land Resource Management Plan of plants and animal species that are locally rare (as opposed to declining throughout their range) and are of public concern, occur as disjunct populations, are newly described taxa, or lacking sufficient information on population size, treats, trends or distribution. These species are not on the federal special status species list.
Water quality certification	Issued by the State Water Resources Control Board in California, but required by the federal Clean Water Act, Section 401 water quality certification is required for any permit or license issued by a federal agency for any activity that may result in a discharge into waters of the state to ensure that the proposed project will not violate state water quality standards.
water withdrawals	Water that is withdrawn from the reservoir, not available for energy generation, which is lost from the system. Withdrawals can be either positive or negative.
Whitewater Classification System	**Class I:** (Easy) Moving water with small disturbances on the surface and a few small waves. There is little to no danger to swimmers. **Class II:** (Novice/Beginner) Faster moving water with easily avoided rocks, holes, and waves. Danger to swimmers is still slight but care must be taken. **Class III:** (Intermediate) Fast moving water containing various rocks, holes, currents, and waves that require skillful maneuvering to avoid. Swimmers could be at risk and may require help. **Class IV:** (Advanced) Strong rapids, large waves, big holes, unpredictable currents, and dangerous obstructions requiring multiple maneuvers to get through or around. Swimmers are at risk and will require help to be rescued. **Class V:** (Expert) All of the characteristics of Class IV with the added danger of being longer and containing more continuous features that may not be avoided. There is serious risk to swimmers and others may be of no help. **Class VI:** (Unrunnable) Only a team of experts who carefully plan every aspect of this expedition would have hope of surviving these rivers and rapids.
WPT	western pond turtle
WSEL	water surface elevation
WSRA	Wild and Scenic Rivers Act
WUA	Weighted Usable Area
WY	water year
X	
Y	
y^3	Cubic yard
YCWA	Yuba County Water Agency
yd	yard
YOY	young-of-the-year
Yuba Accord	Adopted in 2008, the Yuba Accord consists of four agreements between Yuba County Water Agency and others to 1) increase Yuba County Water Agency's contribution to flows in the Lower Yuba River for fishery enhancement; 2) formalize conjunctive use practices in the Yuba County Water Agency's service area to help increase the volume of water available to increase the flows; 3) authorizes Yuba County Water Agency to sell the water, once it's downstream, to the CALFED Environmental Water Account and others; and 4) amends the YCWA and PG&E's power purchase contract.
Z	

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SECTION 1
INTRODUCTION

On November 5, 2010, pursuant to Section (§) 5.6 of Title 18 of the Code of Federal Regulations (CFR) and 18 CFR § 5.5, the Yuba County Water Agency's (YCWA or Licensee) filed with the Federal Energy Regulatory Commission (FERC) a Notice of Intent (NOI) to file an application (Major Project – Existing Dam) for a new license for the Yuba River Development Project, FERC Project No. 2246 (Project). YCWA is the existing licensee and the current owner and operator of the Project. The initial license for the Project was issued by the Federal Power Commission (FPC), FERC's predecessor, to YCWA on May 16, 1963, effective on May 1, 1963. The FPC's May 6, 1966, Order Amending License changed the license's effective date to May 1, 1966, for a term ending on April 30, 2016.

The NOI stated YCWA's intent to file the application in conformance with 18 CFR, Chapter 1, Subchapter B, Part 5, which is commonly referred to as FERC's Integrated Licensing Process, or ILP.

YCWA files with FERC this Revised Study Plan pursuant to 18 CFR § 5.11.

This section of the Revised Study Plan provides a brief description of YCWA's Project (Section 1.1), a summary of activities YCWA and others have taken to date to develop an application for a new license for the Project[2] (Section 1.2), and a description of the contents of this Revised Study Plan (Section 1.3).

1.1 Project Description

The Project is located in Yuba, Sierra, and Nevada counties, California, on the main stems of the Yuba River, the North Yuba River, and the Middle Yuba River, and on Oregon Creek, a tributary to the Middle Yuba River. A portion of the FERC Project Boundary[3] is located on public land managed by the United States Department of Agriculture, Forest Service, as either the Plumas National Forest (PNF) or Tahoe National Forest (TNF). The Project consists of three developments - New Colgate, New Bullards Minimum Flow, and Narrows 2 - whose principal works include:

- 1 dam and associated storage reservoir - New Bullards Bar
- 2 diversion dams - Our House and Log Cabin
- 2 diversion tunnels - Lohman Ridge and Camptonville

[2] These activities are collectively referred to as "relicensing."
[3] The existing FERC Project Boundary encompasses all Project facilities and features as well as all land needed by YCWA for the normal operation and maintenance of the Project. The boundary is shown in Exhibit J and K, Project Maps, of the existing FERC license for the Project.

- 2 underground power tunnels - New Colgate and Narrows 2
- 1 aboveground penstock - New Colgate
- 3 powerhouses - New Colgate, New Bullards Minimum Flow, and Narrows 2
- 7 recreation areas - Emerald Cove Marina, Hornswoggle Group Camp, Schoolhouse Family Camp, Dark Day Campground, Dark Day Boat Ramp, Garden Point Campground, and Madrone Cove Campground – all located on New Bullards Bar Reservoir
- Associated roads and other facilities

The Project does not include any aboveground water conveyance facilities (e.g., canals and flumes), any active spoil or borrow areas, or any transmission line facilities.[4, 5]

YCWA operates New Bullards Bar Reservoir by capturing winter and spring runoff from rain and snowmelt. Consequently, New Bullards Bar Reservoir normally reaches its annual peak storage at the end of the spring runoff season, and then is gradually drawn down until its lowest elevation is reached in mid-winter. The reservoir does not undergo substantial daily changes in elevation due to Project operations. Storage in Above Normal and Wet water years can also be affected by New Bullards Bar Reservoir mandatory flood pool criteria established by the United States Army Corps of Engineers (USACE) from October through April.[6]

Our House and Log Cabin diversion dam impoundments do not store water and YCWA operates them to divert water to New Bullards Bar Reservoir in spring during high flow periods.

One of the primary benefits of the Project is that Pacific Gas and Electric Company's (PG&E) dispatching of New Colgate Powerhouse through the California Independent System Operator (ISO) to balance the northern California Transmission System through regulation up and down. The powerhouse is under ISO Automatic Generator Control, so the ISO has the ability to vary New Colgate Powerhouse generation on a real-time basis to meet energy needs. YCWA operates New Bullards Minimum Flow and Narrows 2 powerhouses as base-load facilities.

The Project passes water through the federally-owned Englebright Reservoir, which is located on the Yuba River near the City of Marysville and managed by the United States Army Corps of Engineers (USACE). Englebright Dam is not part of the Project, nor is it under FERC's jurisdiction. None of the Yuba River Development Project facilities are integral parts of

[4] Project powerhouse switchyards are connected to the California Transmission Grid via non-Project transmission lines. Of note, the 60 kilovolt (kv) transmission line that extends from the Project's Narrows 2 Powerhouse Switchyard to the Grid is owned and operated by PG&E. The portion of the transmission line is part of PG&E's Narrows 2 Substation 60 kV Transmission Line Project, for which PG&E holds a Minor-Part License (FERC Project No. 2678) from FERC. PG&E's license for Project 2678 expires on April 30, 2016. On July 6, 2011, PG&E filed with FERC a Notice of Intent to relicense the Narrows 2 Substation 60 kV Transmission Line Project.

[5] The Project does not include the Narrows 1 Powerhouse, which is located on the south side of the Yuba River, about 0.5 mile downstream of the USACE's Englebright Dam. Narrows 1 Powerhouse is part of PG&E's Narrows Project (FERC Project No. 1403). PG&E's license for Project 1403 expires on January 31, 2023.

[6] The USACE contributed $12 million to the construction of New Bullards Bar Dam in exchange for flood control space the reservoir would provide.

Englebright Dam: the Project's Narrows 2 Power Conduit and Narrows 2 Powerhouse, the lowermost elevation Project facilities, are not connected or attached to Englebright Dam in any way, nor do they intersect the dam in any way (e.g., the powerhouse power tunnel and penstock does not pass through the dam).

A uniquely important set of agreements regarding Project operations is the Lower Yuba River Accord (Yuba Accord). In 2005, YCWA and 16 other interested parties signed memoranda of understanding (MOU) that specified terms of the Yuba Accord. The Yuba Accord is a comprehensive, consensus-based program to protect and enhance aquatic habitat in the Yuba River downstream of Englebright Dam. Following environmental review, YCWA executed four agreements in 2007, which together comprise the Yuba Accord. The four agreements are: 1) the Lower Yuba River Fisheries Agreement, which specifies the Yuba Accord's Lower Yuba River minimum streamflows and creates a detailed fisheries monitoring and evaluation program; 2) the Water Purchase Agreement, under which the California Department of Water Resources (CDWR) purchases water, some of which is provided by the Yuba Accord's minimum streamflows, from YCWA for CALFED's Environmental Water Account[7] and for State Water Project and Central Valley Project contractors; 3) the Conjunctive Use Agreements with seven of YCWA's member units, which specify the terms of the Yuba Accord's groundwater conjunctive use program; and 4) amendments to the 1966 Power Purchase Contract between YCWA and PG&E.[8]

The Yuba Accord was developed by a multi-agency resource team, including representatives from USFWS, NMFS, California Department of Fish and Game (CDFG), and a group of non-governmental organizations (NGO). The Yuba Accord flow schedules were developed to essentially optimize fisheries habitat conditions during a majority[9] of years for this regulated river system. Subsequently, additional flow schedules were developed by the resources team for drier conditions which included a "balancing of resources" approach. Together, this package of agreements commits more water to minimum instream flows and provides greater reliability for both instream and consumptive uses than would be possible without the agreements.

The Yuba Accord also provided a $6 million River Management Fund for monitoring and evaluation of anadromous fish and their habitat in the Yuba River downstream of Englebright Dam. The fund is administered by the River Management Team (RMT), which is comprised of representatives of YCWA, NMFS, USFWS, CDFG, Pacific Gas and Electric Company (PG&E), CDWR, South Yuba River Citizens League (SYRCL), Trout Unlimited, Friends of the River, and The Bay Institute, all of whom are signatory to the Lower Yuba River Fisheries Agreement. The RMT, in collaboration with representatives from University of California, Davis (UC Davis) and the Pacific States Marine Fisheries Commission, has developed a Monitoring and Evaluation

[7] The purchase of water through the Yuba Accord Water Purchase Agreement was the first long-term acquisition of water by the CDWR that protects San Francisco Bay/Delta fish and wildlife.

[8] The 1966 Power Purchase Agreement between YCWA and PG&E expires on April 30, 2016, the same day the existing FERC license for the Yuba River Development Project expires.

[9] The Yuba Accord establishes minimum streamflows in the Yuba River downstream of Englebright Dam for six water year types ranging from wet water years (Schedule 1) to dry water years (Schedule 6). Conferences with agencies are scheduled in very dry years to set minimum streamflows. Water years in Schedule 1 and 2, the wetter water years, are expected to occur approximately 78 percent of the time.

Program (M&E Program) to guide the efficient expenditure of the River Management Fund to evaluate the effects of implementation of the Yuba Accord on the aquatic resources of the lower Yuba River over the period extending from 2008 to 2016. The M&E Program embraces a monitoring-based adaptive management approach to increase the effectiveness of, and to address the scientific uncertainty associated with, specific monitoring and study activities, and restoration actions.

The primary purpose of the M&E Program is to provide the monitoring data necessary to evaluate whether implementation of the Yuba Accord will maintain fish resources (i.e., the fish community including native fish and non-native fish) of the lower Yuba River in good condition, and will maintain viable anadromous salmonid populations. The RMT has developed an M&E Program framework document that identifies data collection needs, analytic approaches and thresholds or other metrics for comparison or evaluation. The RMT has developed study plans (i.e., Protocols, which should not be confused with the relicensing study proposals) have been developed and deployed for:

- Flow and Water Temperature Monitoring
- Topographic Mapping (Digital Elevation Model, or DEM)
- Substrate and Cover Mapping
- 2D Hydrodynamic Modeling
- Morphologic Unit Classification
- Mesohabitat Classification
- Riparian Vegetation Mapping
- Acoustic Tagging and Tracking
- VAKI™ Riverwatcher Fish Counter Monitoring
- Redd Surveys
- Fish Carcass Surveys
- Snorkel Surveys
- Rotary Screw Trap (RST) Fish Collection
- Genetic Sampling and Characterization
- Otolith Sampling and Characterization

The RMT monitors data collection activities, reviews analytic techniques, performs quality assurance/quality control (QA/QC) reviews of data and products, and compiles annual data reports. Monitoring observations, data and annual reports are made available on the RMT website (www.yubaaccordrmt.com) as they become available. Additionally, the RMT provides data upon request to various other study efforts including those of RMT member entities. The RMT routinely coordinates and shares data with several other Sacramento River Valley monitoring or scientific programs, and data-shares with CDWR's Feather River monitoring

programs, various CDFG monitoring programs, and research projects based at UC Davis, University of South Carolina, State University of New York, and the University of Idaho.

YCWA has been operating the Project in conformance with the Yuba Accord since 2006.[10] On May 20, 2008, the State Water Resources Control Board (SWRCB) adopted its Corrected Order WR 2008-0014, which approved the long-term amendments to YCWA's water-right permits that were necessary so that YCWA may continue to implement the Yuba Accord.

1.2 Relicensing Activities to Date

1.2.1 YCWA's Pre-NOI Filing Meetings

From July 2009 through the filing of its NOI on November 5, 2010, YCWA held approximately 30 meetings with Relicensing Participants.[11] The meetings included both one-on-one meetings, joint meetings, tours of the Project on October 1 and November 30, 2009, and an issues/effects identification meeting on January 13, 2010.

Since March 2010, the primary purpose of many of YCWA's meetings was the collaborative development of study proposals. The goal of these meetings was to reach agreement on as many study proposals as possible with as many Relicensing Participants as possible prior to YCWA's filing of its NOI. To facilitate this process, YCWA took the following actions:

- YCWA created a Yuba River Development Project relicensing Website, which contains existing information regarding the Project as well as Communication Guidelines. YCWA posts relicensing documents to the website as they are developed, and maintains on the website a schedule of upcoming relicensing meetings. The address of the website is (www.ycwa-relicensing.com).
- On September 29, 2009, YCWA distributed a Preliminary Information Package that was formatted similar to and contained much of the information required by FERC to be included in a Pre-Application Document (PAD).
- YCWA developed and posted to the Relicensing Website 41 "straw man" study proposals. The purpose of these "straw man" study proposals was to facilitate open discussion regarding additional data needs. YCWA stated that its "straw man" study proposals did not preclude the development of additional study proposals. Each "straw man" study proposal was posted in Microsoft© Word format to facilitate red-lining by Relicensing Participants, and was modified during meetings. YCWA posted red-lined versions of the study proposals on the Relicensing Website as they were provided to YCWA by Relicensing Participants and following the meetings during which the study proposal was discussed.

[10] The 2006, 2007, and early 2008 operations were under 1-year pilot programs that were approved by the SWRCB.
[11] In this document, federal, state and local agencies; Native American tribes; NGOs; local businesses; and unaffiliated members of the public active in the relicensing are collectively referred to as "Relicensing Participants." Relicensing Participants include FERC.

Further, YCWA stated that if collaborative agreement was reached on a study proposal and YCWA had funds available to perform the study, YCWA would consider beginning the study in 2011, at its own risk, prior to FERC's issuance of a Study Determination.

1.2.2 YCWA's Filing of Its NOI and PAD

On November 5, 2010, YCWA filed with FERC its NOI. At the same time, YCWA filed its PAD with FERC and distributed the PAD to Relicensing Participants. The PAD provided existing, relevant, and reasonably available information regarding the Project and the resources potentially affected by continued operation and maintenance of the Project.

At the time YCWA filed its PAD, YCWA and Relicensing Participants had reviewed each of YCWA's "straw man" study proposals, but had not reached collaborative agreement on any. The PAD included 41 detailed preliminary study proposals (Table 1.2.2-1), which were prepared considering many of the comments made by Relicensing Participants during pre-filing meetings.[12] YCWA stated in the PAD and at subsequent Relicensing Participant meetings that it considered the detailed study proposals preliminary: YCWA included them in the PAD to facilitate early and efficient discussion regarding study proposal development. Also, YCWA stated in the PAD that, based on continuing discussions with Relicensing Participants and comments on the PAD, YCWA may choose not to include in its Proposed Study Plan one or more of the preliminary study proposals included in the PAD or to include in the Proposed Study Plan modified versions of the study proposals that were included in the PAD.

Table 1.2.2-1. List of YCWA's preliminary proposed study proposals included in YCWA's Pre-Application Document.

Study Number	Study Name
GEOLOGY AND SOILS	
1.1	Channel Morphology Upstream of Englebright Reservoir
1.2	Channel Morphology Downstream of Englebright Dam
WATER RESOURCES	
2.1	Hydrologic Alteration
2.2	Water Balance/Operations Model
2.3	Water Quality
2.4	Bioaccumulation
2.5	Water Temperature Monitoring
2.6	Water Temperature Model
AQUATIC RESOURCES	
3.1	Aquatic Macroinvertebrates Upstream of Englebright Reservoir
3.2	Aquatic Macroinvertebrates Downstream of Englebright Dam
3.3	Special-Status Aquatic Mollusks
3.4	Special-Status Amphibians – Foothill Yellow-Legged Frog Surveys

[12] YCWA divided some resources studies (e.g., channel morphology, riparian habitat, stream fish populations and instream flow) into two separate studies: one for upstream of USACE's Englebright Dam and one for downstream of Englebright Dam. In most cases, the reason for this is that the study methods used upstream and downstream of Englebright Dam are different due to different channel conditions and availability of existing information. In addition, some Relicensing Participant's interests differ for the areas upstream and downstream of the dam. For example, the Forest Service manages federal land upstream of Englebright Dam, but not downstream of the dam.

Table 1.2.2-1. (continued)

Study Number	Study Name
AQUATIC RESOURCES (continued)	
3.5	Special-Status Amphibians – Foothill Yellow-Legged Frog Habitat Modeling
3.6	Special-Status Turtles – Western Pond Turtle
3.7	Reservoir Fish Populations
3.8	Stream Fish Populations Upstream of Englebright Reservoir
3.9	Stream Fish Populations Downstream of Englebright Dam
3.10	Instream Flow Upstream of Englebright Reservoir
3.11	Fish Entrainment
WILDLIFE RESOURCES	
4.1	Special-Status Wildlife – California Wildlife Habitat Relationships
4.2	Special-Status Wildlife – Bats
BOTANICAL RESOURCES	
5.1	Special-Status Plants
WETLAND, RIPARIAN AND LITTORAL HABITATS	
6.1	Riparian Habitat Upstream of Englebright Reservoir
6.2	Riparian Habitat Downstream of Englebright Dam
6.3	Wetlands
THREATENED, ENDANGERED AND FULLY PROTECTED SPECIES	
7.1	ESA-Listed Plants
7.2	Narrows 2 Powerhouse Intake
7.3	ESA-Listed Amphibians – California Red-Legged Frog
7.4	ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle
7.5	CESA-Listed Plants
7.6	CESA-Listed and Fully Protected Wildlife – California Wildlife Habitat Relationships
7.7	CESA-Listed and Fully Protected Wildlife – Bald Eagle
7.8	ESA/CESA-Listed Salmonids Downstream of Englebright Dam
7.9	North American Green Sturgeon Downstream of Englebright Dam
7.10	Instream Flow for Steelhead and Chinook Salmon Downstream of Englebright Dam
RECREATIONAL RESOURCES	
8.1	Recreation Use and Visitor Surveys
8.2	Recreational Flow
LAND USE	
9.1	Primary Project Roads and Trails
AESTHETIC RESOURCES	
10.1	Visual Quality
SOCIO-ECONOMIC RESOURCES	
--	None
CULTURAL RESOURCES	
12.1	Historic Properties
TRIBAL RESOURCES	
13.1	Native American Traditional Cultural Properties
Total	**41**

1.2.3 FERC's Issuance of Notice of Commencement of Proceeding and Scoping Document 1

On January 4, 2011, FERC issued a Notice of Commencement of Proceeding and Scoping Document 1 (SD1) for the Yuba River Development Project relicensing in accordance with 18 CFR § 5.8. The notice advised agencies, tribes and the public that YCWA had filed its NOI and PAD; stated that FERC was initiating informal consultation with the United States Department of Interior (USDOI), Fish and Wildlife Service (USFWS) and United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (ESA) and the joint agency regulations thereunder at 50 CFR, Part 402 and (b); and similarly was initiating informal consultation with California State Historic Preservation Officer (SHPO) as required by Section

106 of the National Historical Preservation Act (NHPA), and the implementing regulations of the Advisory Council on Historic Preservation at 36 CFR § 800.2. The notice designating YCWA as FERC's non-federal representative for carrying out informal consultation, pursuant to Section 7 of the ESA and Section 106 of the NHPA. The notice also advertised FERC's February 1, 2011 site visit and February 2, 2011 public meetings.

SD1 provided YCWA and Relicensing Participants with FERC's preliminary list of issues and alternatives to be addressed in an environmental assessment for analyzing conditions of a new Project license, and a process schedule.

FERC requested that comments on SD1 and YCWA's PAD be provided to FERC no later than March 7, 2011.

1.2.4 FERC's Site Visit and NEPA Scoping Meetings

On February 1, 2011, FERC conducted a site visit for the Project. On February 2, 2011, FERC held two National Environmental Policy Act (NEPA) public scoping meetings for the Project in Marysville, California. The meetings were transcribed and the transcripts are available on FERC's ELibrary (http://elibrary.ferc.gov).

1.2.5 YCWA's Study Proposal Development Meetings Prior to the Deadline for Filing PAD Comments

To further facilitate study proposal development, YCWA and Relicensing Participants scheduled a series of meetings beginning in November 2010 and continuing through filing of the Revised Study Plan by August 17, 2011 to discuss study proposals. The goal of these meetings was to reach agreement on as many study proposals as possible with as many Relicensing Participants and YCWA as possible.

Between the time the PAD was filed in November 2010 and the deadline for filing comments on the PAD on March 7, 2011, 11 study proposal development meetings were held, in which 17 of YCWA's study proposals were discussed. The discussions focused primarily on those studies Relicensing Participants believed should begin in 2011 prior to FERC's Study Determination.

1.2.6 YCWA's Filing of Redlined Study Proposals

On February 11, 2011, in an attempt to ease the burden of the PAD comment process for Relicensing Participants, YCWA filed with FERC a letter that included redlines of 10 preliminary study proposals included in Table 1.2.2-1. Each of the study proposals had been included in the PAD and had been discussed and revised at one of the study proposal development meetings described in Section 1.2.5. In its letter, YCWA committed to include each of the study proposals in the letter, excluding editorial changes, in its Proposed Study Plan. YCWA reserved its right to further modify each of the study proposals for inclusion in the Proposed Study Plan based on comments on the PAD and additional discussions with Relicensing Participants.

YCWA expressly stated in its letter that YCWA did not intend that the letter would amend its PAD, which might result in some stakeholders requesting an extension to the PAD comment filing deadline. Rather, the letter expressed YCWA's intention that providing the latest version of certain study plans might be useful for Relicensing Participants as they prepared their comments on the PAD.

YCWA expressly stated that, by filing the letter, YCWA did not imply in any way that agencies and other Relicensing Participants might not have additional comments on each of the redlined study proposals included in the letter or on other preliminary study proposals included in the PAD, or that they might not request new studies.

The redlined study proposals included in YCWA's February 11, 2011 letter were:

1. Study 1.1: Channel Morphology Upstream of Englebright Reservoir
2. Study 2.3: Water Quality
3. Study 2.4: Bioaccumulation
4. Study 2.5: Water Temperature Monitoring
5. Study 3.3: Special-Status Amphibians - Foothill Yellow-Legged Frog Surveys
6. Study 3.8: Stream Fish Populations Upstream of Englebright Reservoir
7. Study 5.1: Special-Status Plants
8. Study 6.1: Riparian Habitat Upstream of Englebright Reservoir
9. Study 12.1: Historic Properties
10. Study 13.1: Native American Traditional Cultural Properties

1.2.7 Comments on FERC's SD1

By the March 7, 2011 filing deadline, eight comment letters on FERC's SD1 were filed with FERC. Table 1.2.7-1 lists the identity of the commenter and the date of the comment letter.

Table 1.2.7-1. Comment letters filed with FERC on FERC's Scoping Document 1.

Commenter	Date of Comment Letter
Cordua Irrigation District	2/17/11
United States Department of Agriculture, Forest Service	3/2/11
California Department of Fish and Game	3/2/11
Foothills Water Network	3/5/11
United State Department of Interior, Fish and Wildlife Service	3/7/11
State Water Resources Control Board	3/7/11
Yuba County Water Agency	3/7/11
United States Department of Commerce, National Marine Fisheries Service	3/7/11
Total	**8**

1.2.8 Comments on YCWA's PAD

By the March 7, 2011 filing deadline, 30 comment letters on YCWA's PAD were filed with FERC. Table 1.2.8-1 below lists the identity of each commenter and the date the comment letter was filed.

Table 1.2.8-1. Comment letters filed with FERC on YCWA's Pre-Application Document.

Commenter	Date of Comment Letter
United Auburn Indian Community	2/1/11
Gold Country Fly Fishers	2/9/11
Emerald Cove Marina	2/28/11
Gardner	2/28/11
Billings	2/28/11
Byers	2/28/11
Collier	2/28/11
United States Department of Agriculture, Forest Service	3/2/11
California Department of Fish and Game	3/2/11
Burton	3/2/11
Myles and Scott	3/2/11
Gandy	3/3/11
United States Department of Interior, National Parks Service	3/4/11
Phillipson	3/5/11
Foothills Water Network	3/5/11
Bodhaine	3/6/11
Dixon	3/6/11
Hansen	3/7/11
Watts	3/7/11
Fye	3/7/11
Kurashewich	3/7/11
Hatfield	3/7/11
Camptonville Community Service District	3/7/11
Federal Energy Regulatory Commission	3/7/11
State Water Resources Control Board	3/7/11
United State Department of Interior, Fish and Wildlife Service	3/7/11
United States Department of Commerce, National Marine Fisheries Service	3/7/11
Yuba County Fish and Game Commission	3/7/11
Camptonville Community Partnership	7/29/09[1]
Feather River Chapter of Trout Unlimited	3/10/11
Total	**30**

[1] FERC posted Camptonville Community Partnership's July 29, 2009 letter, to the docket on March 7, 2011. Therefore, YCWA is treating the July 2009 letter as a comment on its PAD.

The commenters requested modifications to 28 of the 41 study proposals in YCWA's PAD and 19 new studies. The 13 study proposals in YCWA's PAD for which modifications were not requested were:

- Study 2.6 - Water Temperature Model
- Study 3.2 - Aquatic Macroinvertebrates Downstream of Englebright Dam
- Study 3.3 - Special-Status Aquatic Mollusks

- Study 3.4 - Special-Status Amphibians – Foothill Yellow-Legged Frog Surveys
- Study 4.1 - Special-Status Wildlife – California Wildlife Habitat Relationships
- Study 6.3 – Wetlands
- Study 7.1 - ESA-Listed Plants
- Study 7.3 - ESA-Listed Amphibians – California Red-Legged Frog
- Study 7.4 - ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle
- Study 7.5 - CESA-Listed Plants
- Study 7.6 - CESA-Listed and Fully Protected Wildlife – California Wildlife Habitat Relationships
- Study 7.7 – CESA-Listed and Fully Protected Wildlife – Bald Eagle
- Study 9.1 - Primary Project Roads and Trails

1.2.9 YCWA's Study Proposal Development Meetings Between Filing of PAD Comments and Filing of Proposed Study Plan

Between the times that Relicensing Participants filed comments on the PAD on March 7, 2011 and YCWA filed its Proposed Study Plan on April 19, 2011, YCWA and Relicensing Participants held two meetings. The first was a conference call on March 9, 2011 to discuss scheduling of meetings in 2011 to try to reach agreement on as many studies as possible with as many Relicensing Participants as possible. The second meeting was a Web call to review YCWA's proposed Water Temperature Model Study Proposal (Study 2.6) and the development of unimpaired and regulated hydrology.

1.2.10 YCWA's Initiation of Selected Studies in 2011

YCWA initiated nine studies in 2011 prior to FERC's Study Determination. These studies are listed below.

1. Channel Morphology Upstream of Englebright Reservoir (Study 1.1)
2. Bioaccumulation (Study 2.4)
3. Water Temperature Monitoring (Study 2.5)
4. Special-Status Amphibians - Foothill Yellow-Legged Frog Surveys (Study 3.4)
5. Instream Flow Above Englebright Reservoir (Study 3.10)
6. Riparian Habitat Upstream of Englebright Reservoir (Study 6.1)
7. Recreation Flow (Study 8.2)
8. Historic Properties (Study 12.1)
9. Native American Traditional Cultural Properties (Study 13.1)

Assuming that FERC would include these studies in its Study Determination, YCWA intended to treat work performed to date for each of the studies as "ahead of schedule" for ILP purposes since the work will have been initiated prior to the time FERC issues the Study Determination.

Subsequently, YCWA suspended work on three of the above studies. YCWA suspended work on Study 1.1, Channel Morphology Upstream of Englebright Reservoir, because Relicensing Participants had significantly more comments on the study proposal in their PAD comments. Therefore, YCWA deemed the scope of the study to be uncertain and suspended work. YCWA suspended work on Study 3.4, Special-Status Amphibians - Foothill Yellow-Legged Frog (FYLF) Surveys. The Forest Service, noting the 2011 wet water year, advised YCWA that it would likely request the surveys be repeated in 2012. YCWA therefore decided that the 2011 work might not be reliable, and therefore, suspended 2011 work, except on the three Oregon Creek survey sites, where surveys had already begun and where flow conditions were conducive to FYLF breeding. Last, YCWA suspended work on Study 3.10, Instream Flow Above Englebright Reservoir, which included development of one-dimensional (1D) hydraulic models because USFWS requested in its PAD comments that the study develop two-dimensional (2D), rather than 1D models. YCWA suspended work on the study pending resolution of model type.

1.2.11 FERC's Issuance of Scoping Document 2

On April 18, 2011, FERC issued Scoping Document 2 (SD2), which addressed comments on SD1.

1.2.12 YCWA's Filing of Its Proposed Study Plan

On April 19, 2011, YCWA filed with FERC its Proposed Study Plan. The Proposed Study Plan included 41 detailed preliminary study proposals. These were the same studies as identified in the PAD, but modified based on comments on the PAD and continuing discussions with Relicensing Participants. YCWA stated in the Proposed Study Plan and at subsequent Relicensing Participant meetings that it considered the study proposals preliminary: YCWA included them in the Proposed Study Plan to facilitate discussion regarding study proposal development.

1.2.13 YCWA's Study Proposal Development Meetings Between Filing of Its Proposed Study Plan and Filing of Comments on Its Proposed Study Plan

Between the times that YCWA filed its Proposed Study Plan on April 19, 2011 and comments were filed on YCWA's Proposed Study Plan on July 18, 2011, YCWA and Relicensing Participants held approximately 20 meetings or calls in an attempt to resolve differences regarding studies. The meetings included a formal Proposed Study Plan meeting on May 11, 2010, and a series of Endangered Species Act (ESA) Section 7 informal consultation meetings with NMFS.

1.2.14 YCWA's Posting of Redlined Study Proposals to the Relicensing Website

By June 22, 2011, in an attempt to ease the burden of the Proposed Study Plan comment process for Relicensing Participants, YCWA posted to its Relicensing Website 16 preliminary study proposals included in Table 1.2.2-1. Each of the study proposals had been included in the Proposed Study Plan and had been discussed and revised at one or more of the 20 study proposal development meetings described in Section 1.2.12. YCWA committed to Relicensing Participants to include each of the study proposals, excluding editorial changes, in its Revised Study Plan. YCWA reserved its right to further modify each of the study proposals for inclusion in the Revised Study Plan based on comments on the Proposed Study Plan. The file names of the redlined study proposals posted to the Relicensing Website were:

1. Study 1.1: Channel Morphology Above Englebright Reservoir – Redline - L061711
2. Study 2.3: Water Quality – Redline – L061711
3. Study 2.4: Bioaccumulation - Redline – L061711
4. Study 2.6: Water Temperature Model – Redline – L062111
5. Study 3-1 - Aquatic Macroinvertebrates Above Englebright - Redline - L061711
6. Study 3-3 - Special-Status Mollusks - Redline - L061711
7. Study 3-5 - Special-Status Amphibians - FYLF Habitat Modeling - Redline - L061711
8. Study 3-7 - Reservoir Fish Populations - Redline - L061711
9. Study 3.8: Stream Fish Populations Upstream of Englebright Reservoir - Redline - L061711
10. Study 3-10 - Instream Flow Above Englebright - Redline - L061711
11. Study 4-2 - Special-Status Wildlife - Bats - Redline - L061711
12. Study 8-1 - Recreation Use and Visitor Survey - Redline - L062211
13. Study 8-2 - Recreation Flow - Redline - L061711
14. Study 10-1 - Visual Quality - Redline - L061711
15. Study 12.1: Historic Properties- Redline - L061711
16. Study 13.1: Native American Traditional Cultural Properties- Redline - L061711

1.2.15 Comments on YCWA's Proposed Study Plan

By the July 18, 2011 filing deadline, eight comment letters on YCWA's Proposed Study Plan were filed with FERC. Table 1.2.14-1 below lists the identity of the commenter and the date the comment letter was filed.

Table 1.2.14-1. Comment letters filed with FERC on YCWA's Proposed Study Plan.

Commenter	Date of Comment Letter
United States Department of Agriculture, Forest Service	7/12/11
California Department of Fish and Game	7/12/11
United States Department of Interior, National Parks Service	7/13/11
United States Department of Interior, Fish and Wildlife Service	7/15/11
Foothills Water Network	7/17/11
County of Yuba, Fish and Game Commission	7/17/11
United States Department of Commerce, National Marine Fisheries Service	7/18/11
State Water Resources Control Board	7/18/11
Total	**8**

1.2.16 YCWA's Study Proposal Development Meetings Between Filing of Comments on Its Proposed Study Plan and Filing of Its Revised Study Plan

Between the times that comments were filed on YCWA's Proposed Study Plan on July 18, 2011 and YCWA filed this Revised Study Plan on August 17, 2011, YCWA and Relicensing Participants held five meetings in an attempt to resolve differences regarding studies. Two of the meetings focused specifically on resolving disagreements with the Forest Service and NPS regarding the Recreation Use and Visitor Surveys Study (Study 8.1) and one of the meetings was an ESA Section 7 informal consultation meeting with NMFS.

1.3 Content of This Revised Study Plan

This Revised Study Plan includes the following sections:

- Section 1. Introduction – This section describes the Project, relicensing activities to date, and the content of the Revised Study Plan.
- Section 2. Licensee's Proposed Studies - This section discusses YCWA's detailed study proposals that may be needed to gather additional information for the Project. The actual study proposals are included in Appendix 1 to this Revised Study Plan. In addition, to facilitate FERC's and Relicensing Participants review of the Revised Study Plan, YCWA has included in Appendix 2 to this Revised Study Plan redlined versions of the study proposals that were included in the Proposed Study Plan. The redlined versions show changes that were made to the study proposals that were included in the Proposed Study Plan.
- Section 3. Licensee's Reply to Study Requests - This section provides YCWA's reply to study requests that were filed with FERC on YCWA's Proposed Study Plan. Specifically, for any requested study modification or new study (i.e., a study not proposed by YCWA in its Proposed Study Plan) that was not adopted by YCWA in this Revised Study Plan, Section 3.2 provides an explanation of why the request was not adopted with reference to the criteria set forth in 18 CFR § 5.9(b). YCWA has not provided in this Revised Study Plan specific replies to non-study request comments (e.g., editorial or general comments, or comments on the PAD that are not study requests).

- Section 4. Data Availability and Reports – This section describes provisions for YCWA's periodic progress reporting.
- Section 5. Status of Enhancements – This section describes the status of YCWA's evaluation of potential generation enhancements to the existing Project.
- Section 6. References Cited – This section includes a list of references cited in the Revised Study Plan.
- Appendix 1. Clean Detailed Study Proposals – This appendix includes YCWA's detailed study proposals.
- Appendix 2. Redlined Detailed Study Proposals – This appendix includes redlined versions of the study proposals that were included in the Proposed Study Plan. The redlined versions show changes that were made to the study proposals that were included in the Proposed Study Plan.

1.4 List of Attachments to This Section

None.

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SECTION 2
LICENSEE'S PROPOSED STUDIES

This section of the Revised Study Plan provides 42 proposed studies[13] that YCWA believes are needed to gather additional information for environmental analysis of the Project. YCWA believes the information developed by these studies, when combined with existing information as summarized in YCWA's PAD and other ongoing data gathering efforts for other proceedings in the Yuba River Basin will provide the information needed to evaluate issues that may arise from continued Project operations and maintenance (O&M), and may later inform the development of license requirements.

For the purpose of this Revised Study Plan, a "study" is considered to be any data gathering or analysis effort. A study may or may not include fieldwork.

Table 2.0-1, which is organized into major resource areas, provides a summary of YCWA's study proposals. For ease of reference, each study proposal in Table 2.0-1 is placed into one of three categories:

- Included in YCWA's Proposed Study Plan and Unchanged Version (excluding editorial and formatting changes) Included in the Revised Study Plan. YCWA proposed this study in its Proposed Study Plan, and has not revised the study in the Revised Study Plan (i.e., comments may not have been filed on the specific study proposal, or comments were filed but not adopted by YCWA), other than footers, the date of the study proposal, and general editorial and formatting corrections for inclusion in the Revised Study Plan.
- Included in YCWA's Proposed Study Plan and Revised Version Included in the Revised Study Plan. The revisions are based on comments at study proposal development meetings and comments on the Proposed Study Plan. There are changes to the study proposal besides general editorial and formatting corrections (i.e., there are changes that affect study area or methods or both). For the purpose of the Revised Study Plan, the 16 redlined study proposals YCWA posted to its Relicensing Website by June 22, 2011 (Section 1.2.13) are considered revised study proposals.
- Not Included in YCWA's Proposed Study Plan but Included in the Revised Study Plan. This is a new study (i.e., not included in the Proposed Study Plan) proposed by YCWA in its Revised Study Plan.

[13] The studies in the Revised Study Plan include the 41 studies from YCWA's Proposed Study Plan, which modifications to address comments on the Proposed Study Plan and discussions with Relicensing Participants, and one additional study (Study 7.11, Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration) that was not included in YCWA's Proposed Study Plan.

Table 2.0-1. Studies proposed by YCWA for the Yuba River Development Project.

Study Number	Study Description	Proposed by YCWA's Revised Study Plan		
		Included in Proposed Study Plan & Unchanged Version[1] Included in Revised Study Plan	Included in Proposed Study Plan & Revised Version[2] Included in Revised Study Plan	Not Included in Proposed Study Plan & New Study Included in Revised Study Plan
GEOLOGY AND SOILS				
1.1	Channel Morphology Upstream of Englebright Reservoir	--	X	--
1.2	Channel Morphology Downstream of Englebright Dam	--	X	--
WATER RESOURCES				
2.1	Hydrologic Alteration	--	X	--
2.2	Water Balance/Operations Model	X	--	--
2.3	Water Quality	--	X	--
2.4	Bioaccumulation	--	X	--
2.5	Water Temperature Monitoring	X	--	--
2.6	Water Temperature Model	--	X	--
AQUATIC RESOURCES				
3.1	Aquatic Macroinvertebrates Upstream of Englebright Reservoir	--	X	--
3.2	Aquatic Macroinvertebrates Downstream of Englebright Dam	--	X	--
3.3	Special-Status Aquatic Mollusks	--	X	--
3.4	Special-Status Amphibians – Foothill Yellow-Legged Frog Surveys	X	--	--
3.5	Special-Status Amphibians – Foothill Yellow-Legged Frog Habitat Modeling	--	X	--
3.6	Special-Status Turtles – Western Pond Turtle	--	X	--
3.7	Reservoir Fish Populations	--	X	--
3.8	Stream Fish Populations Upstream of Englebright Reservoir	--	X	--
3.9	Non-ESA-Listed Fish Populations Downstream of Englebright Dam	--	X	--
3.10	Instream Flow Upstream of Englebright Reservoir	--	X	--
3.11	Fish Entrainment	X	--	--
WILDLIFE RESOURCES				
4.1	Special-Status Wildlife – California Wildlife Habitat Relationships	X	--	--
4.2	Special-Status Wildlife – Bats	X	--	--
BOTANICAL RESOURCES				
5.1	Special-Status Plants	X	--	--
WETLANDS, RIPARIAN AND LITTORAL HABITATS				
6.1	Riparian Habitat Upstream of Englebright Reservoir	--	X	--
6.2	Riparian Habitat Downstream of Englebright Dam	--	X	--
6.3	Wetlands	X	--	--

Table 2.0-1. (continued)

Study Number	Study Description	Proposed by YCWA's Revised Study Plan		
		Included in Proposed Study Plan & Unchanged Version[1] Included in Revised Study Plan	Included in Proposed Study Plan & Revised Version[2] Included in Revised Study Plan	Not Included in Proposed Study Plan & New Study Included in Revised Study Plan
THREATENED, ENDANGERED AND FULLY PROTECTED SPECIES				
7.1	ESA-Listed Plants	--	X	--
7.2	Narrows 2 Powerhouse Intake	--	X	--
7.3	ESA-Listed Amphibians – California Red-Legged Frog	--	X	--
7.4	ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle	--	X	--
7.5	CESA-Listed Plants	X	--	--
7.6	CESA-Listed and Fully Protected Wildlife – California Wildlife Habitat Relationships	X	--	--
7.7	CESA-Listed and Fully Protected Wildlife – Bald Eagle	X	--	--
7.8	ESA/CESA-Listed Salmonids Downstream of Englebright Dam	--	X	--
7.9	North American Green Sturgeon Downstream of Englebright Dam	--	X	--
7.10	Instream Flow Downstream of Englebright Dam	--	X	--
7.11	Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration	--	--	X
RECREATION RESOURCES				
8.1	Recreation Use and Visitor Surveys	--	X	--
8.2	Recreational Flow	--	X	--
LAND USE				
9.1	Primary Project Roads and Trails	X	--	--
AESTHETIC RESOURCES				
10.1	Visual Quality	--	X	--
SOCIO-ECONOMIC RESOURCES				
None	--	--	--	--
CULTURAL RESOURCES				
12.1	Historic Properties	--	X	--
TRIBAL INTERESTS				
13.1	Native American Traditional Cultural Properties	--	X	--
	Subtotal	*13*	*28*	*1*
	Total	**42**		

[1] Unchanged other than general editorial and formatting corrections.

[2] Changes that affect study area or methods or both.

Appendix 1 to this Revised Study Plan includes YCWA's 42 proposed studies by resource area.

To facilitate FERC's and Relicensing Participants review of the Revised Study Plan, YCWA has included in Appendix 2 redlined versions of each of the 42 study proposals. The redlined

versions show changes, including editorial and formatting changes, which were made to the study proposals that were included in the Proposed Study Plan.

Meaning of the Words "Collaborate" and "Consult" in YCWA's Study Proposal

A number of YCWA's study proposals provide that YCWA and Relicensing Participants will "collaborate" or "consult" with Relicensing Participants, or subset of Relicensing Participants such as key agencies, regarding one or more items in the study proposal and, if YCWA and Relicensing Participants agree on a course of action, YCWA will implement the course of action. Although not expressly stated in each study proposal, in those cases where "collaboration" is required, this shall mean YCWA and the Relicensing Participants will make a reasonable effort to reach a consensus decision using the "can you live with it" threshold described in Section 2.3.6.8 of YCWA's PAD, and such decisions will be final to the extent required in the study proposal. Failure to reach consensus after YCWA makes a reasonable effort to collaborate will complete YCWA's requirement for "collaboration" (i.e., collaboration can result in an agreement to disagree).

Where a study proposal or plan requires "consultation," this shall mean that YCWA will make a reasonable effort to seek out the opinions and input of Relicensing Participants prior to YCWA making a decision. Consultation does not require that YCWA and Relicensing Participants reach consensus, though YCWA's goal in all cases is to do so.

Use of RMT Information in YCWA's Study Proposals

Seven of YCWA's study proposals refer to information that has been or is being developed by the Yuba Accord RMT and would be used in relicensing (see Section 1.1). These studies include:

- Study 1.2 – Channel Morphology Downstream of Englebright Dam
- Study 3.9 – Non-ESA-Listed Fish Populations Downstream of Englebright Dam
- Study 6.2 – Riparian Habitat Downstream of Englebright Dam
- Study 7.2 – Narrows 2 Powerhouse Intake
- Study 7.8 – ESA/CESA-Listed Salmonids Downstream of Englebright Dam
- Study 7.9 - North American Green Sturgeon Downstream of Englebright Dam
- Study 7.10 – Instream Flow Downstream of Englebright Dam

Key products from the RMT will include QA/QC'ed data from RMT study plans, the RMT's DEM map and 2D models of the Yuba River downstream of Englebright Dam, annual study reports, analytics undertaken for inclusion in the RMT's M&E Program reports, and other products such as published papers developed by RMT member entities.

The Lower Yuba River Fisheries Agreement for the Yuba Accord specifically obligates the Yuba Accord parties to develop information useful for the relicensing process. Section 1.2.1 of the

Agreement states in part, "*The Parties intend that their monitoring and data-collection actions will produce a useful database for the proceedings of the Federal Energy Regulatory Commission regarding the relicensing of YCWA's FERC License for the Yuba Project, which expires in 2016*."

YCWA plans to utilize RMT-developed information rather than develop the information separately in the RMT and relicensing processes. To be clear, where a YCWA relicensing study proposal states that information is needed for relicensing and is being developed by the RMT, if the RMT does not develop the information as described in the study proposal, YCWA will develop and make the information available to Relicensing Participants as a product of the study in which the information is identified. Also, all information developed as part of the relicensing, whether it is developed in the relicensing process or developed in the RMT process and brought into the relicensing, will be made public when YCWA files its final study reports. Further, if a YCWA study report relies on information from RMT data, report or analytics, YCWA will attach the relevant RMT work product to the relicensing report for ease of reference.

2.1 List of Attachments to This Section

None.

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SECTION 3
LICENSEE'S REPLY TO STUDY REQUESTS

This section provides YCWA's reply to requests for modifications to the studies proposed by YCWA in its Proposed Study Plan and to requests for "new" studies (i.e., studies not proposed by YCWA in its PAD). This section contains two main subsections. Section 3.1 describes comment letters filed on the Proposed Study Plan. Section 3.2 provides, for each study modification (Section 3.2.1) or new study (Section 3.2.2) request not adopted by YCWA, an explanation of why the request was not adopted.

As required by § 5.11(b)(4) of 18 CFR, if YCWA has not adopted a request for modification to a proposed study or a request for a new study, YCWA has provided an explanation of why the request was not adopted, with reference to the study request criteria set forth in 18 CFR § 5.9(b).[14] These study request criteria are:

1. Describe the goals and objectives of each study proposal and the information to be obtained;
2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;
3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;
4. Describe existing information concerning the subject of the study proposal, and the need for additional information;
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;
6. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge; and
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.

3.1 Comments on YCWA's Proposed Study Plan

Eight letters from Relicensing Participants providing comments on YCWA's Proposed Study Plan were filed with FERC. Table 3.1-1 below lists, by comment letter, the 29 studies in

[14] For clarity, YCWA has highlighted the major criteria that YCWA believes are relevant to its reply on each request for a study modification or new study. It should not be inferred by YCWA's lack of addressing other study criteria that YCWA believes the criteria have been adequately addressed by the party who requested the study – only that YCWA believes the criteria it has referenced are particularly important to understanding YCWA's reply to the request.

YCWA's Proposed Study Plan for which modifications were requested,[15] and the requests for 11 new studies.

Table 3.1-1. YCWA proposed studies on which one or more modifications were requested and new study requests by commenter. The list below does not include requested modifications to a study proposal that had been previously agreed to by YCWA and Relicensing Participants and for which YCWA posted to its Relicensing Website a redline study proposal (see Section 1.2.14).

YCWA Proposed Study on Which One or More Modifications that Have Already Been Agreed to Are Requested and Requested New Studies		Forest Service	USFWS	NPS	NMFS	CDFG	YCFG	FWN	SWRCB
#	Description								
REQUEST FOR STUDY MODIFICATION									
1.1	Channel Morphology Upstream of Englebright Dam	--	--	--	X	--	--	--[1]	--
1.2	Channel Morphology Downstream of Englebright Dam	--	X	--	X	X	--	--[2]	X[3]
2.2	Water Balance/Operations Model	--	--	--	--	--	--	X	--
2.3	Water Quality	--[2]	--	--	--	X	--	--[2]	X[3]
2.4	Bioaccumulation	--	--	--	--	X	--	--	--
2.5	Water Temperature Monitoring	--	--	--	--	--	--	X	--
2.6	Water Temperature Model	--[2]	--	--	--	X	--	--[2]	--[2]
3.1	Aquatic Macroinvertebrates Upstream of Englebright Reservoir	X	--[2]	--	--	X	--	--[2]	--[2]
3.2	Aquatic Macroinvertebrates Downstream of Englebright Dam	--	X	--	--	--	--	--	--
3.3	Special-Status Aquatic Mollusks	X	--	--	--	--	--	--	--
3.5	Special-Status Amphibians – Foothill Yellow-Legged Frog Habitat Modeling	X	--	--	--	X	--	--[2]	--[2]
3.6	Special-Status Turtles – Western Pond Turtle	X	--	--	--	X	--	--[2]	--[2]
3.7	Reservoir Fish Populations	X	--	--	--	X	--	--[2]	--[2]
3.8	Stream Fish Populations Upstream of Englebright Reservoir	X	--[2]	--	--	X	--	--[2]	--[2]
3.9	Non-ESA-Listed Fish Populations Downstream of Englebright Dam	--	--[2]	--	--	X	--	--[2]	--[2]
3.10	Instream Flow Upstream of Englebright Reservoir	X	X	--	X	X	--	--[2]	--[2]
3.11	Fish Entrainment	X	X	--	--	X	--	--[2]	--[2]
6.1	Riparian Habitat Upstream of Englebright Dam	--	--	--	X	--	--	X	--
6.2	Riparian Habitat Downstream of Englebright Dam	--	X	--	X	--	--	X	--
7.1	ESA-Listed Plants	--	X	--	--	--	--	--	--
7.2	Narrows 2 Powerhouse Intake	--	X	--	--	X	--	--[2]	--[2]

[15] As described in Section 1.2.14 of this Revised Study Plan, in an attempt to ease the burden of the Proposed Study Plan comment process for Relicensing Participants, YCWA posted to its Relicensing Website 16 study proposals that had been included in YCWA's Proposed Study Plan. Each of the study proposals showed redlined modifications to which YCWA and Relicensing Participants had agreed. YCWA has made those agreed-to modifications in this Revised Study Plan. Therefore, unless one of the commenters listed in Table 3.1-1 requested a change to agreed modifications; those modifications are not listed in Table 3.1-1 or discussed further in this section.

Table 3.1-1. (continued)

YCWA Proposed Study on Which One or More Modifications that Have Already Been Agreed to Are Requested and Requested New Studies		Forest Service	USFWS	NPS	NMFS	CDFG	YCFG	FWN	SWRCB
#	Description								
7.3	ESA-Listed Amphibians – California Red-Legged Frog	--	X	--	--	--	--	--	--
7.4	ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle	--	X	--	--	--	--	--	--
7.8	ESA/CESA-Listed Salmonids Downstream of Englebright Dam	--	X	--	X	--	--	--	--
7.9	North American Green Sturgeon Downstream of Englebright Dam	--	X	--	X	X	--	--[2]	--[2]
7.10	Instream Flow Downstream of Englebright Dam	--	X	--	X	--	--	--	--
8.1	Recreation Use and Visitor Surveys	X	--	X	--	--	--	--	--
8.2	Recreational Flow	--	--	X	--	--	--	--	--
10.1	Visual Quality	--	--	X	--	--	--	--	--
Number of Studies for which Modifications Were Requested by Commenter (For this tabulation, support for a study is not considered as a request for that study)		*9*	*12*	*3*	*8*	*14*	*0*	*4*	*2*
Number of Studies for which a Modification Was Requested		*29*							
REQUEST FOR NEW STUDY									
--	Effects of the Project and Related Activities on Fish Passage for Anadromous Fish	--	--	--	X	--	--	--[6]	--
--	Effects of the Project and Related Activities on Hydrology for Anadromous Fish	--	--	--	X	--	--	--[6]	--
--	Effects of the Project and Related Activities on Water Temperature for Anadromous Fish	--	--	--	X	--	--	--[6]	--
--	Effects of the Project and Related Activities on Coarse Substrate for Anadromous Fish	--	--	--	X	--	--	--	--
--	Effects of the Project and Related Activities on Large Wood and Riparian Habitat for Anadromous Fish	--	--	--	X	--	--	--[6]	--
--	Effects of the Project and Related Activities on the Loss of Marine-Derived Nutrients in the Yuba River	--	--	--	X	--	--	--[6]	--
--	Anadromous Fish Ecosystem Effects	--	--	--	X	--	--	--[6]	--
--	Estimating Downstream Migration of *O. mykiss* in the Yuba River	--	X	--	--	--	--	--[5]	--
--	Salmonid Floodplain/Off-Channel Rearing Habitat	--	X	--	--	--[4]	--	--[5]	--
--	Angling Study	--	--	--	--	--	--	X	--

Table 3.1-1. (continued)

YCWA Proposed Study on Which One or More Modifications that Have Already Been Agreed to Are Requested and Requested New Studies		Forest Service	USFWS	NPS	NMFS	CDFG	YCFG	FWN	SWRCB
#	Description								
--	Deer Herd Migration Routes and Mule Deer Winter Range Access Assessment	--	--	--	--	--[4]	X	--	--
Number of Requested New Studies by Commenter		*0*	*2*	*0*	*7*	*0*	*1*	*1*	*0*
Number of Studies for which a New Study Was Requested		*11*							
Total		**40**							

[1] FWN did not specifically propose modifications to the study or specifically request the study, but stated it supported NMFS's requested modifications to the study.

[2] The agency or NGO did not specifically propose any modifications to the study or specifically request the study, but stated it supported CDFG's requested modifications to the study.

[3] In addition to requesting specific modifications to the study, the SWRCB stated it supported CDFG's requested modifications to the study. FWN did not specifically propose this new study, but stated it supported USFWS's request for this new study and provided some rationale for the new study request.

[4] CDFG did not specifically request the new study, but asked FERC to consider the value and need for the study.

[5] FWN did not specifically request the new study, but stated it supported USFWS's request for the new study.

[6] FWN did not specifically request the new study, but stated it supported NMFS's request for the new study and suggested some modifications to NMFS's requested new study and provides additional rationale for the requested new study.

Modifications were not requested for the following 12 studies proposed by YCWA in its Proposed Study Plan:

- Study 2.1 – Hydrologic Alteration
- Study 3.4 - Special-Status Amphibians – Foothill Yellow-Legged Frog Surveys
- Study 4.1 - Special-Status Wildlife – California Wildlife Habitat Relationships
- Study 4.2 – Special-Status Wildlife - Bats
- Study 5.1 – Special-Status Plants
- Study 6.3 – Wetlands
- Study 7.5 – CESA-Listed Plants
- Study 7.6 – CESA-Listed and Fully Protected Wildlife – California Wildlife Habitat Relationships
- Study 7.7 - CESA-Listed and Fully Protected Wildlife – Bald Eagle
- Study 9.1 – Primary Project Roads and Trails
- Study 12.1 - Historic Properties
- Study 13.1 - Native American Traditional Cultural Properties

Of note, seven of the above studies (Studies 3.4, 4.1, 6.3, 7.5, 7.6, 7.7 and 9.1) were also included in YCWA's PAD and no comments were received on these studies when Relicensing Participants filed comments on the PAD (Section 1.2.8 of this Revised Study Plan).

3.2 Replies to Comment Letters

As a general criterion, YCWA has provided below replies to requests to change Section 5.1 (Study Area) and Section 5.3 (Study Methods) of YCWA's study proposals in its Proposed Study Plan, or the study proposal provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. Requested changes in other sections of YCWA's study proposals are not specifically addressed in this section, because those requested modifications do not affect the scope of any proposed study.[16]

One exception to the general criterion above pertains to requested modifications to Section 5.2, General Concepts and Procedures of YCWA's study proposals, which is included as a standard section in most of YCWA's study proposals. These requests are addressed below.

The Forest Service, CDFG, SWRCB and FWN each requested one to three modifications to this standard section. The first requested modification was the addition of a list of target species, which was provided as Attachment 3 to the Forest Service's letter, for incidental observations. YCWA has not made this modification because a longer list of species, not just those listed by the Forest Service, observed incidentally to fieldwork will be noted, and a list of incidental observations will be included in each appropriate final report. However, in acknowledgement of the request, YCWA will make all field crews aware of the specific interest in the species listed in Attachment 3 to the Forest Service's letter.

The second requested modification to Section 5.2 was to add definitions for minor and major modifications to the FERC-approved study. YCWA has not made this modification because YCWA, as required in 18 CFR § 5.15(c), will include in its Initial and Updated study reports a disclosure and description of all modifications, whether minor of major, to the FERC-approved study.

The third requested modification to Section 5.2 pertained to collection of Global Positioning System (GPS) data, development of Geographic Information System (GIS) maps, and making the GIS information available to agencies. YCWA has made this modification in all study proposals except for the ESA-listed species, Historic Properties and Native American Traditional Cultural Properties study proposals. It is anticipated that GIS maps for these studies will include privileged information, which will be made available only to agencies that have a need for the privileged information.

3.2.1 Replies to Comment Letters That Requested Study Modifications

YCWA replies to each of the requested study modifications below by study. In general, for each request, YCWA has indicated which Relicensing Participants requested the modification(s) and stated whether YCWA adopted the request, adopted the request with modification, or did not

[16] It should not be inferred by YCWA's lack of reply to requested modifications in sections other than 5.2 and 5.3 that YCWA has made or not made the modification to that section or that YCWA agrees or disagrees with the requested modification.

adopt the request.[17] For requests adopted with modification or not adopted, YCWA explains the reason why it did not adopt the request in the context of FERC's seven study criteria.

3.2.1.1 Study 1.1 - Channel Morphology Upstream of Englebright Reservoir (*Request for 4 Modifications*)

NMFS requested modifications to YCWA's Channel Morphology Upstream of Englebright Reservoir Study (Study 1.1), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – NMFS requested YCWA modify the study proposal to include a minimum subsurface sample depth, which should be equal to the largest particle on the surface, such as 6 inches (NMFS, Enclosure A, Part 2, p. 32).	**ADOPTED.** YCWA has modified the study proposal to include a minimum subsurface sample depth of 5 inches or equal to depth of surface sample, whichever is greater. Five inches corresponds to the upper size range for the anticipated mobile particles on the surface.
2 - NMFS requested YCWA include in the study proposal the assessment of large woody debris (LWD) in NMFS's Study Request #5 (NMFS, Enclosure A, Part 2, pp. 32 & 33).	**ADOPTED WITH MODIFICATION.** Refer to YCWA's reply to NMFS's new study request named Effects of the Project and Related Activities on Large Wood and Riparian Habitat for Anadromous Fish (aka NMFS Request #5) in section 3.2.2.2. Large woody material (LWM) is being assessed as part of the Riparian Study Plan. Please refer to Study Plan 6-1 Riparian Habitat Above Englebright.
3 - NMFS requested YCWA modify the study proposal by documenting the frequency of time that sediment transport is occurring using the annual flow duration curve (NMFS, Enclosure A, Part 2, p. 33).	**ADOPTED.** It is anticipated that annual exceedance flow duration curves will be used to estimate the amount of time sediment transport occurs under regulated and unimpaired conditions (i.e., a comparison of total number of days critical flows occur under regulated and unimpaired conditions) to estimate total annual sediment transport. The language in Section 5.3.3.3 and 5.3.3.4 has been modified to better reflect this analysis; see also Section 5.3.3.1 in YCWA's study proposal in which it is stated how bedload transport capacity will be estimated.
4 - NMFS requested YCWA include in the study proposal a comparison of sediment supply and sediment transport capacity under unimpaired and regulated conditions in data analysis (NMFS, Enclosure A, Part 2, p.34).	**NOT ADOPTED.** YCWA has not adopted NMFS's request because NMFS has not shown that YCWA's proposed study does not meet the stated information needs or justified the level of effort and cost to collect the requested information given the existing information and lack of salmon in the study area (Study Criterion 7). Sediment supply prior to dam construction ("unimpaired") is not relevant as the purpose of the study is to assess the baseline (i.e., current) conditions. Sediment supply and coarse sediment storage is being assessed and these estimates will be used in the analysis when the discussion is about changes in sediment transport capacity due to regulation.

3.2.1.2 Study 1.2 - Channel Morphology Downstream of Englebright Dam (*Request for 14 Modifications*)

NMFS, USFWS, CDFG and the SWRCB requested modifications to YCWA's Channel Morphology Downstream of Englebright Dam Study (Study 1.2), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

[17] YCWA has not included in the text by study a list of any Relicensing Participants that may have not specifically requested the study but stated support for another Relicensing Participants request. Refer to Table 3.1-1 for that information.

Requested Modifications	YCWA's Reply
1 – USFWS requested that YCWA include a discussion on how the study information will be used to develop protection, mitigation, and enhancement measures (USFWS, p. 3).	**NOT ADOPTED.** YCWA does not intend to incorporate into the study proposal methods for evaluating Project effects since Relicensing Participants have expressly stated that they view the relicensing studies as data gathering, not an impacts evaluation, and prefer the study reports provide the study data only. Relicensing Participants said they prefer that an assessment of Project effects not be included in the study, but that each Relicensing Participant is free to conduct its own assessment using the data from the study. YCWA has honored that request in its study proposals.
2 - USFWS requested that YCWA clarify on-going effects to channel morphology of sediment storage behind Project dams (USFWS, p. 3).	**ADOPTED WITH MODIFICATION.** Sediment capture behind Project dams is addressed in YCWA's proposed the Channel Morphology Upstream of Englebright Reservoir (Study 1.1) YCWA does not propose to collect data regarding sediment entrapment by the USACE's Englebright Dam, because: 1) Englebright Dam is not a Project facility; 2) Englebright Dam is a debris dam constructed with the express intent to stop downstream movement of sediment; and 3) existing information is available regarding the amount of sediment stored behind and captured by Englebright Dam.
3 – USFWS requested that "uncontrolled" be added to objective 4 as "uncontrolled spill flow effects…." (USFWS, p. 3).	**NOT ADOPTED.** Licensee believes that analysis of both controlled and uncontrolled spills will be necessary to fully assess channel morphology downstream of Englebright Dam; thus specifying only uncontrolled spill effects is unduly limiting.
4 – USFWS requested that study area include unconfined, lowland river reaches (USFWS, p. 3).	**NOT ADOPTED.** It is not clear what is meant by the terms "unconfined, lowland river reaches" in this request. The current study area includes the Yuba River from Englebright Dam to the Feather River, which includes all of the areas accessible to the river from minimum flow up to maximum flood stage.
5 – USFWS requested that analysis of floodplain and riparian vegetation conditions and processes be added as a specific study objective (USFWS, p. 3).	**NOT ADOPTED.** As described above, YCWA believes that analysis of both controlled and uncontrolled spills will be necessary to fully assess channel morphology downstream of Englebright Dam. Assessment of both controlled and uncontrolled spills will necessarily include "floodplains" thus a specific objective is not required. Assessment of riparian vegetation downstream of Englebright is addressed in YCWA's proposed Riparian Habitat Downstream of Englebright Dam (Study 6.2), so study objectives for riparian vegetation are addressed there.
6 – USFWS suggested the following wording in the "Analysis" section: "Identification/ definition of flow threshold for geomorphically significant events." (USFWS, p. 3).	**ADOPTED.** See responses to NMFS requested modifications, # 9 and #10 below.
7 – NMFS requested a description of the sediment transport, data input, model and analyses to be used for bed mobility (NMFS, Enclosure A, Part 2, p. 36).	**ADOPTED**. NMFS requested a description of the sediment transport, data input, model and analyses to be used for bed mobility. As has been discussed with NMFS and with other Relicensing Participants in various meetings in early 2011, the RMT has developed a comprehensive 2D model for the entire Yuba River downstream of Englebright Dam. That model predicts the spatial pattern of depth and velocity at specific flows between approximately 300 cfs and 110,000 cfs, with some different limits in different sections of the lower Yuba River. Using those data and other available inputs, the 2D model can predict sediment transport capacity in terms of bed shear stress and a non-dimensional shear-stress variable called Shields stress that accounts for the local bed material distribution. For the Yuba River downstream of Englebright Dam, the following analytics will be completed: • Calculate bed shear stress at each node in the 2D model. • Define a representative spawning bed-material size for a heterogeneous gravel/small cobble mixture and calculate the non-dimensional Shields stress (τ^*). • Shields stress values are binned where values of $\tau^* < 0.01$ correspond to negligible transport, $0.01 < \tau^* < 0.03$ correspond to intermittent entrainment, $0.03 < \tau^* < 0.06$ corresponds to partial transport, and $\tau^* > 0.06$ corresponds to full transport of a carpet of sediment $1\text{-}2 \cdot d_{90}$ thick, where d_{90} is the size that 90% of the surficial bed material is smaller than. • Use the available hydraulic regime to estimate the local critical particle size at the incipient-motion threshold for a given reach, wherein a Shields stress of 0.045 is utilized to identify the initiation of motion for particles size(s) of interest.
8 – NMFS requested an analysis of at what discharges geomorphic processes such as bar erosion and deposition, bank erosion, and channel migration occur (NMFS, Enclosure A, Part 2, p. 36).	**ADOPTED**. The approach of using the existing 2D model to define Shields stress and resultant mobility analysis will be relevant to a geomorphic process analysis. Return interval and duration analysis of flows that achieve full bed mobility for specific morphological units will define the frequency of flows that induce geomorphic processes associated for those units. For example, the occurrence of a median Shields stresses over 0.045 for a given discharge for lateral and/or medial bar units would indicate the discharge threshold for bank erosion. The same criteria for point bars would indicate channel migration. Similar geomorphic functions can be assessed for each morphological unit type (e.g., pool-riffle rejuvenation).

Requested Modifications	YCWA's Reply
9 – NMFS requested an analysis of the rate of sediment export or erosion, either through measured sediment volume or sediment transport capacity and compared to existing sediment supply, unimpaired sediment supply and existing in-channel sediment storage volumes (NMFS, Enclosure A, Part 2, pp. 36 & 37).	**ADOPTED**. DEMs now exist for 1998-1999 and 2006-2009. Subtraction of DEMs between years to develop DEMs of Difference (DoDs) will be utilized for the Yuba River downstream of Englebright Dam to determine temporal patterns of scour and fill as well as total export volumes. Uncertainty analysis is required to determine what scour and fill is likely to be real and not an artifact of surveying, interpolation, or propagation errors. Specific tasks will include: • Develop DEM's and DoD's for all reaches of the LYR for the 1999 – 2009 time period (the time period when suitably accurate elevation data is available for the river). • Calculate total and net deposition and scour for each reach (reaches as defined by the RMT) and each morphological unit.
10 – NMFS requested an analysis of channel morphology evolution due to erosion of the channel from lack of sediment input (NMFS, Enclosure A, Part 2, p. 37).	**ADOPTED**. The DEM and DoD analytic approach to be utilized for the LYR will also be able to address changes in morphologic features through time. The 2D model will reveal the tendencies of river reaches and morphological units to scour at specific flows. Additionally, the historic aerials analysis underway by James et. al. will provide an assessment of geomorphic change through time. Products will include development of DoD maps for all reaches of the Yuba River below Englebright Dam for the 1999 – 2009 time period, the time period when suitably accurate elevation data is available for the river, showing areas of change including areas of routine vs. occasional recruitment and change and an estimate of volume of change.
11 – NMFS requested additional analysis of substrate characterization and how YCWA will evaluate changes to grain size distribution in response to high flow alterations (NMFS, Enclosure A, Part 2, p. 37).	**ADOPTED**. The existing substrate map of the Yuba River downstream of Englebright Dam was developed by compiling a "facies" map of the surficial pattern of substrate using defined substrate size classifications, with each area of a homogeneous substrate type mapped as a polygon. Polygons of 10 x 10 m minimum size were mapped, and each substrate classification for each polygon was defined to the nearest 10 percent. Unavoidable gaps between mapped polygons were filled by associating each point in the river with the attributes of the nearest characterized polygon. Additional substrate data can be polled from pre-existing studies and three years of redd observations, wherein substrate utilized for spawning was characterized using the same substrate classification bins. Substrate analytics will include: • Relative substrate distribution by reach • Relative substrate distribution by morphologic unit • Substrate size distribution for spawning
12 – NMFS requested additional description and analyses to quantify LWD frequency and geomorphic role (NMFS, Enclosure A, Part 2, p. 37).	**ADOPTED WITH MODIFICATION**. NMFS requests that the study plan address "quantify LWD (Large Woody Debris) frequency and how LWD functions as a geomorphic control and forcing mechanism in the LYR (Lower Yuba River)". As described in the PAD and elsewhere, Englebright Dam is not a Project facility, nor does Englebright Dam preclude the transport of LWD from the upper reaches of the Yuba Watershed to the lower Yuba River since Englebright Dam is an overflow bypass structure and USACE does not remove LWD from Englebright Reservoir. YCWA's New Bullards Bar Reservoir does act as a barrier to LWD; however LWD impacts of New Bullards Bar Reservoir are addressed in other study plans (e.g., Study 1.1, Channel Morphology Upstream of Englebright Reservoir). NMFS in the study plan request does not show how LWD frequency would, therefore, be a Project effect, or have a Project nexus, or why proposed studies would not be adequate, and therefore this study element of the study request does not meet Criteria 5 or 7. Additionally, as described in the PAD and elsewhere, the Yuba River downstream of Englebright Dam is a wide gravel bed river, with a mean valley width generally between 500 and 1,500 ft and with vast perched sediment terraces and areas of minimal vegetation (PAD; Existing Information Attachment, Fluvial Geomorphology Downstream of Englebright Dam, Sept 2010). It is not clear how a characterization of "LWD… as a geomorphic control and forcing mechanism in the LYR" has a specific nexus, and therefore this study element of the study request also does not meet Criterion 5. However, YCWA is planning on a characterization of LWD presence and distribution in the Yuba River downstream of Englebright Dam by completing the following analysis: • Provide a 'snapshot' inventory of large wood pieces by digitizing identifiable stream wood within the 5,000 cfs wetted area based on existing 1' aerial imagery for the entire river corridor between Englebright Dam and the Feather River confluence. • Assess whether the longitudinal distribution of stream wood is random or organized using simple longitudinal distribution analysis. • Stratify stream wood by reach and morphological unit to assess what landforms it tends to be associated with. • Intersect stream wood polygons with the lower Yuba River wetted area polygons up to 5,000 cfs to determine what flows access the available wood.

3.2.1.3 Study 2.2 – Water Balance/Operations Model *(Request for 1 Modification)*

FWN (FWN, P. 16) requested modifications to YCWA's Water Balance/Operations Model Study (Study 2.3), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – FWN requested that the study goals include quantification, including frequency, duration and magnitude of diversions at and through Project facilities where the diversion has no benefit. As an example, FWN describes diversions through the Camptonville and Lohman Ridge tunnels to New Bullards Bar Reservoir when New Bullards Bar Dam is spilling. FWN states that this information is needed so that alternatives, including new gates to control diversion into Lohman Ridge Tunnel, can be developed to improve the control of diversions at Our House Diversion Dam. (FWN, p. 16.)	**ADOPTED.** YCWA's proposed study will provide the information requested by FWN. The study proposed by YCWA will result in a Water Balance/Operations Model that simulates Project operations on a daily time step under various conditions. Among other information, model output will include diversions at Lohman Ridge and Camptonville tunnels and spills at Our House, Log Cabin and New Bullards Bar dams – regardless of whether someone might characterize the diversions as beneficial or with "no benefit." Therefore, one will be able to examine how diversions at the tunnels correlate with spills at New Bullards Bar Dam. This information will be adequate to address license requirements. In addition, YCWA wishes to address the statement by FWN that the gate at the intake to the Lohman Ridge Diversion Tunnel is "outdated and dilapidated." This structure is wholly adequate to operate the facility in conformance with all design criteria and license requirements, is inspected daily to weekly by YCWA O&M staff, annually by FERC staff, and every 5 years by an independent dam safety inspector. None of these inspections, which are performed by engineers qualified to determine the condition of the structure, have ever indicated that the structure is less than adequate to perform the function for which it is used.

3.2.1.4 Study 2.3 – Water Quality *(Request for 2 Modifications)*

CDFG and the SWRCB requested modifications to YCWA's Water Quality Study (Study 2.3), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 - CDFG requested YCWA modify its study proposal to add one general water quality sampling site on the Middle Yuba River near the Forest Services' Oregon Creek Day Use Area (CDFG, Enclosure A, Redlined Study 2.3, Table 5.3.2-2, p. 11).	**NOT ADOPTED.** The need for this information is not described (Criterion 4). CDFG's stated nexus is not applicable - if water adjacent to the Oregon Creek Day Use Area is polluted, it is the polluter's responsibility and dilution is not the solution (Criterion 5). How the information would inform license conditions is not described (Criterion 5). YCWA's proposed study plan requires YCWA sample surface water upstream and downstream of the Forest Service's Oregon Creek Day Use Area at locations proximate to Project facilities where Project effects may be discernable; CDFG does not state why YCWA's proposed study plan is insufficient to meet the stated information needs (Criterion 7). YCWA notes that the Forest Service's Oregon Creek Day Use Area is not a Project facility, occurs along a major State highway (Highway 49), was constructed by the Forest Service prior to the Project's construction, is maintained by the Forest Service, is not accessed by a Project road, and is over 2 miles from any Project facility. Nevertheless, in two of its study plans, YCWA identified two triggers for further bacteria sampling at the Forest Service's Oregon Creek Campground, if warranted. In YCWA's Recreation Use and Visitor Surveys Study proposal (Study 8.1), YCWA and the Forest Service agreed YCWA would collect use information at the campground and, if the information indicated that use at the recreation area was affected by the Project, additional information, including water quality, would be collected at the campground. This agreement is also described in Section 5.3.2.2 of YCWA's proposed Water Quality Study that states: "If Licensee and Relicensing Participants collaboratively identify additional locations of concern regarding Project-related bacteria during the Recreation Use and Visitor Surveys Study (Study 8.1), additional recreation related bacteria sampling will be performed at those locations."

Requested Modifications	YCWA's Reply
2 - CDFG requested YCWA modify its study proposal by adding bacteria sample collection at four additional locations: at Our House Diversion Pool, at the Forest Service's Oregon Creek Day Use Area, at Log Cabin Diversion Pool, and on the Yuba River, at Lake Francis Road. (CDFG, Enclosure A, Redlined Study 2.3, Table 5.3.2-3, p. 12).	**NOT ADOPTED** – CDFG has not described the need for this information (Criterion 4), the nexus to the Project, or how the information would inform license conditions (Criterion 5). Without a continuous source, such as a leaking septic system or an out-of-compliance wastewater treatment plant, human-related bacteria would not be discernable in flowing water, which is the condition at each of the four locations where CDFG requests additional bacteria sampling. Our House Dam Diversion Dam impoundment and Log Cabin Diversion Dam impoundment do not store water; the impoundments create headwaters for Project diversions and water is flowing within these areas at all times (See Section 7.2 of PAD). The water's residence time is on the order of minutes. The "Yuba River near Lake Francis Rd." is outside of the FERC Project Boundary and water is always flowing at this location. Similarly, water is always flowing near the Log Cabin Campground, which is also not a Project facility, is located outside of the FERC Project Boundary, was constructed by the Forest Service prior to the Project's construction, is maintained by the Forest Service, is not accessed by a Project road, and is over 2 miles from any Project facility. Regarding Forest Service's Oregon Creek Campground and Day Use Area, as described above, YCWA has agreed to perform additional sampling at this location if YCWA's Recreation Use and Visitor Surveys Study proposal (Study 8.1) establishes a nexus to the Project at this facility.

3.2.1.5 Study 2.4 - Bioaccumulation *(Request for 1 Modification)*

CDFG requested modifications to YCWA's Bioaccumulation Study (Study 2.4), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
2 - CDFG asserts that a secondary objective of the Bioaccumulation Study is to assess mercury's risk to piscivorous birds (CDFG, Enclosure A, Redlined Study 2.3, Table 5.3.2-3, p. 12). p. 42, Section 3.0)	**ADOPTED.** At the August 10, 2011 Relicensing Participants meeting, CDFG clarified that this was not a request for a study modification. However, YCWA has noted it here as adopted since it was addressed at the meeting. Since it was not a request for a change to study scope, YCWA did not include the wording in the study.

3.2.1.6 Study 2.5 – Water Temperature Monitoring *(Request for 1 Modification)*

FWN (FWN, pp. 20 & 21) requested modifications to YCWA's Water Temperature Monitoring Study (Study 2.5), which is provided in YCWA's Proposed Study Plan.[18] A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – FWN requests the study proposal be modified to add enough additional water quality sampling locations in New Bullards Bar Reservoir so that reservoir coldwater pool dynamics can be thoroughly characterized. FWN does not request a specific modification. (FWN, pp. 20 & 21).	**NOT ADOPTED.** YCWA has not adopted FWN's requested modification because FWN has not explained why YCWA's study proposal will not provide the requested information (Study Criteria 7). As accurately stated by FWN, YCWA's proposed Water Temperature Monitoring Study includes bi-monthly (i.e., every 2 weeks) profiling of water temperature at one location in New Bullards Bar Dam near the dam and two locations in Englebright Lake , near the dam and about 3.3 miles upstream of the dam. FWN stated that this sampling is not adequate to accurately characterize the cold water pool and develop strategies to manage the pool. However, FWN has not stated why it believes the sampling is inadequate or suggested what sampling would be adequate. YCWA believes the information to be collected in YCWA's proposed Water Temperature Monitoring Study and Water Temperature Model Study will be adequate to

[18] Note that the title of the section in FWN's letter under which this request is made is "Water Temperature Monitoring and Modeling Studies." YCWA has addressed FWN's request under the Water Temperature Monitoring Study since the request pertains to temperature monitoring, which is addressed in that study proposal.

examine the coldwater pool dynamics in New Bullards Bar Reservoir because previous analysis for the Yuba Accord Environmental Impact Report demonstrated that this could be done with data from one sampling location in New Bullards Bar Reservoir. In addition, New Bullards Bar Reservoir has an extremely high depth-to-area ratio and, therefore, exhibits a very stable cold water pool. For Englebright Reservoir, previous work on development of a grant application to CALFED for the Narrows 2 Intake Extension demonstrated that data from one sampling location was adequate to characterize the release temperatures below Englebright Dam, and YCWA proposes to monitor two locations to be conservative. The second location for monitoring is 3.3 miles upstream of the Englebright Dam located at the upper extent of the deep extent of the reservoir. The second site will better characterize any longitudinal variation in the thermal regime of the reservoir.

3.2.1.7 Study 2.6 – Water Temperature Model *(Request for 1 Modification)*

CDFG requested modifications to YCWA's Water Temperature Model Study (Study 2.6), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – CDFG requests that the study specific consultation be modified to further detail a collaborative approach to the modeling process that includes a technical work team and meetings during calibration and validation. (CDFG redlines of Water Temperature Model Study Plan page 12)	**ADOPTED.** YCWA agrees to include these additional collaborative actions during model development and include CDFG's redlined comments in the modified study proposal.

3.2.1.8 Study 3.1 – Aquatic Macroinvertebrates Upstream of Englebright Reservoir *(Request for 1 Modification)*

The Forest Service and CDFG requested modifications to YCWA's Aquatic Macroinvertebrates Upstream of Englebright Reservoir Study (Study 3.1), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 - The Forest Service and CDFG requested that YCWA's proposed study be modified to add seven additional sampling sites as "reference" sites to eight sites proposed by YCWA in its study proposal. The seven requested new sites are all outside of the Project Area and would be used as "references" (Forest Service, pp. 5 & 6; CDFG, Enclosure A, p. 5 & 9 of redline of Study 3.1).	**NOT ADOPTED**. Neither the Forest Service nor CDFG have explained why YCWA's study proposal is not sufficient to meet the information needs (i.e., adequate to identify Project effects on benthic macroinvertebrates), or why almost doubling the study costs (from 8 sites to 15 sites) is needed (Study Criterion 7). Both YCWA's study proposals and the study proposals requested by the Forest Service and CDFG specify that benthic macroinvertebrate sampling occur in conformance with the SWRCB's Surface Water Ambient Monitoring Program (SWAMP). This protocol develops a site-specific index, which is based on a ranking of the site to all other sites embedded in the index. The index identifies if impairment exists at the sampled site and, if so, the magnitude of the deficiency. In addition, YCWA's study proposal includes, as requested by agencies, that the SWAMP index would be further compared to other indices as developed by Rehn (2009). Both indices indicate if a site is "impaired" and, if so, in what way. Therefore, the addition of "reference" sites to the study is not needed. Further, neither the Forest Service nor CDFG have provided any evidence to suggest that their request is consistent with generally accepted practices in the scientific community (Study Criterion 6). The SWAMP protocol does not require that the SWAMP indices for each SWAMP site be compared to a "reference" site in the watershed.

3.2.1.9 Study 3.2 – Aquatic Macroinvertebrates Downstream of Englebright Dam *(Request for 1 Modification)*

USFWS requested modifications to YCWA's Aquatic Macroinvertebrates Downstream Downstream of Englebright Dam Study (Study 3.2), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – USFWS requested that the modifications proposed by CDFG to YCWA's Aquatic Macroinvertebrates Upstream of Englebright Dam (Study 3.2) be applied to YCWA's Aquatic Macroinvertebrates Downstream of Englebright Reservoir (Study 3.1) (USFWS, p. 4).	**NOT ADOPTED**. USFWS has not addressed any of FERC's Study Criteria, or provided any rationale for its request. Further, YCWA notes that CDFG, recognizing the inherent differences between the Yuba River upstream and downstream of Englebright Dam did not request any modifications to YCWA's Aquatic Macroinvertebrates Downstream of Englebright Dam Study. USFWS has not identified how its request is consistent with generally accepted practices in the scientific community (Study Criterion 6). In fact, it is not. USFWS requests that CDFG's requested changes to YCWA's Aquatic Macroinvertebrates Upstream of Englebright Reservoir Study proposal be applied to YCWA's Aquatic Macroinvertebrates Downstream of Englebright Dam Study proposal. The upstream study uses the SWRCB's SWAMP protocol, the use of which for that study has been agreed to by all Relicensing Participants. The SWAMP method is specific to wadeable streams, not non-wadeable rivers such as the Yuba River downstream of Englebright Dam. Therefore, the application of that protocol is not consistent with generally accepted practices in the scientific community. In addition, USFWS has not explained why YCWA's study proposal is not sufficient to meet the stated information needs (Study Criterion 7). Given that the SWAMP protocol may not be reliably applied to the lower Yuba River, YCWA has proposed a large river bioassessment protocol that is a standard method for streams that cannot be waded.

3.2.1.10 Study 3.3 – Special-Status Aquatic Mollusks *(Request for 1 Modification)*

The Forest Service (Forest Service, p. 4) requested modifications to YCWA's Special-Status Aquatic Mollusks Study (Study 3.4), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – The Forest Service requested that the study proposal be modified to recognize that the Forest Service is considering including 10 additional species to the Forest Service's Sensitive Species list, and that YCWA will consult with Relicensing Participants prior to initiating fieldwork and report preparation to confirm the status of the 10 species (Forest Service, Attachment 1, p. 4).	**ADOPTED**. YCWA has modified the study proposal to include the Forest Service's request, but has clarified that the formal addition of a mollusk species to the Sensitive Species list after fieldwork has begun will not require that YCWA go back into the field to survey for the added species. The change in status will be noted in YCWA's technical report for the study and indicate that the status change occurred after the study began. YCWA notes that this process is standard practice in relicensing studies.

3.2.1.11 Study 3.5 – Special-Status Amphibians – Foothill Yellow-Legged Frog Habitat Modeling *(Request for 1 Modification)*

The Forest Service (Forest Service, Attachment 1, p. 5) and CDFG (CDFG, Enclosure A, redlined study request) requested modifications to YCWA's Special-Status Amphibians –

Foothill Yellow-Legged Frog Habitat Modeling Study (Study 3.5), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – The Forest Service and CDFG requested that Step 1, Site Selection, be modified to state that the selection of FYLF modeling sites would occur immediately following the breeding surveys in spring 2012, as specified in the Special-Status Amphibians – FYLF Surveys Study, and will occur in summer 2012 to coincide with site/transect selection for the Instream Flow Upstream of Englebright Study. Further, the Forest Service requests the study state that modeling will occur at known breeding sites. (Forest Service, Attachment 1, p. 5; CDFG, Enclosure A, Redlined Study 3.5, p. 6).	**ADOPTED WITH MODIFICATION**. As background and as stated in Section 1.2.10 of the Revised Study Plan, YCWA with agreement from Relicensing Participants began the Special-Status Amphibians – FYLF Surveys Study (Study 3.4) in early 2011 in advance of FERC's Study Determination, but suspended work on the study, except in Oregon Creek, when agencies advised YCWA that they would require the fieldwork be redone in 2012 since 2011 was atypically wet. Note that YCWA does not believe the Oregon Creek fieldwork needs to be repeated since hydrologic conditions in that stream were not atypical in 2011. At this time, YCWA intends to select sites/transects for the Instream Flow Upstream of Englebright Study in fall 2011 following FERC's Determination and assuming the study is not disputed. YCWA has modified the study proposal to state that the Oregon Creek FYLF modeling site will be selected in fall 2011 coincident with the site/transect selection in Oregon Creek for the Instream Flow Upstream of Englebright Study; and that the remaining FYLF model sites will be selected in late spring/summer 2012 following completion of the breeding surveys for the Special-Status Amphibians – FYLF Surveys Study. Modeling will occur as described in the proposed study plan, which states that there will be one site in each of three stream reaches if breeding is documented in the reach. Ideally the modeling site will be situated where breeding has been documented. However, if surveys only detect FYLF tadpoles (i.e., egg masses not detected), which could have moved downstream from a breeding site, YCWA and the Relicensing Participants might agree to place the modeling site elsewhere in the reach. The study plan does not require a modeling site at each known breeding location.

3.2.1.12 Study 3.6 - Special-Status Turtles – Western Pond Turtle *(Request for 2 Modifications)*

The Forest Service and CDFG requested modifications to YCWA's Special-Status Turtles – Western Pond Turtle Study (Study 3.6), which was provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – Forest Service and CDFG requested that the study area be expanded to include two stream reaches upstream of the Project diversions/reservoirs and not directly affected by the Project, to provide comparative information for assessing WPT population status within the Project area and aid in understanding potential entrainment effects of Project tunnels. The proposed stream reaches include Oregon Creek immediately upstream of Log Cabin Diversion Dam Impoundment and a stream reach in the Yuba River watershed with comparable geomorphic attributes to some of the larger Project-affected streams. (Forest Service, Attachment 1, p. 6; CDFG, Enclosure A, Redlined Study 3.6, p. 5).	**NOT ADOPTED** - The Forest Service and CDFG have not established a Project nexus to the area upstream of the Project facilities or how the information from studies outside Project-affected areas would inform license requirements (Study Criterion 5). Although general comparisons to WPT populations in other locations may be informative, YCWA disagrees that collecting data from "reference sites" should be part of this study. Interpretation of data from areas outside of Project influence is confounded by differences in stream geomorphology within Project-affected areas and in comparison to potential reference sites, and similar site-specific variability in historical and current anthropogenic factors such as mining, recreation, residential development, and introduced species. It is unclear how Project effects could be isolated and apportioned relative to these other factors. The expansion of the study area requested by the Forest Service and CDFG for upstream and downstream of the diversions is not pertinent to an assessment of entrainment and is not warranted. Ashton et al. (1997) indicate that individual WPT "exhibit a high degree of site fidelity, in both aquatic and terrestrial environments…[with occasional] sporadic long-distance aquatic movements outside their home range (Holland 1994)." This suggests that exposure to the risk of entrainment would be largely localized to the areas of the diversions and that studies of more distant areas are not justified. A comparative demographic study further supposes that any differences in demography would be related to entrainment or other possible effects of the Project, which is an uncertain assumption that makes the results of such studies questionable. .

Requested Modifications	YCWA's Reply
2 – Forest Service and CDFG requested that the study be modified to include more detailed studies of potential WPT entrainment in the second year of the WPT study. Specific parts include 1) intensive visual observations of WPT to assess their use of reservoir areas near Lohman Ridge diversion tunnel and Camptonville Diversion tunnel entrances, and 2) PIT-tagging of WPT that are found within the vicinity of Lohman Ridge diversion tunnel and Camptonville Diversion tunnel entrances. Part 1 consists of 2-hour long visual surveys on 3 days at each tunnel entrance timed to occur when water is being diverted into the tunnels and after WPT have been confirmed to have moved to the reservoirs. Part 2 consists of trapping or hand-capturing WPT and implanting PIT tags in at least 10, and up to 20 WPT found in the immediate vicinity of each tunnel entrance (or elsewhere within each reservoir, if 10 cannot be captured in the immediate vicinity). (Forest Service, Attachment 1, p. 6-7; CDFG, Enclosure A, Redline Study 3.6, pp. 9 & 10.)	**NOT ADOPTED** - As proposed by the Forest Service and CDFG, Study 3.6 would be a two-year study, with the second year focused on evaluating WPT entrainment provided that there are detections of WPT in either diversion impoundment in the first year. YCWA believes this approach is premature and has instead proposed a one-year study which will include visual surveys for WPT in the diversion impoundments during periods when the diversions are operating. If the results of the study indicate that there is a risk of WPT entrainment, a new study would be collaboratively developed appropriate to the study findings. Inclusion of an entrainment study is not justified for two reasons. First, the Forest Service and CDFG have not established that entrainment of WPT is likely to occur (Study Criterion 4). The Forest Service and CDFG have suggested that an entrainment study is warranted at this time because the diversion impoundments provide potential habitat for WPT and because WPT may be present within the impoundments during at least part of the period in which the Project diverts water into the Lohman Ridge and Camptonville diversion tunnels. Stream-dwelling WPT typically leave stream environments in the autumn and over-winter on land (Reese 1996, Goodman 1997), which may be an adaptation to escape or avoid high flow conditions (Ashton et al. 1997), although they could return prior to the end of the high flow period and thus be present when the Project is diverting. However, the presence of WPT in the impoundments is not alone sufficient evidence of entrainment risk. Unlike fish, which inhabit the water column and often feed near high velocity areas, WPT inhabits areas near stream banks in backwaters and slow-moving water, particularly where suitable basking substrates and closely associated underwater hiding places, such as under rocks, logs, or undercut banks, are present. This species spends long periods basking out of the water, which greatly limits the potential for entrainment, particularly when water temperatures are low, as they tend to be during high flow periods in spring and early summer. Potential exposure to entrainment is also likely limited by WPT foraging behavior, which includes scavenging on carrion; browsing on plants in shallow, slow-moving water; taking floating food objects at the surface; feeding within algal mats; feeding along the bottom in leaf litter and detritus; and filter-feeding microcrustaceans (Holland 1985, Bury 1986, Holland and Bury 1998). Areas near the Project tunnel intakes do not possess suitable habitat features for WPT, such as basking sites, hiding cover, or shallow, vegetated edges for foraging. Entrainment of juvenile WPT is particularly unlikely because juveniles do not occur in deep, open water areas, such as the intake gate areas, and instead occupy shallow (less than 30 cm deep), still-water habitats with ample cover, such as emergent or aquatic vegetation, or rocks under which they can hide. Nonetheless, YCWA has included within the Revised Study Plan, visual surveys of WPT in the two impoundments to determine whether WPT occur in areas where they could be entrained and surveys for juvenile WPT in the impoundments. Second, the methods that the Forest Service and CDFG have proposed for the study in "Part 2" are not scientifically sound or consistent with generally accepted practices (Study Criterion 6). Specifically, the use of PIT (passive integrated transponder) tags to monitor entrainment will not yield valid results. YCWA has previously explained the shortcomings of this method during a field visit where telemetry experts were invited to comment on monitoring methods proposed by the agencies to assess fish entrainment at the two diversions. The experts stated that the use of PIT monitoring would not be effective at the intakes because of excessively deep water and proximity to metal grating. PIT monitors can detect tags up to a maximum of 4 feet in water under optimal environments, whereas water depth at the intakes is up to 15 feet and the metal grating of the intakes would interfere with PIT monitoring detectors, reducing detection ranges. Antennas can be combined (multiplexed) to achieve greater coverage, but only one antenna can be active at a time. As such, there would be significant gaps in the detection area. Scientists generally only multiplex two antennas due to the on/off requirements of the monitoring system and the complexities of maintaining the system. The Forest Service and CDFG have not addressed how these technical obstacles would be overcome and, therefore, the application of the method is not justified.

YCWA requests FERC note that at the August 10, 2011 Relicensing Participants meeting, YCWA, the Forest Service and CDFG agreed to continue discussing technical approaches to entrainment monitoring at the intakes to the Lohman Ridge and Camptonville diversion tunnels. These discussions will include WPT. YCWA will keep FERC apprised of these discussions.

3.2.1.13 Study 3.7 - Reservoir Fish Populations *(Request for 1 Modification)*

The Forest Service and CDFG requested modifications to YCWA's Reservoir Fish Populations Study (Study 3.7), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – The Forest Service and CDFG requested that YCWA modify the study proposal to state that YCWA will consult with the Forest Service and CDFG regarding boat electrofishing and gill netting sites in New Bullards Bar and Englebright reservoirs (Forest Service, Attachment 1, p. 8; CDFG, Enclosure A, p. 6 of Study 3.7 redline).	**ADOPTED.** YCWA believes that the request is not needed since YCWA's study proposal already states that following reservoir reconnaissance, YCWA will collaborate with the Forest Service and CDFG to select appropriate sampling locations for boat electrofishing and gill netting in New Bullards Bar and Englebright reservoirs (pp. 6 and 11 of YCWA's study proposal). YCWA notes that it modified the above statement to limit collaboration regarding Englebright Reservoir to CDFG – Englebright Reservoir is not on federal land managed by the Forest Service nor is there any federal land managed by the Forest Service downstream of Englebright Reservoir. Nevertheless, YCWA will invite the Forest Service to participate in the Englebright Reservoir electrofishing and gill net site selection.

3.2.1.14 Study 3.8 – Stream Fish Populations Upstream of Englebright Reservoir *(Request for 1 Modification)*

The Forest Service and CDFG requested modifications to YCWA's Stream Fish Populations Upstream of Englebright Reservoir Study (Study 3.8), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – The Forest Service and CDFG requested that, to "have clearer results," YCWA should modify its study proposal to move the two fry emergence sampling sites from downstream of Our House and Log Cabin diversion dams to upstream of each dam. (Forest Service, Attachment 1, p. 8; CDFG, Enclosure A, p. 9 of Study 3.8 redline).	**ADOPTED**. At the August 10, 2011 Relicensing Participants meeting, YCWA agreed to move the two fry emergence sampling sites from downstream of Our House and Log Cabin diversion dams to within one mile upstream of each dam, for a total of two sampling sites (i.e., the sites were a relocation of the two sites in YCWA's study proposal, not in addition to the two sites downstream of the dams). Also, YCWA, Forest Service and CDFG agreed the upstream extent of each site would be no more than 1 mile.

3.2.1.15 Study 3.9 – Non-ESA Fish Populations Downstream of Englebright Dam *(Request for 2 Modifications)*

CDFG requested modifications to YCWA's Non-ESA Fish Populations Downstream of Englebright Dam Study (Study 3.9), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – CDFG requested that the study proposal be modified such that for the purposes of this study, Forest Service Sensitive Species be considered special-status fish species (CDFG, Enclosure A, Redlined Study 3.9, p. 1).	**NOT ADOPTED**. YCWA has not adopted CDFG's request. CDFG has not addressed any of FERC's Study Criteria, or provided any rationale for its request. All fish species, including those not considered special-status species that are found to occur in the lower Yuba River will be identified. CDFG has not stated which species designated by the Forest Service as Sensitive are likely to occur in the lower Yuba River, or provided any rationale for why if these species are found, they should be considered special-status, since National Forest System land does not occur in the lower Yuba River, and hence the Forest Service has no jurisdiction there. Also, YCWA notes that the Forest Service has not made a similar request in its comment letter.

Requested Modifications	YCWA's Reply
2 – CDFG requested that the study proposal be modified to provide for a collaborative review and evaluation of compiled data to identify data gaps relative to meeting the study goals, and to identify, develop and implement any additional studies needed to fill the data gaps. Proposed collaboration would be among the Forest Service, USFWS, NMFS, CDFG and SWRCB, and would include input from Relicensing Participants (CDFG, Enclosure A, Redlined Study 3.9, p. 18).	**ADOPTED WITH MODIFICATION**. CDFG has not described why YCWA's study proposal is not adequate to meet the stated information needs (Criterion 7). YCWA notes that the ILP provides that all Relicensing Participants and FERC review the study information and may request additional studies based on the information and other considerations. Relicensing Participant review of study results and analysis and input on results, including identifying the need for additional information, is a fundamental component of the ILP relicensing process and recognized in the proposed study plan. CDFG has not described why specifically including this process in the study proposal is necessary and not redundant. YCWA has modified the study proposal to state that YCWA will compile and analyze the available data. YCWA will consult with CDFG and other interested Relicensing Participants and, if it is collaboratively agreed that additional information is needed, YCWA will collaborate with interested Relicensing Participants to develop a new study, will file it with FERC and will perform the study as directed by FERC. YCWA notes USFWS and NMFS did not make a similar request in their comment letters.

3.2.1.16 Study 3.10 – Instream Flow Upstream of Englebright Reservoir *(Request for 11 Modifications)*

The Forest Service, USFWS, NMFS and CDFG requested modifications to YCWA's Instream Flow Upstream of Englebright Reservoir Study (Study 3.10), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 - CDFG requests that the wording "and unimpaired (un-regulated)" be deleted from the last line of Section 3.0 (CDFG, Enclosure A, Redline Study 3.10, p. 2).	**NOT ADOPTED**. CDFG has not described why the inclusion of this analysis would not result in a study sufficient to meet the study information. YCWA believes that developing an understanding of fish habitat that would occur without the Project (i.e., unimpaired flow conditions) is appropriate and does not detract from the study. CDFG and other Relicensing Participants will be free to use the information to the extent they feel appropriate.
2 - CDFG requests the wording "Rainbow trout spawning periodicity will be modified based on fry emergence studies being conducted under Study 3.8, Stream Fish Populations Upstream of Englebright Reservoir" be added as a footnote to Table 5.3.2-1 (CDFG, Enclosure A, Redlined Study 3.10, p. 6).	**ADOPTED**. YCWA has included the requested footnote in the study proposal.
3 – The Forest Service and CDFG requested that tables in Section 5.3.3 – Step 3 refer to the number of transects as minimum number rather than potential or target (Forest Service, Attachment 1, p. 10; CDFG, Enclosure A, Redlined Study 3.10, p. 9).	**ADOPTED WITH MODIFICATION**. YCWA believes the collaborative selection of transects in the field should have some flexibility in the minimum number of transects selected to represent a mesohabitat type. Therefore, YCWA inserted the word "estimated" before the word minimum, as suggested by the Forest Service.
4 – The Forest Service and CDFG requested that the wording "unless they represent a biologically significant unit type," be added to the sentence "Mesohabitat types with a frequency of less than 5% will not be sampled." (Forest Service, Attachment 1, p. 10; CDFG, Enclosure A, Redlined Study 3.10, p. 12).	**ADOPTED**. YCWA has included the requested phrase in the study proposal.

Requested Modifications	YCWA's Reply
6 - The Forest Service and CDFG requested that the wording "During model calibration, the available Relicensing Participants will agree to the limit of model extrapolation during calibration consultation" be added at the end of the paragraph in Section 5.3.7.3 (Forest Service, Attachment 1, p. 11; CDFG, Enclosure A, Redlined Study 3.10, p. 24).	**ADOPTED**. YCWA has included the requested phrase in the study proposal.
7 - The Forest Service and CDFG requested that in the last paragraph of Section 5.3.9, the wording "percentages of maximum WUA (i.e., one percentage value for each day in the period of record)" be deleted and the wording "available habitat values for each day" be inserted in Section 5.3.9 (Forest Service, Attachment 1, p. 12; CDFG, Enclosure A, Redlined Study 3.10, p. 26).	**ADOPTED WITH MODIFICATION**. The wording requested for deletion was left in and the wording requested for insertion was inserted. YCWA believes this change makes this section of the study proposal clearer.
8 - The Forest Service and CDFG requested that the last part of section 5.3.9 beginning with the wording "For the HEA, Licensee will…." and ending with the wording "…to habitat area" be deleted (Forest Service, Attachment 1, p. 12; CDFG, Enclosure A, Redlined Study 3.10, p. 26).	**ADOPTED**. YCWA has deleted the requested section in the study proposal.
9 - The Forest Service and CDFG requested an added bullet and wording changes to two other bullets in Section 5.3.9 (Forest Service, Attachment 1, p. 12; CDFG, Enclosure A, Redlined Study 3.10, p. 26).	**ADOPTED**. YCWA has included the requested bullet and modified wording to two other bullets in this section of the study proposal.
10 - USFWS states that the study "should be conducted using a two-dimensional (2D) model rather than 1D PHABSIM" (USFWS, p.5).	**NOT ADOPTED**. Both 1D and 2D instream flow habitat modeling methods are recognized as valid, and, depending on the site and project specific conditions, are currently used in hydro relicensing in California. In fact, the 1D method was extensively used in the upper Yuba River watersheds as part of the Yuba-Bear and Drum-Spaulding Projects (FERC Project Nos. 2266 and 2310) relicensing. These 1D studies were successfully implemented and are currently the basis for instream flow determinations. USFWS has not adequately explained why the 1D PHABSIM model is insufficient for determining instream flows in the Yuba River Development Project upstream of Englebright Reservoir (Criterion 7).
11 - USFWS requested that "Logistic regression be used to develop habitat suitability criteria" (USFWS, p.5).	**NOT ADOPTED**. YCWA's study proposes the use of existing habitat suitability criteria and does not propose to develop site-specific criteria. Therefore, the use of the logistic regression method is not applicable. USFWS has not adequately explained why existing habitat suitability criteria are insufficient for determining instream flows in the Yuba River Development Project upstream of Englebright Reservoir (Study Criteria 7).

3.2.1.17 Study 3.11 – Fish Entrainment *(Request for 3 Modifications)*

The Forest Service, USFWS and CDFG requested modifications to YCWA's Fish Entrainment Study (Study 3.11), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 - The Forest Service and CDFG requested YCWA include WPT as a species to be monitored in the Fish Entrainment Study (Forest Service, p. 15; CDFG, Enclosure A, Redlined Study 3.17, p. 4).	**NOT ADOPTED.** See YCWA's reply to the Forest Service's and CDFG's request for modifications to the Special-Status Turtles – WPT Study (Study 3.6) in Section 3.2.1.12.
2 - The Forest Service and CDFG requested YCWA modify its study to include DIDSON acoustic camera to be installed at the Narrows 2 Power Intake in Englebright Reservoir to monitor the rate of fish entrainment into the intake (Forest Service, p. 17; CDFG, Enclosure A, Redlined Study 3.17, p. 16).	**NOT ADOPTED**. YCWA finds that the proposal to monitor the rate of fish entrainment into the Narrows Power Tunnel in Englebright Reservoir using DIDSON a camera is not currently warranted and, from a technical standpoint, is not an appropriate methodological application. Prior reservoir studies have found that the density of fish in water approaching 100 feet is very low (NID and PG&E 2009). CDFG correctly identifies that at infrequent low pool reservoir elevations, the Narrows 2 Power Intake can be as shallow as 86 feet, but this is an infrequent occurrence and 86 feet is still a considerable water depth. Therefore, this argument is not compelling enough to justify the suggested study. YCWA suggests that review of the reservoir fish population sampling, which will provide fish presence and relative abundance data near the Englebright reservoir intake at depth will better inform whether the density of fish present warrants an entrainment assessment. Current available knowledge from prior studies suggests that the potential for entrainment is low. From a technical standpoint, the recommended use of a DIDSON acoustic camera is an inefficient application to conduct a long-term entrainment study. The camera provides an image similar to a sonogram in a video format. As a result, a significant amount of data is collected, requiring it to be manually reviewed and for technicians to continually download data. The camera is not generally capable of species identification and the viewing angle of the camera is very narrow. The narrow view of the camera could make it infeasible to monitor the entire intake structure. In addition, the operation of the camera can be unreliable and is not best suited for remote long-term deployments. The best applications for the DIDSON camera are short-term focused behavioral assessments. Other FERC licensing studies that have attempted to deploy the DIDSON camera long-term have documented similar challenges regarding reliability, data management, and species identification that have led to choosing other sampling and monitoring methods (SnoPUD 2011). As such, this method does not represent a generally accepted scientific approach (Criterion 6). The proposed application does not include sufficient details to address these notable technical flaws.
3 - The Forest Service and CDFG request the use of PIT tags to monitor fish entrainment at the diversion tunnels (Forest Service, pp. 17 & 18; CDFG, Enclosure A, Redlined Study 3.17, pp. 16 & 17).	**NOT ADOPTED.** YCWA realizes the technical challenges of conducting an entrainment study at the Project's diversion facilities. YCWA has held onsite meetings at Our House and Log Cabin Diversion where entrainment specialists were invited to review the facilities and discuss options with Relicensing Participants. Several ideas have been provided, but due to technical limitations, none are feasible. The experts specifically stated that the significant range of water elevation change at the intake (up to 15 feet) and the metal grating would interfere with PIT monitoring detectors, reducing detection ranges. PIT monitors can detect tags up to 4 feet in water in optimal environments (i.e., no metal nearby). Antennas can be combined (multiplexed) to achieve greater coverage, but only one antenna can be active at a time. Therefore, there would be significant gaps in the detection area. Scientists generally only multiplex two antennas due to the on/off requirements of the monitoring system and the complexities of maintaining the system. Also maintaining the antennas (i.e., removing debris) during high flows would be problematic, as access to the site is limited during high flow events. These technical details were explained to the Forest Service and CDFG during the field visit. The Forest Service and CDFG have not explained how these technical obstacles would be overcome and the application of the method, therefore, is not reasonable (Criterion 6). YCWA has investigated the potential to conduct a fyke netting survey at the Middle Yuba River Diversion. Results from the preliminary logistical evaluation showed that the netting operation would not operate appropriately, if at all, at high flows (>750 cfs) or low flows (<100 cfs). These operational limitations would limit or preclude monitoring for 25 to 30 percent of the monitoring period, based on historical hydrology. Further, high flow events can mobilize fish species and represent an important monitoring period that may not be feasible to monitor using fyke nets. In addition, safely constructing the trap and implementing the study was estimated to cost approximately $1 million.

Fisheries studies conducted in 2008 and 2009 in the Middle Yuba River proximally above the Project for the Nevada Irrigation District's relicensing (FERC No. 2266) found that the lower section of the Middle Yuba River is a transitional fishery composed of Sacramento sucker (n=193, 75%), rainbow trout (n=58, 22%), and pikeminnow (n=6, 2%) (NID and PG&E 2009). No special status species were collected. The report found that water temperature was a key factor in determining species composition. The data also suggests that the geographic location and natural warming that occurs as water moves into the lower sections of Middle Yuba River may result in a smaller rainbow trout population residing near the YCWA Project.

The existing information suggests that a complex and expensive study is not warranted at the Project diversions. YCWA has proposed a feasible radio monitoring study that would address the behavior of fish near the intakes and their ability to avoid or pass through the diversions. YCWA maintains that the radio study is the best approach.

YCWA requests FERC note that at the August 10, 2011 Relicensing Participants meeting, YCWA, the Forest Service and CDFG agreed to continue discussing technical approaches to entrainment monitoring at the intakes to the Lohman Ridge and Camptonville diversion tunnels. YCWA will keep FERC apprised of these discussions.

3.2.1.18 Study 6.1 – Riparian Habitat Upstream of Englebright Reservoir *(Request for 9 Modifications)*

NMFS and FWN requested modifications to YCWA's Riparian Habitat Upstream of Englebright Reservoir Study (Study 6.1), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – NMFS requested that Study 6.1 quantify the frequency of overbank flows that can facilitate riparian seedling establishment under current and unimpaired conditions (NMFS, Enclosure A, pp. 40 & 41).	**ADOPTED WITH MODIFICATION.** YCWA's study proposal addresses NMFS' request to quantify the frequency of overbank flows. Riparian study sites will be co-located to the extent possible with YCWA's Channel Morphology Upstream of Englebright Reservoir (Study 6.1). Data collected for Study 1.1 will be used in conjunction with data collected for Study 6.1 to quantify the inundation duration and frequency established at transects (Study 6.1, p. 7).
2 – NMFS requested that Study 6.1 assess altered hydrology due to Project operations and its relation to riparian stand condition, structure, and composition (NMFS, Enclosure A, pp. 40 & 41).	**ADOPTED WITH MODIFICATION.** YCWA's study proposal, in part, addresses NMFS' request. Riparian study sites will be co-located to the extent possible with YCWA's Channel Morphology Upstream of Englebright Reservoir (Study 6.1). Data collected for Study 1.1 will be used in conjunction with data collected for Study 6.1 to record hydrology and its relation to riparian stand condition, structure, and composition.
3 – NMFS requested that Study 6.1 assess whether the quantity (both frequency and areal extent) of surfaces available for riparian vegetation establishment has been affected by Project operations that impact the coarse sediment supply (NMFS, Enclosure A, pp. 40 & 41)	**ADOPTED WITH MODIFICATION.** YCWA's study proposal addresses NMFS' request to evaluate the substrate availability for riparian vegetation establishment. Riparian study sites will be co-located to the extent possible with YCWA's Channel Morphology Upstream of Englebright Reservoir (Study 6.1). Data collected for Study 1.1 will record the extent of bedload deposit and will be used in conjunction with data collected for Study 6.1 including channel and bank substrate, evidence of channel encroachment or bank instability, and inundation duration and frequency (Study 6.1, p. 6).
4 – NMFS requested that Study 6.1 describe how riparian vegetation has changed through time (often done through aerial photograph comparisons (NMFS, Enclosure A, pp. 40 & 41).	**ADOPTED.** YCWA's study proposal addresses NMFS' request. Sections 5.3.2 (p.5) and 5.3.3 (p. 7) of the study proposal states YCWA will collect and review aerial photography, where available, for river reaches.
5 – NMFS requested that Study 6.1 evaluate regeneration and germination processes and how they relate to altered Project hydrology. (NMFS, Enclosure A, pp. 40 & 41).	**ADOPTED WITH MODIFICATION.** YCWA has modified the study proposal, to state that size class structure of riparian vegetation will be collected (added to Study 6.1, p. 6).

Requested Modifications	YCWA's Reply
	In requests 1 – 3 and 5, NMFS requests assessment of Project effects. YCWA does not intend to incorporate into the study proposal methods for evaluating Project effects since Relicensing Participants have expressly stated that they view the relicensing studies as data gathering, not an impacts evaluation, and prefer the study reports provide the study data only. Relicensing Participants said they prefer that an assessment of Project effects not be included in the study, but that each Relicensing Participant is free to conduct its own assessment using the data from the study. YCWA has honored that request in its study proposals.
6 – FWN requests that Study 6.1 quantify changes in riparian vegetation patch types, extant, and dominant species between pre-project and post project periods (FWN, pp. 16 & 19).	**ADOPTED.** YCWA's study proposal addresses FWN's request. Sections 5.3.2 (p.5) and 5.3.3 (p. 7) of the study proposal states YCWA will collect and review aerial photography where available for river reaches, and Section 5.3.3 (p. 6) states information will be collected in plots for dominant species coverage in percent.
7 – FWN requests that Study 6.1 evaluate the role of annual life history, hydrology, and channel morphology on the successful recruitment of common riparian woody plants (FWN, pp. 16 & 19).	**ADOPTED.** YCWA's study proposal addresses FWN's request. Riparian study sites will be co-located to the extent possible with YCWA's Study 1.1, Channel Morphology Upstream of Englebright Reservoir (Study 6.1, p. 4). Data collected for Study 1.1 will be used in conjunction with data collected for Study 6.1. Section 5.3.3 of YCWA's study states YCWA will collect: 1) evidence of riparian vegetative connectivity (or lack of; 2) hydrologic connectivity (or lack of); 3) biotic structure, including vertical and horizontal complexity; and 4) add the presences of riparian vegetation to cross-sectional profiles to indicate where the vegetation occurs relative to bankfull and flood prone widths. In addition, YCWA has modified the study proposal, to state size class structure of riparian vegetation will be collected (added to Study 6.1, p. 6).
8 – FWN requests that Study 6.1 investigate the mechanisms that promote/prevent the establishment of common woody plants (FWN, pp. 16 & 19).	**ADOPTED.** YCWA's study proposal addresses FWN's request. Riparian study sites will be co-located to the extent possible with YCWA's Study 1.1, Channel Morphology Upstream of Englebright Reservoir (Study 6.1, p. 4). Data collected for Study 1.1 will be used in conjunction with data collected for Study 6.1. YCWA's Study 6.1, Section 5.3.3 (p. 5) states YCWA will collect quantitative data along vegetation transects. Vegetation transects will extend from the water's edge at low flow, to hill slope or calculated floodprone width. Information collected along each transect will include two types of plots: 1) herbaceous vegetation, and 2) woody vegetation. Quantitative data collected will include information for evidence of channel encroachment or bank stability and evidence of unusual stress or mortality on riparian plant community (p. 5). Section 5.3.3 (p. 7) states YCWA will add the presences of riparian vegetation to cross-sectional profiles to indicate where the vegetation occurs relative to bankfull and flood prone widths. In addition, YCWA has modified the study proposal, to state size class structure of riparian vegetation will be collected (added to Study 6.1, p. 6).
9 – FWN requests that Study 6.1 model riparian woody species response to unimpaired and impaired streamflows (FWN, pp. 16 & 19).	**NOT ADOPTED.** YCWA does not intend to incorporate into the study proposal methods for evaluating Project effects since Relicensing Participants have expressly stated that they view the relicensing studies as data gathering, not an impacts evaluation, and prefer the study reports provide the study data only. Relicensing Participants said they prefer that an assessment of Project effects not be included in the study, but that each Relicensing Participant is free to conduct its own assessment using the data from the study. YCWA has honored that request in its study proposals.

3.2.1.19 Study 6.2 – Riparian Habitat Downstream of Englebright Dam *(Request for 3 Modifications)*

USFWS, NMFS and FWN requested modifications to YCWA's Riparian Habitat Downstream of Englebright Dam Study (Study 6.2), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – USFWS requested deletion of area provided in square feet that describe existing information provide by the National Wetlands Inventory for amount of riparian habitat located in the FERC Project Boundary and Project Area (USFWS, Enclosure 3, Redline Study 6.2, p. 4).	**ADOPTED WITH MODIFICATION.** YCWA modified the study proposal to include a footnote to clarify that NWI data is presented in both square feet and acres to maintain consistency with YCWA's Pre-Application Document (PAD).

Requested Modifications	YCWA's Reply
2 – USFWS requested the replacement of text for a description of Yuba River reach delineation in Study 6.2, Section 5.3.1, Step 1 – Site Selection, with the following text, "The Yuba River has been qualitatively divided into reaches on the basis of "major changes in stream character (gradient, channel morphology and substrate) and significant alteration in stream discharge" (Beak Consultants, Inc 1989)" is requested to be replaced with, "The Yuba River has been qualitatively divided into reaches on the basis of key geomorphic or topologic features, including changes in slope in the longitudinal profile and associated geomorphic variables. Tributary junctions form the upstream boundary of two reaches and dams form the boundary for two more reaches. The other reach boundaries are formed by hydro-geomorphic variables: onset of emergent floodplain gravel; transition from confined bedrock valley to wider, meandering system; and, decreases in bed channel slope. (USFWS, Enclosure 3, Redlined Study 6.2, p. 7).	**ADOPTED WITH MODIFICATION.** YCWA has modified the study proposal in Section 5.3.1, Step 1 – Site Selection, to include USFWS's proposed wording, "The Yuba River has been qualitatively divided into reaches on the basis of key geomorphic or topologic features, including changes in slope in the longitudinal profile and associated geomorphic variables." The geomorphic reach boundaries are defined as, "1) Englebright Dam, 2) the Narrows, 3) Timbuctoo Bend, 4) Parks Bar, 5) Dry Creek 6) Daguerre Point Dam, 7) Hallwood, and 8) Marysville (Wyrick and Pasternack 2011)" (Study 6.2, p. 6). Additional longitudinal boundaries are repetitive and have not been included in Study 6.2.
3 – NMFS requested study sites to be selected within six distinct geomorphic reaches (as identified by RMT to divide the Lower Yuba River downstream of the Narrows into study reaches). NMFS also requested an increase in study sites from four to eight to 10 study sites, with the total number and distribution within each geomorphic reach type selected in collaboration with relicensing participants (NMFS, Enclosure A, pp. 43 & 44).	**ADOPTED WITH MODIFICATION.** Eight distinct geomorphic type reaches were delineated within the Lower Yuba River in accordance with Wyrick and Pasternack (2011), and in collaboration with relicensing participants; Englebright Dam, Narrows, Timbuctoo Bend, Parks Bar, Dry Creek, Daguerre Point Dam, Hallwood, and Marysville. The Narrows and Englebright Dam reaches are not accessible for study and the Marysville Reach will not be studied because the backwater effects of the Feather River confluence may confound Project-related analysis. Five study sites are proposed to represent each of the remaining geomorphic type reaches. The proposed study plan includes a provision for additional sites to be added if necessary to develop a complete characterization of the riparian habitats occurring within the Study Area. NMFS has not shown why extending the study area beyond that proposed in YCWA's study plan is necessary or how the study results would better inform the development of license requirements (Criterion 5).

3.2.1.20 Study 7.1 – ESA-Listed Plants *(Request for 1 Modification)*

USFWS requested modifications to YCWA's ESA-Listed Plants Study (Study 7.1), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – USFWS requested noted that YCWA's study proposal had actions indicated for 2011 that are expected to occur in 2012 (USFWS, p. 6).	**ADOPTED.** YCWA has modified Section 7.0, Schedule, of the study proposal to show the work appropriately occurring in 2012.

3.2.1.21 Study 7.2 – Narrows 2 Powerhouse Intake *(Request for 3 Modifications)*

USFWS and CDFG requested modifications to YCWA's Narrows 2 Powerhouse Intake Study (Study 7.2), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 - USFWS requested that the study include an analysis of the effect of changing the accessibility of the Narrows 2 intake structure for downstream passage of *Oncorhynchus mykiss* (USFWS, p. 6).	**NOT ADOPTED.** The purpose of the study proposal is to assess whether the existing Narrows 2 Intake structure is adequate to meet downstream water temperature targets for anadromous salmonids and, if not, how the structure can be modified to meet those temperature targets. USFWS has not addressed any of FERC's Study Criteria with regards to its request, nor is the request consistent with the purpose of the study. In particular, USFWS has not addressed Study Criterion 5, Project nexus, since steelhead, the anadromous form of *O. mykiss*, does not occur upstream of Englebright Dam.
2 - CDFG requested that Step 1 be modified to state that YCWA would use the relicensing Water Temperature Model to assess whether the existing Narrows 2 intake structure can be used to meet any water temperature objective proposed by Relicensing Participants, besides the water temperature targets developed by the RMT (CDFG, Attachment A, Redlined Study 7.2, p. 6.)	**ADOPTED WITH MODIFICATION.** Step 1 in YCWA's study proposal states that the relicensing Water Temperature Model will be used to assess whether the existing Narrows 2 intake structure can be used to meet the water temperature targets for the Yuba River downstream of Englebright Dam that have been developed collaboratively by NMFS, USFWS, CDFG, PG&E, NGOs and YCWA within the Yuba Accord RMT. CDFG has not addressed Study Criteria 4; that is, why the water temperature targets developed by the RMT, in which CDFG participated, are not adequate for the study assessment. However, YCWA has modified the study proposal to state that the Water Temperature Model would be used to assess targets other than those developed by the RMT if YCWA and Relicensing Participants collaboratively agree to the water temperature targets. Further, YCWA notes that the Water Temperature Model, when developed, will be made available to all Relicensing Participants, who may make any model run they chose.
3 - CDFG requested that Step 1 be modified to state that the study would proceed to Step 2 (Develop Conceptual Designs) unless all Relicensing Participants collaboratively agreed that the existing Narrows 2 intake structure is adequate to meet all operational and temperature management scenarios (CDFG, Attachment A, Redlined Study 7.2, p. 6).	**NOT ADOPTED.** Step 1 in YCWA's study proposal states that Step 2 will not be implemented if it is determined that the existing Narrows 2 intake structure can be used to meet the water temperature targets developed by the RMT. CDFG's requested modification is unreasonable in that no structure can meet all operational and temperature management scenarios. The automatic requirement to develop conceptual designs, a costly exercise, if a potential operational and temperature management scenario is suggested by one Relicensing Participant, which may not be supported by any other Relicensing Participant, is an unreasonable requirement in the study plan. In particular, CDFG has not addressed Study Criterion 7 regarding why YCWA's study proposal is not sufficient to meet the study needs.

3.2.1.22 Study 7.3 – ESA-Listed Amphibians – California Red-Legged Frog (*Request for 3 Modifications)*

USFWS requested modifications to YCWA's ESA-Listed Amphibians – California Red-Legged Frog Study (Study 7.3), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – USFWS requested that the study proposal state that detections of FYLF will be reported to USFWS within 3 working days of the detection (USFWS, p. 6).	**ADOPTED.** YCWA believes that the requested modification is not needed since YCWA's study proposal already states that USFWS will be notified of any CRLF detections within 3 working days of the detection (p. 7), as requested by USFWS.
2 – USFWS requested that the study proposal be modified to state that USFWS will be notified of field assessments at least 30 days in advance of the fieldwork, with the notification including logistics and meeting times and locations. USFWS stated it intended to observe the fieldwork (USFWS, p. 6).	**ADOPTED.** YCWA has modified the study proposal to state that at least 30 days in advance of field assessments, YCWA will provide a notice of fieldwork to USFWS. The notice will include logistics and meeting times and locations for the fieldwork and an invitation for USFWS to observe the fieldwork.
3 – USFWS requested that the study proposal be modified to state that as part of the field assessments, photographs will be taken from opposite directions (e.g., both up and down drainage), if possible (USFWS, p. 6).	**ADOPTED.** YCWA has modified the study proposal to state that as part of the field assessments, photographs will be taken from opposite directions (e.g., both up and down drainage), if possible.

3.2.1.23 Study 7.4 – ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle (*Request for 1 Modification)*

USFWS requested modifications to YCWA's ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle Study (Study 7.4), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – USFWS requested that the study proposal state that detections of VELB exit holes be reported to USFWS within 2 weeks of the detection (USFWS, p. 6).	**ADOPTED.** YCWA has modified the study proposal to state that YCWA will notify USFWS within 2 weeks of detections of VELB exit holes.

3.2.1.24 Study 7.8 – ESA/CESA-Listed Salmonids Downstream of Englebright Dam (*Request for 6 Modifications)*

USFWS and NMFS requested modifications to YCWA's ESA/CESA-Listed Salmonids Downstream of Englebright Dam Study (Study 7.8), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – USFWS noted that the study proposal does not address Project effects on downstream migration of *O. mykiss* attempting to express anadromy (USFWS, p. 6).	**NOT ADOPTED.** USFWS did not request any specific modifications to YCWA's study proposal (i.e., USFWS only made an observation), so YCWA does not have a detailed reply. Also, YCWA found the inference of USFWS's comment confusing. First, if USFWS is implying that Project facilities are barriers to downstream fish movement, the only Project facility in the Yuba River downstream of USACE's Englebright Dam is Narrows 2 Powerhouse. YCWA is not aware of any evidence that would suggest that an *O. mykiss* in the 400-foot section of the Yuba River between Englebright Dam and the powerhouse would not be able to move downstream, should it wish to do so. Second, if USFWS is implying that the Project has created flow or temperature conditions that inhibit the downstream movement of *O. mykiss*, then USFWS should review a document recently prepared by the Yuba Accord RMT, which is comprised of representatives of NMFS, CDFG, DWR, YCWA, PG&E, NGOs and USFWS. In November 2010, the RMT prepared a Technical Memorandum in which they reviewed the appropriateness of the water temperature regime associated with implementation of the Yuba Accord. The RMT also addressed the issue regarding the potential that cold water conditions could affect *O. mykiss* anadromy versus residency. Specifically, the RMT addressed the issue as to whether providing relatively cold water temperatures below Englebright Dam year-round may favor residency over anadromy in lower Yuba River *O. mykiss*, or whether it would be desirable to manage the lower Yuba River water temperature regime to promote anadromy in *O. mykiss*. The RMT Technical Memorandum presented a review of available literature regarding: 1) the proportion of anadromy of the *O. mykiss* population in the lower Yuba River; 2) studies attempting to associate water temperature conditions with anadromy from other river basins (i.e., Yakima, Deschutes, and Willamette river basins in Washington and Oregon); 3) genetically-based adaptive evolution or individual phenotypic plasticity associations of salmonid life histories with environmental characteristics; 4) polymorphic *O. mykiss* population structures and extinction risk; and 5) life history selection strategies in consideration of in- and out-of-basin conditions. In consideration of this suite of considerations, the multi-species/lifestage water temperature suitability evaluations in the Technical Memorandum, and potential adverse impacts on other species and lifestages that could result from the intentional provision of warmer water temperatures, the RMT concluded that providing warmer water temperatures to promote *O. mykiss* anadromy was not recommended.

Requested Modifications	YCWA's Reply
2 – NMFS states that specific objectives in Section 3.0, Study Goals and Objectives, do not explain how Project effects are to be evaluated (NFMS, p. 44 - 45).	**NOT ADOPTED.** NMFS did not request any specific modifications to YCWA's study proposal, so YCWA does not have a detailed reply. For clarification, Section 3.0, Study Goals and Objectives, states both the overall goal of the study and the specific objectives to be evaluated in this study proposal. However, the manner in which potential Project effects on salmonid populations in the Yuba River downstream of Englebright Dam are to be evaluated is provided in Section 5.0, Study Methods and Analysis.
3 – NMFS states that the information presented in Section 2.0, Resource Management Goals of Agencies with Jurisdiction over the Resource to be Studied, simply states which agency has jurisdiction over the resource and does not explain how the study proposal intends to address the resource goals and objectives of NMFS (NMFS, p. 45).	**NOT ADOPTED.** NMFS did not request any specific modifications to YCWA's study proposal, so YCWA does not have a detailed reply. YCWA finds the information presented in Section 2.0 to be consistent with other study proposals and sufficient to explain the relevant resource management goals of the agencies with jurisdiction of the resource.
4 – NMFS states that it is not clear in most cases how the information presented in Section 4.0, Existing Information and Need for Additional Information, will be used to evaluate the effects of the Project. NMFS also states that the study proposal does not explain how existing information will be used to determine Project effects or license conditions, or why new information under development is or is not required (NMFS, p. 46).	**ADOPTED WITH MODIFICATION.** NMFS did not request any specific modifications to YCWA's study proposal. For clarification, Section 5.0, Study Methods and Analysis, describes how the information presented in Section 4.0 will be utilized to evaluate the effects of the Project. As described in response to NMFS's request for a new study, Anadromous Fish Ecosystem Effects: Synthesis of the Direct Indirect and Cumulative Effects of the Project and Related Facilities on Andromous Fish (see Section 3.2.2.7 below), YCWA agrees with NMFS's July 18, 2011 request that the synthesis report prepared under this study proposal (Study 7.8) should incorporate and integrate the results of other relevant studies pertinent to anadromous salmonids in the Yuba River below Englebright Dam proposed in the ILP. Therefore, YCWA has modified the study proposal to specifically include reference to the incorporation and integration of applicable and relevant results emanating from ILP studies conducted downstream of Englebright Dam.
5 – NMFS states that the description of the Project nexus is insufficient and does not explain any nexus between the Project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied. NMFS further states that the study proposal does not acknowledge or discuss the Project's obvious direct effects on stream flows, temperatures, substrate conditions, large instream wood or other abiotic conditions that affect habitat quality and availability for anadromous fishes. NMFS also references its Request #8 regarding a request for a study synthesizing the Project's effects on abiotic elements in terms of their biological effects on anadromous fishes (NMFS, p. 46).	**ADOPTED WITH MODIFICATION.** NMFS did not request any specific modifications to YCWA's study proposal. However, YCWA has revised Section 1.0, Project Nexus, to indicate that the Project has the potential to affect anadromous salmonid habitat quality and availability in the Yuba River downstream of Englebright Dam. YCWA does not intend to incorporate into the study proposal methods for evaluating Project effects since Relicensing Participants have expressly stated that they view the relicensing studies as data gathering, not an impacts evaluation, and prefer the study reports provide the study data only. Relicensing Participants said they prefer that an assessment of Project effects not be included in the study, but that each Relicensing Participant is free to conduct its own assessment using the data from the study. YCWA has honored that request in its study proposals.
6 – NMFS states that the study proposal does not clearly describe what data analysis techniques are to be applied to the existing information listed in Attachment 7.8A (NMFS, p. 47).	**NOT ADOPTED.** NMFS did not request any specific modifications to YCWA's study proposal, so YCWA does not have a detailed reply. For clarification, YCWA reaffirms that the study proposal does describe how a suite of data sources, including but not limited to previously collected data from numerous sources and ongoing monitoring efforts being conducted by CDFG, in association with data previously collected and ongoing data collection efforts by the RMT, will be complied and analyzed as part of a synthesis report conducted under this study proposal.

3.2.1.25 Study 7.9 – North American Green Sturgeon Downstream of Englebright Dam *(Request for 1 Modification)*

USFWS, NMFS and CDFG requested modifications to YCWA's North American Green Sturgeon Downstream of Englebright Dam Study (Study 7.9), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – USFWS, NMFS, and CDFG requested modifications to the study proposal to reflect recent investigations of green sturgeon presence in the Yuba River. NMFS contends that there is ample evidence of Yuba River use by green sturgeon. As a result of this new information, modifications to other study proposal sections (e.g., Study Methods and Analysis) also are requested by the agencies (USFWS, p. 6 – 7 and Enclosure 4, NMFS p. 47 – 48, and CDFG, Attachment A, Redline of Study 7.9).	**ADOPTED WITH MODIFICATION.** YCWA has modified the study proposal to include the recent information regarding green sturgeon observations in the Yuba River. In addition, substantial revisions to the study methods and analysis section have been made as a result of this recent information. Although it is not clear what NMFS means by "ample evidence" of Yuba River use by green sturgeon, YCWA acknowledges the use of the Yuba River downstream of Daguerre Point Dam by green sturgeon. Therefore, YCWA does not agree with the requested revisions from USFWS, NMFS, and CDFG to conduct additional field work to further document the presence of green sturgeon downstream of Daguerre Point Dam. As described in the revised study proposal, YCWA proposes to evaluate the potential effects of Project operations on flows and water temperatures downstream of Daguerre Point Dam, and corresponding potential effects on green sturgeon habitat availability and suitability.

3.2.1.26 Study 7.10 – Instream Flow Downstream of Englebright Dam (*Request for 2 Modifications)*

USFWS and NMFS requested modifications to YCWA's Instream Flow for Steelhead and Chinook Salmon Downstream of Englebright Dam Study (Study 7.10), which is provided in YCWA's Proposed Study Plan. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 - USFWS suggests that YCWA conduct a 2D instream flow study (USFWS, p. 7). 2 - USFWS suggests that YCWA develop site specific habitat suitability criteria (USFWS, pp. 7 & 8).	**ADOPTED:** YCWA's study proposal proposes to use a 2D instream flow method as requested by USFWS. **NOT ADOPTED**. YCWA's study proposes to use existing habitat suitability criteria (HSC). YCWA will hold one or more workshops with interested Relicensing Participants to agree on, among other items: species and life stages; and appropriate HSCs for each target species and life stage. At the current time, YCWA believes the target species will be Chinook salmon and steelhead, and that HSCs currently available (e.g., those recently agreed to for the Tuolumne River) will be used, although existing data being collected by the RMT may help to inform the HSCs. USFWS has not adequately explained why existing HSCs are insufficient for determining flow-habitat relationships in the lower Yuba River, or why YCWA's proposed approach is not sufficient for information needs. Further, YCWA has not justified why the level of effort and cost necessary to develop site-specific HSCs is warranted. (Study Criterion7.)

3.2.1.27 Study 8.1 – Recreation Use and Visitor Surveys *(Request for 21 Modifications)*

The Forest Service and NPS requested modifications to YCWA's Recreation Use and Visitor Surveys Study (Study 8.1), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modification	YCWA's Reply
1 – The Forest Service requested YCWA remove the sentence reading: "In addition, Section 7.8.3 of the Preliminary Information Package describes the recreation opportunities and facilities available in the North and Middle Yuba rivers upstream and downstream of the Project" (Forest Service, Attachment 1, p. 20).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
2 – The Forest Service requested that YCWA confirm the reference to the correct table number (Forest Service, Attachment 1, p. 20).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
3 – The Forest Service requested YCWA include in the study proposal the boating take-out at Indian Valley Campground and survey Canyon Creek Trailhead (along the North Yuba) as the primary access point for hikers/fisherpersons/boaters to the North Yuba River above New Bullard's Bar. (Forest Service, Attachment 1, p. 20)	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
4 – The Forest Service requested YCWA add performance of condition assessments on septic systems (Forest Service, Attachment 1, p. 21).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
5 – The Forest Service requested that Frenchie Point Boat-In Campground be added as a campground facility for New Bullard's Bar Reservoir and add Undeveloped Camping as a facility type and undeveloped shoreline camping areas as facilities (Forest Service, Attachment 1, p. 21).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
6 – The Forest Service requested to correct reference Table 5.3.1.2 Step 1B reference. (USFS Attachment 1, p. 21)	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
7 – The Forest Service requested under section 5.3.1.1.1 Inventory Recreation Facilities, to correct Table Reference 5.3.1-1 (USFS Attachment 1, p. 21).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
8 - NPS requested that "recreation use impact categories and rating system" be better defined, especially the meaning/metrics for the "Moderate" and "High" categories (NPS, Attachment, p. 2).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.

Requested Modification	YCWA's Reply
9 – The Forest Service and NPS requested under 5.3.1.1.2 Facility Condition Assessment, that YCWA add the Forest Service's tool for accessing condition of the facilities and use Good, Maintenance, Repair, and Replace as the categories for assessment (Forest Service, Attachment 1, p. 21; NPS, Attachment, p.2).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
10 – The Forest Service and NPS requested that under Section 5.3.1.1.4, Assessment of Recreation Use Impacts, wording be better defined (Forest Service, Attachment 1, p. 21; NPS Attachment, p. 2).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
11 – The Forest Service requested under Section 5.3.1.2.1, Recreation Facility Access and Circulation Roads, that all roads, regardless of ownership, be inventoried for a consistent access to recreation facilities (Forest Service, Attachment 1, p. 21).	**ADOPTED .** YCWA worked with relicensing participants to address sites included in Table 5.3.1-5: Study sites for the inventory and evaluation of Project recreation facility access and circulation roads. This item was discussed and agreed upon during the July 27, 2011 relicensing meeting.
12 – The Forest Service requested under 5.3.1.2.2, Underground Water Systems, that YCWA evaluate the entire underground Project water system, use the Forest Service's tool to assess condition, and add Marina and Cottage Creek Marina to Table 5.3.1-6 Facility Type (Forest Service, Attachment 1, p. 21)	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
13 – The Forest Service requested under 5.3.1.4, Step 1D – to add that YCWA would inventory and evaluate the dispersed recreation use locations along the New Bullards Bar Reservoir shoreline within the FERC Project Boundary and outside of the Project developed recreation facilities. (Forest Service, Attachment 1, p. 22.)	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
14 – The Forest Service requested YCWA specify that it will conduct a single field survey of the New Bullards Bar Reservoir shoreline by boat to identify locations that show signs of recurrent dispersed shoreline recreation use. (Forest Service, Attachment 1, p. 22.)	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 5, 2011 and agreed to redlined changes in the study proposal.
15 – The Forest Service requested under Table 5.3.2-1 YCWA replace YCWA's table with the Forest Service's table, which notes additional sites (Forest Service, Attachment 1, pp. 22 & 23).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
16 – The Forest Service and NPS requested under 5.3.2.2.1, Types of Visitor Surveys Mail-Back Windshield Visitor Survey, YCWA add specific wording regarding the forms and method of use (Forest Service, Attachment 1, p. 23; NPS Attachment, p. 3).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
17 – The Forest Service and NPS requested under Section 5.3.2.3.1, Target Number of Visitor Surveys, specific wording regarding obtaining target survey number (Forest Service, Attachment 1, pp. 25 & 26; NPS Attachment, p. 3-4)	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.

Requested Modification	YCWA's Reply
18 – The Forest Service and NPS requested YCWA under Section 5.3.2.3.2, Sampling Frequency, add wording regarding peak, shoulder, and low seasons and add additional days within the monthly sampling frequency for the peak season. Suggested a monthly sampling frequency for the shoulder season (for each shoulder season, there are 2).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
19 – The Forest Service and NPS requested under section 5.3.2.3.3 Timing of Sampling, language for timing (Forest Service, Attachment 1, p. 28; NPS Attachment, p. 4-5).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
20 – The Forest Service and NPS requested YCWA under Section 5.3.7.1, Data Analysis, add wording regarding survey responses, QA/QC procedures, and definition of sub-groups (Forest Service, Attachment 1, p. 29; NPS, p. 3).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
21 - NPS requested under Section 5.3.1.1, Assessment of Recreation Use Impacts, that recreation use impact categories and rating system be better defined, especially the meaning/metrics for the "Moderate" and "High" categories (NPS, p.2).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on July 27, 2011 and agreed to redlined changes in the study proposal.
22 - NPS suggested design of the survey in a way that permits the survey staff/interviewers to navigate quickly to relevant sections of the survey. For example, if a line of inquiry is not pertinent to the experience of the person being surveyed they should skip to a more relevant section (NPS, p. 3).	**ADOPTED.** YCWA, the Forest Service and NPS reviewed this request at a meeting on August 2, 2011 and agreed to redlined changes in the study proposal.
23 - NPS suggested separate, more focused survey instruments for contact (on-site interview) and mail-back (self-administered) surveys (NPS, p. 3).	**ADOPTED.** As discussed July 27, 2011 YCWA worked on the survey instrument with relicensing participants to address these issues during a meeting held August 2, 2011.
24 - NPS suggested that the perception of "crowding" element of the survey questionnaire should also address the element of wait times at motorized boat launches (NPS, p.5).	**ADOPTED.** As discussed July 27, 2011 YCWA worked on the survey instrument with relicensing participants to address these issues during a meeting held on August 2, 2011.

3.2.1.28 Study 8.2 – Recreational Flow *(Request for 9 Modifications)*

NPS requested modifications to YCWA's Recreation Flow Study (Study 8.2), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – NPS requested YCWA modify the study proposal to state that other instream recreation needs to be added to whitewater boating and angling and that NPS understands that YCWA agreed to expand the scope of the study plan to include these in the survey and observation efforts (NPS, p. 5).	**ADOPTED.** YCWA and NPS reviewed this request at the August 10, 2011 Relicensing Participants meeting and agreed to redlined changes to YCWA's Recreation Use and Visitor Surveys Study (Study 8.1) would collect the information requested by NPS.
2 - NPS requested YCWA modify the study proposal objectives to include examining the feasibility of providing live flow data via internet for affected reaches, including the main stem below Englebright Reservoir should be added (NPS, p. 5).	**ADOPTED.** YCWA has added the objective to the study proposal, but notes that this is a PM&E measure, not data gathering.
3 - NPS requested YCWA modify the study proposal study area to state that for the purpose of the whitewater boating component of the study, the study area include: 1) North Yuba River, from Indian Valley CG to NBBR; 2) Middle Yuba, Our House Dam to Oregon Creek Day Use Area; 3) Oregon Creek, from Log Cabin Dam to Oregon Creek Day Use Area; 4) Middle Yuba, Oregon Creek Day Use Area to confluence with North Yuba; 5) North Yuba River, from NBBD Dam to confluence with Middle Fork Yuba; 6) North Yuba River from confluence with Middle Yuba to Englebright Reservoir. (NPS, Attachment p. 6).	**ADOPTED WITH MODIFICATION**. After consultation with Relicensing Participants including NPS, YCWA agreed to the following reaches for the purpose of the whitewater boating component of the study: • 7.5-mile-long portion of the Middle Yuba River from Our House Diversion Dam (RM 12.0) downstream to Highway 49 Bridge (RM 4.5) • 12.0-mile-long portion of the Middle Yuba River and main stem Yuba River from Highway 49 Bridge (RM 4.5) downstream to Englebright Reservoir (RM 32.2 on the main stem Yuba River) • 4.1-mile-long portion of Oregon Creek from Log Cabin Diversion Dam (RM 4.1) downstream to the confluence with the Middle Yuba River (RM 0.0) In addition, the North Yuba River whitewater boating reach above New Bullards Bar Reservoir from Indian Valley downstream to New Bullards Bar Reservoir will be included in the study area for the sole purpose of identifying the takeout patterns, issues, and levels of use via a focus group. Note that this reach is not a Project-affected river reach as Licensee does not have any Project control over the flows in this study reach. For the purpose of the angling component of the study, the study area will include: • 2.3 mile-long section of the North Yuba River from New Bullards Bar Dam (RM 2.3) downstream to the confluence with the main stem Yuba River (RM 0.0) • 12.0 mile-long section of the Middle Yuba River from Our House Diversion Dam (RM 12.0) downstream to Highway 49 Bridge (RM 4.5) • 4.5 mile-long section of the Middle Yuba River from Highway 49 Bridge (RM 4.5) downstream to the main stem Yuba River (RM 0.0) • 7.5 mile-long section of the Yuba River (RM 39.6) from the confluence with the North and Middle Yuba rivers downstream to Rice's Crossing (RM 32.2) • 4.1-mile-long section of Oregon Creek from Log Cabin Diversion Dam (RM 4.1) downstream to the confluence with the Middle Yuba River (RM 0.0).
4 - NPS requested that the same river reaches be included in the angling component of the study as in the whitewater boating component of the study. (NPS, p. 6)	**ADOPTED WITH MODIFICATION.** YCWA adopted this recommendation with modification. YCWA proposes to conduct an angling component (focus groups and comparison of regulated/unimpaired opportunity) on each of the following reaches: 1) North Yuba River (NYR) below New Bullards Bar Dam downstream to the confluence with the main stem Yuba River; 2) Middle Yuba River (MYR) below Our House Diversion Dam downstream to Highway 49; 3) MYR below Highway 49 downstream to main stem Yuba River; 4) main stem Yuba River downstream to Rice's Crossing; and 5) Oregon Creek below Log Cabin Diversion Dam (RM 4.1) downstream to the confluence with the MYR (RM 0.0). (Criteria 5 & 6.)
5 - NPS requested YCWA modify the study proposal Angling Component consist of four steps: 1) conducting an angling and resident focus groups; 2) Responses from anglers who participated in the recreation survey; 3) comparing the regulated and unimpaired angling opportunity for the six Study Reaches; and 4) describing the existing angling opportunities on the six Study Reaches. (NPS, p. 5-6)	**ADOPTED WITH MODIFICATION.** YCWA's study plan currently includes the steps proposed with the exception of resident focus groups, which is included in YCWA's Recreation and Visitor Use and Visitor Surveys Study (Study 8.1).

Requested Modification	YCWA's Reply
6 – NPS requested YCWA include anglers and residents in focus groups. (NPS, pp. 5 & 6)	**ADOPTED.** YCWA's study plan currently includes a residents and angler focus group in the Recreation and Visitor Use study (Study 8.1). The study plan will address all types of angling currently taking place within the study reaches.
7 – NPS requested YCWA clarify the term "unimpaired angling." (NPS, pp. 5 & 6)	**ADOPTED WITH MODIFICATION.** YCWA's study proposal addresses this under Section 5.3.2.
8 – NPS requested the focus group process include another step regarding description of existing and desired angling opportunities in certain reaches. (NPS, p. 6)	**ADOPTED.** YCWA currently includes the reaches suggested.
9 – NPS requested YCWA ensure that it reach out to and include as many of the local organizations in the focus groups as possible (NPS, p. 6)	**ADOPTED.** YCWA will reach out to as many angling groups as possible, utilizing the network of Relicensing Participants for recommendations.

3.2.1.29 Study 10.1 – Visual Quality *(Request for 2 Modifications*

NPS requested modifications to YCWA's Visual Quality Study (Study 10.1), which is provided in the folder named "Redlined Study Proposals" at YCWA's Relicensing Website. A summary of each requested modification and YCWA's reply to each request is provided below.

Requested Modifications	YCWA's Reply
1 – NPS requested that the study area not be limited to Project facilities and features from associated viewsheds on public land managed by the Forest Service. (NPS, p. 7).	**ADOPTED WITH MODIFICATION.** YCWA and NPS reviewed this request at the August 10, 2011 and agreed that the redlined changes to YCWA's proposed Visual Quality Study (Study 10.1) would collect the information requested by NPS.
2 – NPS requested the study proposal be modified to state that parties other than the Forest Service would be consulted for visual quality effects of the project. BLM's Visual Resource Management and NPS's Visitor Experience and Resource Protection (VERP) approaches might be applied for other areas affected by the Project downstream of New Bullards Bar Reservoir. Specifically, NPS requested that the following aspects of visual quality be considered throughout the project area: 1) flows over the falls, including dam spillways; 2) in-stream flows for aesthetics (bypassed reaches); 3) screening of structures (vegetation screening; 4) development of view points through maps; 5) wayfinding signage, access points, visitor facilities (bench, bathroom, etc.); and 6) vegetation Buffers. (NPS, p. 7.)	**ADOPTED WITH MODIFICATION.** YCWA and NPS reviewed this request at the August 10, 2011 and agreed that the redlined changes to YCWA's proposed Visual Quality Study (Study 10.1) would collect the information requested by NPS.

3.2.2 Replies to Comment Letters That Requested New Studies

YCWA replies to each of the requested new studies are provided below by study. In general, for each request, YCWA has indicated which Relicensing Participants requested the

modification(s),[19] and YCWA has stated whether YCWA adopted the request without modification, adopted the request with modification, or did not adopt the request. For requests adopted with modifications or not adopted, YCWA has explained the reason why it modified or did not adopt the request, in the context of FERC's seven study criteria.

3.2.2.1 Effects of the Project and Related Activities on Fish Passage for Anadromous Fish (aka NMFS Request #1) (*Request for a New Study*)

NMFS requested a new study named *Effects of the Project and Related Activities on Fish Passage for Anadromous Fish* (NMFS, Enclosure A, pp. 2 through 10). NMFS did not include a detailed study proposal in its comment letter, but referred to the study proposal with the same name that NMFS included in its March 7, 2011 comments on YCWA's PAD. YCWA did not adopt that study.[20]

Based on YCWA's review of NMFS's July 18, 2011 letter, NMFS has not revised any portions of the March 7, 2011 study request. In general, the purpose of NMFS's requested study would be to develop information regarding fish passage conditions and requirements for juvenile and adult life stages of fall-run Chinook salmon, spring-run Chinook salmon, steelhead, North American green sturgeon and Pacific lamprey. The geographic scope of the requested study would be both upstream and downstream of the Lower Yuba River's major dams and reservoirs, which are provided in a list in the study request and include non-Project facilities (e.g., Daguerre Point Dam, Hallwood-Cordua Diversion, South Yuba-Brophy Diversion, Browns Valley Diversions, Narrows Powerhouse and Englebright Dam). NMFS's requested study includes 13 elements:

- Request Element #1 - Information about hydraulic conditions near Project facilities.
- Request Element #2 - Information about fish presence and migration behavior from downstream to upstream of Project facilities. In particular, NMFS requests fish surveys in the Narrows 2 and New Colgate powerhouse areas using DIDSON™ cameras and diving/snorkeling.
- Request Element #3 - Specific fish passage information and a study request regarding Daguerre Point Dam. In particular, this request is for a study of the condition and efficiency of fish ladders and screens at Daguerre Point Dam.
- Request Element #4 - Hydraulic mapping and bathymetric studies at Narrows, Narrows 2 and New Colgate powerhouses and at Englebright, New Bullards Bar, Our House and Log Cabin dams, including an analysis of the need for tailrace barriers at Narrows 2 and New Colgate powerhouses and bypass outfalls.
- Request Element #5 – None listed.

[19] YCWA has not included in the text by study a list of any Relicensing Participants that may have not specifically requested the study but stated support for another Relicensing Participants request. Refer to Table 3.1-1 for that information.

[20] See pages 3-52 through 3-54 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt NMFS's requested study in YCWA's Proposed Study Plan.

- Request Element #6 - "Fill in the gaps" in the existing MWH Fish Passage Study contracted by NMFS and more fully analyze anadromous fish passage options at Englebright Dam and upstream Project facilities.
- Request Element #7 - Study reservoir fish passage conditions upstream of Englebright Dam and each Project dam, including: 1) temperature profiles and conditions near powerhouse intakes; 2) bathymetry profiles in vicinity of Project intakes and New Colgate, Narrows 1 and 2 powerhouses; and 3) hydraulic profiles in similar areas.
- Request Element #8 - Study fish passage at Daguerre, Englebright, and New Bullards Bar Dams, and their tailwater pools, and study general conditions throughout the reservoirs, including collecting temperature profiles, bathymetry profiles and hydraulic profiles.
- Request Element #9 – Assess fish passage conditions in the South Yuba River.
- Request Element #10 – Assess fish passage conditions in the vicinity and upstream of New Colgate powerhouse to New Bullards Bar Dam.
- Request Element #11 – Assess fish passage conditions in the Middle Yuba River.
- Request Element #12 – Assess fish passage conditions in the Upper North Yuba River.
- Request Element #13 – Participate in pilot field experiments for anadromous fish reintroduction, including: 1) adult tracking and migration; 2) smolt outmigration and reservoir transit studies, hydroacoustic mark/re-capture studies; and 3) using fertilized hatchery eggs to establish "founder" populations in upstream reaches.

NMFS estimated the cost to complete this study is between $470,000 and $850,000.

FWN said it supported NMFS's study request, but suggested modifying the study name (i.e., change the words "Anadromous Fish" in NMFS's study title to "*O. mykiss*, ocean type") (FWN, pp 3 – 11).

ADOPTED WITH MODIFICATION. YCWA has not adopted major portions of NMFS's requested study for the reasons described below.

YCWA has adopted some portions of NMFS's requested study in its Revised Study Plan's new study to address the incremental effects of the Project's Narrows 2 Powerhouse on the upstream migration of anadromous fish (Study 3.12).

YCWA notes that it has held several meetings with NMFS's Protected Resources Division and FERC staff regarding the potential content of the applicant-prepared Draft Biological Assessment (BA) and applicant-prepared Draft Essential Fish Habitat (EFH) Assessment that will be included in YCWA's Draft License Application (DLA) and Final License Application (FLA). YCWA agreed during these discussions to include in the applicant-prepared Draft BA a narrative description of conceptual fish passage possibilities at Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam. It was agreed this description will not require any information not already available (i.e., no new studies are needed). A rough

economic analysis, and a schedule for how long it might take to install the facilities if and when it is determined that such measures are required, also will be included in these assessments.

It was also recognized during these discussions that changes in the regulatory climate during the relicensing process (e.g., if NMFS were to reintroduce anadromous fish upstream of Englebright Dam) could trigger the need for additional relicensing studies.

Further, if there ever is anadromous fish passage upstream of Englebright Dam in the future and there is a biological justification for considering adding additional measures to YCWA's FERC license to address this new condition, then NMFS or some other party may ask FERC to order such measures and/or studies to determine the specifics of such measures at such time, and FERC may consider such requests under its standard license reservations of authority.

Portions of NMFS's Request That Pertain to Anadromous Fish Upstream of Englebright Dam

YCWA contends that relicensing studies regarding potential anadromous fish passage at Englebright Dam and Project dams are not needed for two reasons. First, no anadromous fish have occurred upstream of Englebright Dam since 1941, when Englebright Dam was constructed. Therefore, under the existing Project (i.e., the relicensing No-action Alternative and baseline), the Project has no effect on anadromous fish upstream of Englebright Dam because there are no anadromous fish upstream of Englebright Dam now and there never have been any such fish upstream of Englebright Dam since before the YRDP Project was constructed.

The second reason is that it is unlikely any anadromous fish will be present upstream of Englebright Dam in the reasonably foreseeable future. This is because there are no proceedings in progress that are reasonably likely to result in anadromous fish being introduced into the Yuba River or its tributaries upstream of Englebright Dam by any future date certain.

In their comments on the PAD and Proposed Study Plan, NMFS, USFWS and FWN indicate that they disagree with this second reason. In its Proposed Study Plan, YCWA stated that it believed those commenters individually or collectively had put forth four arguments to suggest that anadromous fish would occur in the reasonably foreseeable future upstream of Englebright Dam. YCWA addressed each of those arguments in the Proposed Study Plan (pp. 3-2 through 3-8), and YCWA further addresses them and the NMFS and FWN rebuttals to YCWA's comments in its Proposed Study Plan below.

<u>Argument #1</u>
NMFS and others have argued that FERC, as part of the relicensing process, will include Englebright Dam in the Yuba River Development Project FERC license, and that FERC will direct YCWA to implement fish passage at the dam, which will result in anadromous fish occurring upstream of Englebright Dam in the reasonably foreseeable future. However, NMFS and others have provided no evidence demonstrating that FERC will include Englebright Dam in YCWA's FERC-licensed Project. Regardless of their arguments on why they believe FERC

should include Englebright Dam in YCWA's FERC-licensed Project, FERC does not have jurisdiction to include a federal facility like Englebright Dam within a FERC license.[21]

Argument #2
NMFS and others also have argued that it is reasonably foreseeable that anadromous fish will be introduced into the Yuba River or its tributaries upstream of Englebright Dam in the near future because they believe that FERC will order YCWA to provide fish passage past Englebright Dam as part of the relicensing process, because the Project's Narrows 2 Powerhouse, either by itself or in combination with PG&E's Narrows Powerhouse and/or Englebright Dam, blocks upstream fish passage. While NMFS concedes that Englebright Dam is a "physical barrier to fish passage," NMFS nevertheless argues that YCWA's Narrows 2 Powerhouse and PG&E's Narrows Powerhouse are "hydraulic and mechanical barriers to fish passage." NMFS further argues that "the trio of the dam and its two associated hydropower facilities altogether are responsible for blocking fish passage" (NMFS July 18, 2011 letter, Encl. A, pp. 2-3, underline in original).

NMFS's attempt to lump the Narrows 2 Powerhouse with Englebright Dam, and thereby to make YCWA responsible for studies regarding fish passage at Englebright Dam, should be rejected. NMFS cannot escape the fundamental facts that anadromous fish passage was completely blocked when the California Debris Commission constructed Englebright Dam in 1941, and that YCWA's construction of the Narrows 2 Powerhouse 25 years later did not change this condition. Even if the Project's Narrows 2 Powerhouse now blocks the upstream passage of anadromous fish in the Yuba River past the location of the Narrows 2 Powerhouse's outlet (a question that will be investigated in Proposed Study 7.11, which is discussed below), elimination of this condition would only allow the fish to migrate upstream an additional 400 feet, where Englebright Dam still would completely block the further upstream passage of such fish. The only difference would be that fish would be able to move upstream to the toe of Englebright Dam. However, there is little or no spawning habitat available in the 400 feet between the Narrows 2 Powerhouse outlet and the toe of Englebright Dam, so any biological impact of the Narrows 2 Powerhouse on such passage is negligible.

Even though the impacts of the Narrows 2 Powerhouse on anadromous fish passage are either non-existent or negligible, YCWA has developed and included in its Revised Study Plan a proposed new study (Study 7.11), which will study the incremental effects of the Narrows 2 Powerhouse on the upstream migration of anadromous fish. This study will provide information necessary for the development of license conditions regarding mitigating any Narrows 2 Powerhouse incremental effects on the upstream migration of anadromous fish.

Argument #3
The third argument is that, even if FERC does not make Englebright Dam part of YCWA's FERC-licensed Project, FERC nevertheless will direct YCWA to implement fish passage at the dam, which will result in anadromous fish occurring upstream of Englebright Dam in the reasonably foreseeable future. However, the commenters have provided no evidence that FERC

[21] See YCWA response to comments on SD 1, dated April 12, 2011, pages 9 and 10.

is planning to direct YCWA to include, as part of relicensing, any actions for fish passage at Englebright Dam. YCWA has stated the many reasons why fish passage at Englebright Dam should not be addressed as a direct or indirect Project effect in the relicensing process. Some of these reasons are:

- USACE's Englebright Dam was constructed in 1941, almost 20 years before the formation of YCWA and more than 25 years before construction of the Yuba River Development Project.
- USACE's Englebright Dam was built by the California Debris Commission. YCWA had not been formed at that time, and Yuba County did not contribute to or participate in the construction of Englebright Dam.
- Since its construction in 1941, Englebright Dam has completely blocked anadromous fish passage to upstream habitat. The dam does not now have, and never has had, any low-level outlets or fish ladders that would permit volitional upstream fish passage, nor has the USACE ever had in place a program, such as capture and haul, to pass anadromous fish upstream of Englebright Dam in a non-volitional manner.
- Englebright Dam is not, and never has been, a part of YCWA's Yuba River Development Project.
- YCWA does not own, operate or maintain any portion of Englebright Dam or Reservoir. This authority resides exclusively with the USACE by act of the United States Congress.[22]
- None of the Yuba River Development Project facilities are integral parts of Englebright Dam. YCWA's Narrows 2 Power Conduit and Narrows 2 Powerhouse, the lowermost YRDP Project facilities, are not connected or attached to Englebright Dam in any way, nor do they intersect (e.g., pass through) the dam in any way (the Narrows 2 Power Tunnel goes through the hillside, not through Englebright Dam).

At pages 4 through 7 of Enclosure A to its July 18, 2011 letter, NMFS states that YCWA in its Proposed Study Plan failed to note that the Project has affected Englebright Dam because some water now flows through the Narrows 2 Powerhouse while previously this water all either flowed through the Narrows 1 Powerhouse or spilled over the dam, and NMFS argues that this change has had consequences regarding downstream and upstream anadromous fish passage. YCWA apologizes for not pointing out this change in its Proposed Study Plan. However, this change has not had any effect on downstream passage of anadromous fish because no such fish occur upstream of Englebright Dam. Regarding the effects on the Narrows 2 Powerhouse on upstream passage, YCWA has developed and included in its Revised Study Plan a new study (Study 7.11), which will address the incremental effects of the Narrows 2 Powerhouse on upstream migration of anadromous fish.

FWN, in its July 17, 2011 letter, argues that the Yuba River now flows through the Narrows 2 Powerhouse and, that because there are no fish passage facilities within the powerhouse, the powerhouse blocks upstream fish movement (FWN, p. 6). YCWA's proposed new study (Study

[22] River and Harbor Act of 30 August 1935 (P. L. 409, 74th Congress, 1st Session, 49 Stat. p. 1028-1049), and Public Law 716, 75th Congress, 3rd Session, approved 25 June 1938.

7.11) will address the incremental effects of the Narrows 2 Powerhouse on upstream migration of anadromous fish in the Yuba River between the Narrows 2 Powerhouse outlet and the toe of Englebright Dam. Because, as discussed above, the Narrows 2 Powerhouse did not change the fact that Englebright Dam already completely blocked the upstream passage of anadromous fish, YCWA disagrees with FWN's argument that the Narrows 2 Powerhouse blocks further upstream movement of these fish.

FWN also argues that the SWRCB, in its Revised Water Rights Decision 1644 (RD-1644), concluded that "YCWA is responsible for Englebright's blockage of fish passage" (FWN letter, p. 9). FWN quotes the part of RD-1644 that discussed the public trust doctrine and concluded that, because the Project obtains some benefits from the existence of Englebright Dam, the SWRCB could order YCWA to maintain certain minimum instream flows in the lower Yuba River for fisheries purposes (See RD-1644, pp. 30-34). However, contrary to FWN's argument, RD-1644 did not hold that the Project caused any blockage of upstream fish passage, and the fact that the SWRCB relied on the benefits that Englebright Dam provides to the Project to order YCWA to maintain certain minimum instream flows in the lower Yuba River does not support FWN's argument that FERC should order YCWA to conduct studies regarding fish passage at Englebright Dam. Moreover, the instream-flow requirements in RD-1644 were superseded by the new streamflow requirements in the Lower Yuba River Accord, so this part of RD-1644 no longer has any legal effect.

Argument #4

The fourth argument is that, even if FERC does not make Englebright Dam a part of the Project or direct that YCWA to provide for fish passage at the dam, another party will provide for fish passage at the dam, which will result, in the reasonably foreseeable future, in anadromous fish occurring upstream of Englebright Dam, and that FERC therefore should require YCWA to study fish passage conditions.

This argument was made, but not supported, during FERC's February 2, 2011, NEPA scoping meeting in Marysville, California. When asked by FERC staff about when NMFS expected anadromous fish to be introduced upstream of Englebright Dam, NMFS representatives described various discussions regarding potential introduction, but could not provide any schedule for such introduction. In fact, NMFS staff stated, as recorded at page 44, lines 23 through 25 of the meeting transcript:

> the [NMFS] Service has not pre-decided the reintroduction of anadromous fish into the waters above Englebright

which indicates that the introduction of anadromous fish above Englebright Dam is not a reasonably foreseeable future action.

Public Review Draft Recovery Plan for Sacramento River Winter-Run Chinook Salmon, Central Valley Spring-Run Chinook Salmon and Central Valley Steelhead

Nor is this argument supported by NMFS's proceeding for its Public Review Draft Recovery Plan for Sacramento River Winter-Run Chinook Salmon, Central Valley Spring-Run Chinook Salmon and Central Valley Steelhead (Draft Plan). When directly questioned regarding the timing for finalization of this Draft Plan by FERC staff at the public meeting, NMFS representatives would not speculate or give a date when the Draft Plan would become final.

Further, even if the Draft Plan is finalized without alteration, it will not provide concrete measures for introduction of anadromous fish above Englebright Dam. Instead, it only will call for further work at some future time to "*Develop and implement a phased approach to salmon reintroduction planning to recolonize historic habitats above Englebright Dam*."[23] This uncertainty is confirmed by the following statements in the Draft Plan:

> The spring-run Chinook salmon/steelhead conceptual recovery scenario also includes reintroduction of spring-run Chinook salmon/steelhead to the candidate areas of the North Fork, Middle Fork and South Fork Yuba rivers. Reintroduction of anadromous salmonids above Englebright Dam has been the subject of recent and current investigations. Evaluation of habitat suitability for anadromous salmonids upstream of Englebright Dam was recently undertaken (DWR 2007), but those evaluations have yet to be finalized as part of the Upper Yuba River Watershed Studies Program. Currently, NMFS is evaluating the feasibility of providing passage for anadromous salmonids at Englebright Dam. Hence, the conceptual recovery scenario does not further discuss specific restoration actions associated with reintroduction.[24]

The Draft Plan also contains the following disclaimer:

> Recovery plans do not necessarily represent the views, official positions or approval of any individuals or agencies involved in the plan formation, other than NMFS. They represent the official position of NMFS only after they have been signed by the Assistant Administrator. Recovery plans are guidance documents only; identification of an action to be implemented by any public or private party does not create a legal obligation beyond existing legal requirements…Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery actions.[25]

[23] National Marine Fisheries Service. 2009. Public Draft Recovery Plan for Sacramento River Winter-Run Chinook Salmon, Central Valley Spring-Run Chinook Salmon and Central Valley Steelhead. Sacramento Protected Resources Division. October 2009. Page 161.
[24] *Ibid.* Page 115, 140.
[25] *Ibid*. Page 2.

In the Draft Recovery Plan, NMFS describes the timeframe and cost estimates for its proposed recovery action (See Draft Recovery Plan, Section 1.9.6.1: Develop and implement a salmon reintroduction plan to re-colonize historic habitats above Englebright Dam in Table 8-2, Implementation table for priority 1 recovery actions). The Draft Plan proposes to begin evaluations in year 1, with pilot testing in years 2 through 5,[26] and to begin a long-term passage program in year 10, although the table is unclear whether the listed years will begin after the Final Plan is formally adopted or after finalization of a subsequent specific salmon reintroduction plan. The minimum cost for the feasibility study and other associated recovery actions is estimated by NMFS to be $50 million, and the Draft Plan does not describe a funding source for this money. Instead, the Draft Recovery Plan, at page 67, states:

> Recovery plans are not regulatory documents and successful implementation and recovery of listed species will require the support, efforts and resources of many entities, from Federal and state agencies to individual members of the public. Another goal will be to encourage and support effective partnerships with regional stakeholders to meet the objectives and criteria of the Recovery Plan.

In light of these uncertainties, the Draft Plan does not support the argument that there will be fish passage at Englebright Dam by any date certain.

NMFS's 2007 Biological Opinion for the USACE's Operation of Englebright Dam

In its July 18, 2011 letter, NMFS noted that the federal District Court has remanded NMFS's 2007 Biological Opinion (BO) for the USACE's operation of Englebright Dam to NMFS, and that NMFS is preparing a new BO for these operations. NMFS states that it cannot provide details of decisions regarding the new BO that have not yet been made, but that it would be unreasonable to ignore this legal proceeding, and that it indicates that there is a reasonably foreseeable possibility that passage could occur as a result of USACE's new ESA consultation with NMFS (NMFS, Encl. A, pp. 3 & 4). YCWA also cannot provide details of decisions yet to be made in this new consultation. Until USACE's new Biological Assessment (BA) for the referenced consultation and NMFS's new BO are prepared and available for review, it would not be reasonable for FERC to assume that this new consultation will result in upstream anadromous salmonid passage at Englebright Dam in the reasonably foreseeable future, as NMFS suggests.

Yuba Salmon Forum and North Yuba Reintroduction Initiative

In its July 18, 2011 letter, NMFS states that "*developments in the Yuba Salmon Forum, in which the Applicant has been actively participating, wherein multiple stakeholder parties are investigating potential alternatives for reintroduction of salmonids into the upper Yuba*

[26] At page 13 of Enclosure F of NMFS's March 7, 2011 letter, NMFS stated that it has filed a preliminary ESA § 10(a)(1)(a) permit for field pilot experiment studies using adult and juvenile Chinook salmon and steelhead for research purposes, and lists the types of pilot programs envisioned. NMFS requests that, as a part of a new study (Effects of the Project and related Activities on Fish Passage for Anadromous Fish), FERC direct YCWA to "conduct these experiments" under the oversight of NMFS. In subsequent discussions with NMFS, YCWA was advised that NMFS has not filed such a permit application.

watershed," constitute evidence that anadromous fish will be present upstream of Englebright Dam in the reasonably foreseeable future (NMFS, Encl. A, pp. 9 & 10). However, for the reasons discussed in the following paragraphs, the existence of the Yuba Salmon Forum process (and the North Yuba Reintroduction Initiative, which also is discussed below) does not support NMFS's argument that FERC should order YCWA to conduct fish passage studies as part of the relicensing process.

YCWA has asserted, and continues to assert, that Project facilities do not block anadromous fish passage, and, in its comments on the Draft Plan, YCWA provided information supporting that position (Proposed Study Plan at pp. 3-4 through 3-8). However, YCWA recognizes that the recovery of anadromous fish is an important directive of the ESA and that the Yuba River could play a significant role in recovery efforts. In a complex watershed such as the Yuba River, where four FERC licensees operate facilities and hold various consumptive and non-consumptive water rights, USACE facilities physically block passage, and numerous other stakeholders, including the Forest Service, BLM, several counties and numerous private landholders, have significant interests, efforts to promote recovery of anadromous salmonids will indeed require the support, efforts and resources of many entities, as suggested in the NMFS's Draft Recovery Plan.

YCWA is working with a diverse group of stakeholders including NMFS, FERC licensees, CDFG, USFWS, USACE, Forest Service, and numerous NGO's interested in reintroduction of salmonids throughout the Yuba River watershed, in the Yuba Salmon Forum. The purpose of the Yuba Salmon Forum is to identify, evaluate, recommend, and seek to achieve implementation of effective near-term and long-term actions to achieve viable salmonid populations in the Yuba River watershed to contribute to recovery goals, while also considering other beneficial uses of water resources and habitat values in neighboring watersheds, as part of Central Valley salmonid recovery actions.

A smaller stakeholder group, which includes YCWA, NMFS, USACE, CDFG, American Rivers and Trout Unlimited is currently exploring whether to pursue a focused consideration of reintroduction of salmonids on the North Yuba River above New Bullards Bar Reservoir. These participants expect that this process, known as the North Yuba Reintroduction Initiative, would advance recovery of salmonid fisheries on the Yuba River consistent with the Draft Recovery Plan and in a manner that would reflect the participants' respective interests. The participants intend that this process would be complementary to the Yuba Salmon Forum process.

Outcomes for the Yuba Salmon Forum and North Yuba Reintroduction Initiative are not yet developed, and could include a wide spectrum of alternatives ranging from more focused restoration actions solely on the lower Yuba River, which currently supports populations of spring-run and fall run Chinook salmon and steehead and is relatively secure from the impacts of climate change because of upstream reservoirs, through various passage or reintroduction alternatives to mid- or upper regions of the watershed. Numerous challenges (e.g., genetic impacts, costs, climate change impacts, water supply impacts and expected return success) need to be evaluated prior to selecting a preferred concept. Alternatives would need to be further scrutinized through NEPA and/or CEQA processes, and various permits and authorities secured.

At this juncture, it would appear that introduction of anadromous fish to the upper Yuba River watershed upstream of USACE's Englebright Dam is possible, but hardly imminent or certain. It also is clear that responsibilities for the current situation and abilities to contribute to potential solutions must be shared among many parties, and should not be imposed on one upstream licensee. The existences of Yuba Salmon Forum and the North Yuba Reintroduction Initiative, therefore, do not support NMFS's argument that FERC should order YCWA to conduct fish passage studies.

NMFS's Independent Actions

In its July 18, 2011 letter, NMFS also states that it is undertaking certain independent investigations and is developing an anadromous fish introduction plan that should be available in early 2012 (NMFS, p. 10). However, NMFS has not provided any details regarding the likelihood that this plan will result in the introduction of anadromous fish into the Yuba River or any of its tributaries upstream of Englebright Dam, or any schedule for such introduction. This proposed plan therefore does not support NMFS's argument that FERC should order YCWA to conduct studies regarding fish passage

Elements 9, 11 and 12 of NMFS's study request would require YCWA to assess passage conditions in the North Yuba, Middle Yuba and South Yuba rivers for anadromous fish. Also, Element 6 of this request would require YCWA "fill in the gaps" in a prior MWH study contracted by NMFS, and Element 13 would require YCWA participate in pilot field experiments for anadromous fish reintroduction. YCWA believes that these are inappropriate study requests. While they might provide some information regarding NMFS's assessments for its Draft Recovery Plan, that draft plan is separate from this relicensing, and these study elements would not provide information relevant to this relicensing.

Portions of NMFS's Request That Pertain to Non-Project Facilities

NMFS's study request also asks FERC to order YCWA to study fish passage conditions at dams and diversions (including Daguerre Point Dam and the Hallwood-Cordua and South Yuba-Brophy diversions) and powerhouses (including PG&E's Narrows Powerhouse) that are not Project facilities and that are located downstream of all Project facilities (NMFS July 18, 2011 letter, Encl. A, pp. 7-9). YCWA believes NMFS has not provided any evidence concerning Project nexus for these elements of its study request, other than to note that the facilities are downstream of the Project, and the issue here is whether existing information is adequate to address the incremental effects of the Project, in combination with these non-Project facilities, on anadromous fish. YCWA believes that existing information is adequate for this cumulative analysis, and that the detailed site information requested by NMFS (e.g., bathymetric surveys, hydraulic modeling, fish behavior, efficiency of existing fish screens, design of new fish screens and ladders) is not needed.

In its July 18, 2011 letter, NMFS stated it included the non-Project facilities in its requested study because information on these facilities could be useful in determining Project effects on downstream fish screens and ladders (NMFS, p. 8). YCWA believes existing information is

adequate to assess these effects, and that it should not be a licensee's responsibility to gather information so that NMFS can assess the effectiveness of non-Project fish screens and ladders.

Portions of NMFS's Request That Pertain to Project Facilities Downstream of Englebright Dam

YCWA has developed and included in its Revised Study Plan a proposed new study (Study 7.11, Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration), which will study the incremental effects of the Narrows 2 Powerhouse on the upstream migration of anadromous fish. This study will provide information necessary for the development of license conditions regarding mitigating any Narrows 2 Powerhouse incremental effects on the upstream migration of anadromous fish, and address many of the elements in NMFS's requested study.

3.2.2.2 Effects of the Project and Related Activities on Hydrology for Anadromous Fish (aka NMFS Request #2) (*Request for a New Study*)

NMFS requested a new study named *Effects of the Project and Related Activities on Hydrology for Anadromous Fish* (NMFS, Enclosure A, pp. 10 through 16). NMFS did not include a detailed study proposal in its comment letter, but referred to the study proposal with the same name that NMFS included in its March 7, 2011 comments on YCWA's PAD. YCWA did not adopt that study in its Proposed Study Plan.[27]

Based on YCWA's review of NMFS's July 18, 2011 letter, NMFS has not revised any portions of the March 7, 2011 study but NMFS has added a new element (i.e., #8). In general, the purpose of NMFS's requested study would be to inform NMFS in its ESA § 7 consultation and decisions regarding potential fishway alternatives and designs and for the purpose of safe and effective fish passage. The geographic scope of the study is not stated specifically, but appears to be the entire Yuba River watershed. NMFS's March 7, 2011 request included seven "elements" and an eighth element has been added since then. Each of the elements are addressed below. NMFS estimated the cost to complete this study, without Element 8, is between $100,000 and $250,000. NMFS did not estimate the cost for Element 8. FWN stated that it supported NMFS's study request (FWN, pp. 11 & 12).

YCWA has not adopted the portions of the requested new study that pertain to anadromous fish passage at Englebright Dam or anadromous fish upstream of Englebright Dam for the reasons described in Section 3.2.2.1.

The portions of the requested new study that do not pertain to anadromous fish passage at Englebright Dam and anadromous fish upstream of Englebright Dam and YCWA's reply to each request are provided below.

[27] See pages 3-54 through 3-56 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt NMFS's requested study in YCWA's Proposed Study Plan.

Requested Modifications	YCWA's Reply
Request Element #1 – Develop three hydrologic data sets: 1) unimpaired using an independent analysis and not using information from the NID's Yuba-Bear Hydroelectric Project and PG&E's Drum-Spaulding Project relicensing hydrology, 2) Yuba River Development Project operations with unimpaired inflows to the Project; and 3) current conditions. The datasets would include data for each of the three scenarios for points in the Yuba River watershed, in the Feather River above and below the confluence with the Yuba River and in the Sacramento River to the Sacramento-San Joaquin Delta.	**NOT ADOPTED.** NMFS has not changed its fundamental request for this element. The response given in YCWA's response to comments of the Proposed Study Plan is still valid. Two of the hydrology data sets of NMFS request are identical to the hydrology data sets already included in the Hydrology Report and data provided in the PAD. These data sets are the Unimpaired and Current conditions hydrology, with the exception that the unimpaired hydrology includes data received from the Yuba-Bear/Drum Spaulding relicensing. NMFS provides no information to suggest that the information from the Yuba-Bear/Drum-Spaulding relicensing is incorrect and therefore should not be used (Criteria 4 and 7). The third requested hydrology data set, Project operations with unimpaired inflows to the Project, is not hydrology but is a modeling study. This data set could only be developed as the results of a modeling scenario using unimpaired hydrology as inputs to the Water Balance/Operations Model, and is therefore not a new study but a requested model run scenario for Study 2.2 Water Balance/Operations Model. YCWA will consider all reasonable model run requests once the Water Balance/Operations Model is developed, and outside of that study. NMFS in its comment letter of July 18, 2011 continues to assert that the third data set is not a model run. However, NMFS ignores the fact that to obtain hydrologic information which includes flow at various nodes below the Project, without the effects of the upper watershed projects, a model run must be made that uses unimpaired flows as the inflow to the Project facilities. NMFS goes on to make comments on the approach for the proposed Hydrologic Alterations Study (Study 2.1). These comments suggest that the new data set is needed for this study. The information needed for the Hydrologic Alterations Study is the third data set proposed in the Water Balance/Operations Model Study (Study 2.2), which is the hydrology absent the Project, which will be compared with the simulated hydrology below Project facilities with historical inflow. With regard to the development of hydrology below the mouth of the Yuba River in the Feather River and in the Sacramento River to the Bay-Delta, NMFS has not identified in its comments how examination of these other rivers would inform the development of potential license requirements, as required in FERC's study Criterion 5. Instead, NMFS in its comments specifically addresses the applicability of Criterion 5 with regard to fish passage at fishways and not on these resources. In addition, for Project hydrology effects on anadromous fish below Englebright Dam, NMFS does not provide any statements or information that suggests the current studies are inadequate to provide information on any Project effects on these fish at this location as required by FERC study Criterion 7. Within the context of a cumulative effects examination, existing information available at the locations downstream of the Yuba River will be used to characterize the Project effects cumulatively with other effects. No additional hydrologic data is needed for this analysis. Note that YCWA's proposed Water Temperature Monitoring Study (Study 2.5) includes data collection in the Feather River upstream and downstream of the confluence with the Yuba River.
Request Element #2 – Develop a flood frequency analysis on the three data sets listed in NMFS's Request Element 1, and summarizing average monthly flows and pulse flows.	**NOT ADOPTED.** As previously stated in YCWA's Proposed Study Plan response to NMFS comments, flood frequency analysis, which is an analysis of the annual peak flows at specified locations below the Project and ramping rate analysis on resulting flow and stage are already part of YCWA's Hydrologic Alternation Study (Study 2.1). NMFS has not provided any information that this study is inadequate to produce sufficient information to characterize flood frequency or ramping rates (Criteria 4 and 7). With regard to NMFS July 18, 2011 comments on this element regarding "effects on salmonid attraction and immigration" this would be a fisheries resources study for the lower Yuba River, and the hydrology data sets and Water Balance/Operations Modeling Study (Study 2.2) will inform the fisheries studies. NMFS has not stated why this information is not adequate (criterion 7).
Request Element #3 – Compute the timing, magnitude, duration, and volume of spills at Project dams, and Englebright Dam.	**NOT ADOPTED.** The characterization of ramping rates of change of flow below the various Project facilities is already part of YCWA's Hydrologic Alterations Study (Study 2.1). The request for a 2D model for the reach of the Yuba River below New Colgate Powerhouse is stated by NMFS to be needed for analysis of effects on anadromous fish passage, and the reasons for not adopting this request are described in Section 3.2.2.1.

Requested Modifications	YCWA's Reply
Request Element #4 – Analyze data for changes of flow and stage below the New Colgate and Narrows 2 powerhouses as well as below Log Cabin Diversion Dam and Our House Diversion Dam, and document the 10 largest ramp-up and ramp-down events. Under this item, NMFS also requests that a two-dimensional (2-D) hydraulic model of the reach below the New Colgate Powerhouse to Englebright Reservoir be developed and the ramp-up and ramp-down events modeled for effects on anadromous fish passage barriers and fish passage facility operations.	**NOT ADOPTED.** This element is not adopted for the same reasons that Request Element #3 is not adopted.
Request Element #5 – Develop a 2-D hydraulic model for the Yuba River below Narrows 2 Powerhouse to the Feather River to assess floodplain inundation frequency and magnitude under current and unimpaired conditions.	**ADOPTED WITH MODIFICATION.** YCWA has adopted with modification NMFS's request for YCWA to perform a 2D habitat model. The model will not be developed to the Feather River since backwater conditions make modeling that section of river problematic. The model will be able to assess various flow conditions. The adequacy of this study and response to NMFS for this element is addressed in YCWA's response to comments for Instream Flow Downstream of Englebright Dam Study (Study 7.10) in Section 3.2.1.26.
Request Element #6 – Determine the location and configuration of partial or full natural barriers to anadromous salmonid migration, and analysis of hydrology at these locations to determine under what conditions and what times these barriers are passable to fish, if at all.	**NOT ADOPTED.** Request Element #6 applies to the river upstream of Englebright Dam. The reasons for not adopting the request are provided in Section 3.2.2.1.
Request Element #7 – Analyze and synthesize available information regarding Project's effects on the Bay-Delta ecosystem and consumptive water demands in the Bay-Delta.	**NOT ADOPTED.** As stated in its letter of July 18, 2011, NMFS agrees that this is not a study, but a request for information for the PAD. NMFS goes on to correctly state that FERC in SD2 recommends a geographic scope that includes the Bay-Delta for cumulative effects. A cumulative effects analysis would use readily available information on this geographic region, along with information on Project effects. This is what is planned for the cumulative effects analysis for the various resources. Therefore, NMFS has not stated why this study plan is insufficient (Criterion 7).
Request Element #8 – Quantify Project effects on seven hydrograph components: fall baseflows, fall floods, winter baseflows, winter floods, snowmelt floods, snowmelt recession and summer baseflows. Detailed hydrologic data would be developed for unimpaired flow conditions, existing conditions and operations of the Project only (i.e., no other water projects in the watershed).	**ADOPTED WITH MODIFICATIONS.** The Hydrologic Alteration Study (Study 2.1) has been revised to include some of the requested information. Items not included but requested by NMFS are the Project only hydrology data set, for reasons explained in Request Element 1 response above, and the average rate of change of flow during the snowmelt recession, because NMFS does not provide sufficient detail about this information to determine what is being requested (Criterion 6).

3.2.2.3 Effects of the Project and Related Activities on Water Temperature for Anadromous Fish Migration, Holding, Spawning and Rearing Needs (aka NMFS Request #3) (*Request for a New Study*)

NMFS requested a new study named *Effects of the Project and Related Activities on Water Temperature for Anadromous Fish Migration, Holding, Spawning and Rearing Needs* (NMFS, Enclosure A, pp. 16 & 17). NMFS did not include a detailed study proposal in its comment

letter, but referred to the study proposal with the same name that NMFS included in its March 7, 2011 comments on YCWA's PAD. YCWA did not adopt that study in its Proposed Study Plan.[28]

Based on YCWA's review of NMFS's July 18, 2011 letter, NMFS has not revised any portions of the March 7, 2011 study. In general, the purpose of NMFS's requested study would be to inform ESA § 7 consultation between NMFS and FERC. The geographic scope of the study is not stated specifically, but appears to be the entire Yuba River watershed, and especially the North Yuba River from its headwaters. NMFS's March 7, 2011 request included three "elements," each of which is discussed below. NMFS estimated the cost to complete this study is between $100,000 and $250,000.

FWN stated that it supported NMFS's study request (FWN, p. 12).

YCWA has not adopted the portions of the requested new study that pertain to anadromous fish passage at Englebright Dam or anadromous fish upstream of Englebright Dam for the reasons described in Section 3.2.2.1.

The portions of the requested new study that do not pertain to anadromous fish passage at Englebright Dam and anadromous fish upstream of Englebright Dam and YCWA's reply to each request are provided below.

Requested Modifications	**YCWA's Reply**
Request Element #1 – Monitor temperatures at several stream locations through 2012. NMFS noted the locations being monitored by YCWA as part of its Water Temperature Monitoring Study and requested the addition of a location on Oregon Creek upstream of Log Cabin Diversion dam and locations on the North Yuba River upstream of New Bullards Bar Reservoir. The element also includes collecting water temperature profiles in New Bullards Bar Reservoir at three locations bi-monthly through 2012.	**NOT ADOPTED.** NMFS's requested water temperature monitoring does not include any monitoring locations that are not already included in YCWA's proposed Water Temperature Monitoring Study (Study 2.5).
Request Element #2 – Investigate water temperature refugia, including in tributary inputs, hyporheic flows and stratified pools.	**NOT ADOPTED.** Request Element #2 applies to the river upstream of Englebright Dam. The reasons for not adopting the request are provided in Section 3.2.2.1.
Request Element #3 – Develop a tool comprised of one or more models to predict water temperatures in Project-affected stream and reservoirs. The tool should model the entire Yuba River basin as well as the Feather River to the Sacramento River under different watershed development and climatic scenarios.	**NOT ADOPTED.** NMFS's request includes many criteria that are included in YCWA's proposed Water Temperature Modeling Study (Study 2.6). However, NMFS does not describe why YCWA's proposed study is not adequate to provide sufficient information (Criterion 7). NMFS states that "*Without modeling the longitudinal temperature profile throughout the reservoir is not possible to evaluate the Project's effects on resident fish as well as develop the necessary information for potential fish passage alternatives that include New Bullards Reservoir"*. NMFS does not state why a one dimensional model will not properly characterize the longitudinal temperature regime of the reservoir. Also NMFS July 18, 2011 letter correctly states that Study Plan 2.6 "may only model Englebright Reservoir in only one dimension," however the study proposal states this reservoir may be modeled using a 2-D approach. In addition, the Water Temperature Monitoring Study (Study 2.5) includes two temperature profile locations to inform the selection of a suitable modeling approach for this reservoir.

[28] See pages 3-56 through 3-57 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt NMFS's requested study in YCWA's Proposed Study Plan.

With regards to climate change, the Project does not affect climate change. Also, to perform the assessment of this effect that has been requested, one first would have to have an accurate prediction of climate change in the Yuba River watershed over the term of the new license. YCWA believes that such a prediction is not available at this time or in the reasonably foreseeable future. This same issue was addressed in FERC's September 2008 SD2 for the Yuba-Bear Hydroelectric Project, Drum-Spaulding Project and Rollins Transmission Line Project relicensings. In that document, FERC stated: *"While we recognize that global and regional climate change has potential for changes to the water supply, hydroelectric generation, and the environment, we are concerned that reliable models for predicting climate over the term of the new license at a project-specific level do not exist."* YCWA believes this conclusion has not changed. For these reasons, YCWA believes the effect is outside the scope of relicensing.

NMFS's estimated cost for all of the requested elements is from $100,000 to $250,000. YCWA estimates the total costs would be two to three times NMFS estimate, and NMFS's request, if adopted, would not substantially increase the amount or detail of information over what the current study plan will provide.

3.2.2.4 Effects of the Project and Related Activities on Coarse Substrate for Anadromous Fish: Sediment Supply, Transport and Storage (aka NMFS Request #4) (*Request for a New Study*)

NMFS requested a new study named *Effects of the Project and Related Activities on Coarse Substrate for Anadromous Fish: Sediment Supply, Transport and Storage* (NMFS, Enclosure A, p. 17). NMFS did not include a detailed study proposal in its comment letter, but referred to the study proposal with the same name that NMFS included in its March 7, 2011 comments on YCWA's PAD. YCWA did not adopt that study in its Proposed Study Plan.[29]

NMFS notes that YCWA's proposed Channel Morphology studies (Studies 1.1 and 1.2) are similar to NMFS's request and progress is being made on those studies. However, NMFS still requested its new study. Based on YCWA's review of NMFS's July 18, 2011 letter, NMFS has not revised any portions of the March 7, 2011 study. In general, NMFS study would evaluate the effects of the Project on fluvial processes and channel morphology, which includes the amount and size of coarse substrate material that life stages of anadromous and resident fishes use and rely upon in freshwaters. The study area includes: 1) the Middle Yuba River from Our House Diversion Dam to the confluence with the North Yuba River; 2) Oregon Creek from the Log Cabin Diversion Dam to the confluence with the Middle Yuba River; 3) the North Yuba River from New Bullards Bar Dam to the confluence with the Middle Yuba River; 4) the portion of the Yuba River from the confluence of the North and Middle Yuba rivers downstream to Englebright Dam; 5) the lower Yuba river from Englebright Dam to the Feather River confluence; and 6) the portion of the North Yuba, Middle Yuba, and Oregon Creek affected by base-level control exerted by either the diversion dams (Our House, Log Cabin) or reservoir water level (New Bullards Bar). NMFS's new study request includes six requested "elements," which are discussed below. NMFS estimated the cost to complete this study is between $125,000 and $225,000.

[29] See pages 3-57 through 3-59 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt NMFS's requested study in YCWA's Proposed Study Plan.

Requested Modifications	YCWA's Reply
Request Element #1 - Develop sediment supply estimates to Project-affected reaches through reservoir sediment rates into Project and nearby reservoirs and extrapolation of sediment yields to Project-affected reaches.	**NOT ADOPTED.** Section 5.4.2.9 of YCWA's Channel Morphology Upstream of Englebright Reservoir Study (Study1.1) states that sediment supply estimates of sediment yield will be based on regional studies, including those based on data from Englebright Reservoir. An estimated sediment yield average of 250 tonnes/km^2/year with bedload estimated to be 15 percent of the total sediment yield was agreed to by Relicensing Participants at a meeting on June 3, 2011 as a reasonable estimate. NMFS has not shown why this estimate, in which a representative from NMFS participated, does not meet the stated information need (Criterion 7). Sediment supply estimates are accommodated in YCWA's proposed Channel Morphology Downstream of Englebright Reservoir Study (Study 1.2), which addresses the requested elements of NMFS study plan for the area between Englebright Reservoir and the Feather River. NMFS has not shown why that study does not meet the stated information need (Criterion 7).
Request Element #2 - Coarse level stratification and study site selection through reviewing existing information and historical aerial photography, establishing map-based channel slopes and longitudinal profiles, identifying response reaches, and selecting study sites.	**NOT ADOPTED.** Coarse level stratification was done using habitat mapping data and evaluation of access, gradient, and reviewing the aerial video. Study sites have been considered at 10 locations based on this information and have been set out in Table 5.3-1 of YCWA's proposed Channel Morphology Upstream of Englebright Reservoir Study (Study 1.1). NMFS has not shown why the study site selection protocol is insufficient to meet the stated information needs (Criterion 7). Reaches have been identified and study areas have been selected and other elements of the request are accommodated in YCWA's proposed Channel Morphology Downstream of Englebright Reservoir Study (Study 1.2), which addresses the requested elements of NMFS study plan for the area between Englebright Reservoir and the Feather River. NMFS has not shown why that study does not meet the stated information need (Criterion 7).
Request Element #3 - Assess channel morphology and fluvial processes by mapping sediment facies, collecting bulk samples of alluvial sediment, measuring cross sections, establishing stage-discharge relationship, measuring longitudinal profile, mapping coarse sediment storage, and noting other channel characteristics.	**NOT ADOPTED.** In YCWA's Channel Morphology Upstream of Englebright Reservoir Study (Study 1.1), all of the requested elements have been covered in Section 5.3.2, Step 2, Data Collection. Sediment facies (Section 5.3.2.4), bulk samples (Section 5.3.2.4), cross sections (Section 5.3.2.1), stage-discharge relationship (Section 5.3.2.2), longitudinal profile (Section 5.3.2.3), coarse sediment mapping (Section 5.4.2.9), and the collection of parameters for other channel characteristics are described. Data collection included a site map described in Section 5.3.2.5 that includes major features; Section 5.3.2.6 describes the assessment of streambank erosion potential, and Section 5.3.2.7 describes the assessment of channel stability. Also included is an assessment of bedload input from tributaries, the deposits due to backwater effects from Log Cabin and Our House Diversions and from the mean high water level of New Bullards Bar into Slate Creek, and an examination of the effects of uncontrolled spill over Project dams and the New Colgate Powerhouse Tailrace. NMFS is unspecific as to what other channel characteristics are at issue but has also not shown why the existing study plan does not meet the stated information needs (Criteria 7). Extensive channel morphology studies are on-going and elements of the request are accommodated in YCWA's proposed Channel Morphology Downstream of Englebright Reservoir Study (Study 1.2), which addresses the requested elements of NMFS study plan for the area between Englebright Reservoir and the Feather River. NMFS has not shown why that study does not meet the stated information need (Criterion 7).
Request Element #4 - Calculate bed mobility and sediment transport capacity by a tracer rock study, calibrating a hydraulic model, calculating grain shear stress, establishing incipient motion, calculating frequency of bedload mobilization, and calculating transport capacity.	**NOT ADOPTED.** Section 5.3.3 in YCWA's Channel Morphology Upstream of Englebright Reservoir Study (Study 1.1), sets out sediment mobility assessment methods, and includes a sediment transport model that estimates sediment transport capacity. An incipient motion analysis of particular grain sizes will be used to hypothesize "meaningful discharge", or discharges at which the bed is mobilizing grains of interest. NMFS agreed to the use of the model and the methods of analysis in the June 3, 2011, meeting, and has not shown why the existing study plan does not meet the requested information needs (Criterion 7). Bed mobility and transport capacity study elements are accommodated in YCWA's proposed Channel Morphology Downstream of Englebright Reservoir Study (Study 1.2), which addresses the requested elements of NMFS study plan for the area between Englebright Reservoir and the Feather River. NMFS has not shown why that study does not meet the stated information need (Criterion 7).

Requested Modifications	YCWA's Reply
Request Element #5 - Evaluate coarse sediment storage in Project-affected reaches and compare to reference reaches.	**NOT ADOPTED.** Coarse sediment storage is being assessed in Project reaches as stated in Section 5.4.2.9 of YCWA's Channel Morphology Upstream of Englebright Reservoir Study (Study 1.1), It is relevant to assess current conditions in the reaches but comparing to a reference reach will not be done as the objective of the study is to evaluate the continued operation of the Project and referring to a hypothetical reference reach is unwarranted and would not inform the development of license requirements (Criterion 5). Coarse sediment storage is being assessed and study elements are accommodated in YCWA's proposed Channel Morphology Downstream of Englebright Reservoir Study (Study 1.2), which addresses the requested elements of NMFS study plan for the area between Englebright Reservoir and the Feather River. NMFS has not shown why that study does not meet the stated information need (Criterion 7).
Request Element #6 - Synthesize results to evaluate ecological and geomorphic impacts by a sediment budget, summary and tabulation of results, develop bedload and sediment transport rating curve, and develop a simple conceptual model of channel sediment dynamics under current and reference conditions.	**NOT ADOPTED.** Results will be synthesized, summarized, tabulated, etc., sufficient to present the results of the study that will evaluate effects of the continued operation of the Project on geomorphic processes. A sediment budget and channel sediment dynamics under reference conditions will not be done as the objective of the study is to evaluate the continued operation of the project and referring to a hypothetical reference reach or a sediment budget prior to the establishment of the project is unwarranted and would not inform the development of license requirements (Criteria 5). Study elements are accommodated in YCWA's proposed Channel Morphology Downstream of Englebright Reservoir Study (Study 1.2), which addresses the requested elements of NMFS study plan for the area between Englebright Reservoir and the Feather River. NMFS has not shown why that study does not meet the stated information need (Criterion 7).

3.2.2.5 Effects of the Project and Related Activities on Large Wood and Riparian Habitat for Anadromous Fish (aka NMFS Request #5) (*Request for a New Study*)

NMFS requested a new study named *Effects of the Project and Related Activities on Large Wood and Riparian Habitat for Anadromous Fish* (NMFS, Enclosure A, pp. 17 through 20). NMFS did not include a detailed study proposal in its comment letter, but referred to the study proposal with the same name that NMFS included in its March 7, 2011 comments on YCWA's PAD. YCWA did not adopt that study in its Proposed Study Plan.[30]

Based on YCWA's review of NMFS's July 18, 2011 letter, NMFS has not revised any portions of the March 7, 2011 study. In general, according to NMFS, the three Project dams (New Bullards Bar, Our House Diversion, and Log Cabin Diversion) along with Englebright Dam trap large woody material[31] (LWM), which is periodically removed from the reservoirs by YCWA and not returned to the river ecosystem. These actions have reduced LWM supplied to reaches downstream of Project dams, which could have negative effects on downstream habitat for anadromous fish. The magnitude of Project effects on LWM is a function of the amount of LWM trapped in project reservoirs, the potential mobility of that wood, and the distribution of potential depositional zones downstream. Information regarding the historical LWM budget along with the LWM volumes removed by the Applicant will help inform potential protection, mitigation and

[30] See pages 3-59 through 3-62 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt NMFS's requested study in YCWA's Proposed Study Plan.

[31] Large woody material (LWM) will replace large woody debris (LWD) for current and future relicensing purposes but may be used interchangeably with previously filed documents.

enhancement measures. NMFS's study has four "Request Elements," each of which is discussed below. NMFS estimated the cost to complete this study is between $50,000 and $100,000.

FWN said it supported NMFS's study request (FWN, p. 13).

YCWA has not adopted the portions of the requested new study that pertain to anadromous fish passage at Englebright Dam or anadromous fish upstream of Englebright Dam for the reasons described in Section 3.1.2.

The portions of the requested new study that do not pertain to anadromous fish passage at Englebright Dam and anadromous fish upstream of Englebright Dam and YCWA's reply to each request are provided below.

Requested Modifications	**YCWA's Reply**
Request Element #1 - Quantitative and anecdotal information on LWM removal from Project reservoirs and diversions including New Bullards Bar and Englebright reservoirs, and Our House and Log Cabin Dams, will be assembled. Potential impacts of other land use activities, such as timber harvest, salvage logging, road construction, and channel modification that can alter LWM loading should also be assessed. From this information, estimates of annual volumetric flux of wood volume entering project reservoirs and diversions will be calculated.	**ADOPTED WITH MODIFICATION**. Quantitative and anecdotal information will be gathered and summarized as described in Section 5.3.3 in Study 6.1 Riparian Habitat Upstream of Engelbright. This information will be compiled from YCWA records regarding quantity and fate of woody material removed from New Bullards Bar Reservoir, from Our House Dam, and from Log Cabin Dam. Quantitative and anecdotal information of debris removal and fate from Englebright Lake will also be requested from USACE and summarized. Because antidotal information will be used, no specific metrics are predetermined in Study 6.1. Annual estimates of the volume of LWM trapped in reservoirs may be included in reporting efforts if available information is adequate to do so. With respect to Criterion 5, project nexus and how the information would inform license requirements, the potential impacts of other land use activities, such as timber harvest, salvage logging, road construction, and channel modification are not Project activities and therefore does not appropriately explain the nexus between Project operations and effects on the resources to be studied or how the study results would inform the development of license requirements.
Request Element #2 - LWM survey during the geomorphic field surveys conducted for NMFS study request #4 perform survey of LWM in 4 size classes. Various additional measurements may be needed of "key" pieces of LWM depending on size of the LWM in comparison to the channel bankfull width. Control reaches upstream of significant watershed development should be surveyed for LWM using the protocols above and used in comparative analysis. Control reaches outside of the Yuba basin can be chosen but must be representative of the climate, hydrology and geomorphology and geology of the study reaches and adequate justification provided.	**ADOPTED WITH MODIFICATION.** LWM survey during the riparian habitat field surveys at two study sites upstream and two sites downstream of Englebright Dam will be conducted in 4 size classes, as described in Section 5.3.3 of Study 6.1 Riparian Habitat Upstream of Englebright and Section 5.3.3.3.4 of Study 6.2 Riparian Habitat Downstream of Englebright. Licensee will randomly select the four study sites to include the LWM survey. In addition, Section 5.3.3 of YCWA's proposed Riparian Habitat Upstream of Englebright (Study 6.1) will include a LWM assessment for a distance of at least 20 times the bankfull width to be done on a section of Oregon Creek above Log Cabin Dam and these values will be compared to the LWM assessment within Oregon Creek.

Requested Modifications	YCWA's Reply
Request Element #3 - Evaluation of Project effects on LWM and LWM Budget to evaluate and summarize Project and other land-use effects on LWM dynamics in the Project area, which extends from the upstream extent of project reservoirs. Evaluation of Project effects on LWM should include the development of a LWM budget that extends from the upstream extent of Project Reservoirs past Englebright Dam to the confluence with the Feather River. Conceptually, a wood budget uses a mass balance approach to analyze the input, output, depletion, and changes in storage of LWM in a channel network using a simplified mass balance relationship for LWM for a given channel segment.	**ADOPTED WITH MODIFICATION.** LWM has been quantified during habitat mapping in Project reaches above Englebright. There will be additional quantification according to the methods described in Section 5.3.3 of Study 6.1 Riparian Habitat Upstream of Englebright. Additionally, anecdotal information concerning wood removal records at Our House and New Bullards Bar Dams will be included. Upstream of Log Cabin Dam, the proposed study will include a LWM assessment of a distance of at least 20 times the bankfull width will be performed. Information regarding woody material in the Lower Yuba River will be obtained from the RMT and included in Study 6.2 Riparian Habitat Downstream of Englebright, as described in Section 5.3.3.3.4. The Project nexus (Criterion 5) is the volume of wood trapped in Project-facilities that is no longer available to downstream reaches, and the estimate of LWM in Project-affected reaches compared to regional estimates of LWM loading in similar sized Sierra streams. Existing conditions will be assessed and Project influences on LWM loading will be discussed. LWM loading prior to the dams being in place are not relevant as those conditions cannot be quantified and the *effects of continued operations given the existing LWM availability and fate* [emphasis added] are the object of the study. YCWA does not intend to incorporate into the study proposal methods for evaluating Project effects on LWM since Relicensing Participants have expressly stated that they view the relicensing studies as data gathering, not an impacts evaluation, and prefer that the study reports provide the study data only. Relicensing Participants said they prefer that an assessment of Project effects not be included in the study, but that each Relicensing Participant is free to conduct its own assessment using the data from the study. YCWA has honored that request in its study proposals.
Request Element #4 - Evaluate the Project's effects on riparian habitat and vegetation by assessing composition and distribution, and by quantifying the amount and type of riparian habitat lost under Project Reservoirs, including: New Bullards Bar, Our House, and Log Cabin reservoirs. The most appropriate method will likely be extrapolating riparian composition, distributions, and frequency from control reaches with similar geomorphic characteristics as the channels now under the reservoirs along the length of the now submerged channels. Reference reaches may also be used.	**ADOPTED WITH MODIFICATION.** The contribution of LWM will be included in the study of riparian distribution, composition and health; information including LWM elements will be utilized in the assessment, as described in Section 5.3.3 in Study 6.1 Riparian Habitat Upstream of Englebright and in Section 5.3.3.3.4 of Study 6.2 Riparian Habitat Downstream of Englebright. YCWA does not intend to incorporate into the study proposal methods for evaluating Project effects on LWM since Relicensing Participants have expressly stated that they view the relicensing studies as data gathering, not an impacts evaluation, and prefer that the study reports provide the study data only. Relicensing Participants said they prefer that an assessment of Project effects not be included in the study, but that each Relicensing Participant is free to conduct its own assessment using the data from the study. YCWA has honored that request in its study proposals.

3.2.2.6 Effects of the Project and Related Activities on Loss of Marine-Derived Nutrients in the Yuba River (aka NMFS Request #6) (*Request for a New Study*)

NMFS requested a new study named *Effects of the Project and Related Activities on Loss of Marine-Derived Nutrients in the Yuba River* (NMFS, Enclosure A, pp. 20 through 22). NMFS did not include a detailed study proposal in its comment letter, but referred to the study proposal with the same name that NMFS included in its March 7, 2011 comments on YCWA's PAD. YCWA did not adopt that study in its Proposed Study Plan.[32]

Based on YCWA's review of NMFS's July 18, 2011 letter, NMFS has not revised any portions of the March 7, 2011 study. In general, the goal of this study is to evaluate the effects of the Project and Project-related activities on the degree of reduction or loss in nutrient replenishment

[32] See pages 3-62 through 3-63 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt NMFS's requested study in YCWA's Proposed Study Plan.

to the upper and lower Yuba River. The nutrients in question are those that are marine-derived (i.e., nitrogen, carbon, and phosphorus), and then transported and deposited in freshwaters by migrating anadromous fishes. For simplicity, only the mass of nitrogen (N) will be measured. In the final element, NMFS requests information about current uptake of marine-derived N, which can be "traced" in terrestrial systems because the proportion of the heavier isotope is greater in marine than freshwater ecosystems. NMFS requests YCWA examine the ratio of (heavy) marine-derived N isotopes to the (lighter) atmospheric isotopes in periphyton and benthic macroinvertebrates collected in upper and lower Yuba locations, to compare and determine if differences in uptake in nutrients has occurred since salmon have lost access to the upper Yuba. NMFS's new study request includes seven request "elements," each of which is discussed below. NMFS estimated the cost to complete this study is between approximately $10,000 and $20,000.

YCWA has not adopted the portions of the requested new study that pertain to anadromous fish passage at Englebright Dam or anadromous fish upstream of Englebright Dam for the reasons described in Section 3.1.2.

The portions of the requested new study that do not pertain to anadromous fish passage at Englebright Dam and anadromous fish upstream of Englebright Dam and YCWA's reply to each request are provided below.

Requested Modifications	**YCWA's Reply**
Request Element #1 - To estimate a range of the historic mass of marine-derived N that was transported annually by Chinook salmon (all runs) to the Yuba River. This is baseline information and may be obtained from a proportional estimate of the Yuba Run based on estimates by Merz and Moyle (2006) for the Central Valley. NMFS requests the Applicant use a 10- kilogram (kg) average mass for adult Chinook, and a 5.62 percent average N content.	**NOT ADOPTED**. NMFS's requested for historical information (e.g., 1850's anecdotal information) YCWA provide a "baseline" regarding the historic levels of the numbers of annually returning Chinook salmon and corresponding amounts of marine-derived nitrogen transported annually to the Yuba River is not required by FERC for assessing environmental impacts under NEPA or CEQA. As explained in the preamble to its relicensing regulations, FERC does not require relicense applicants to gather information or conduct studies regarding the condition of resources in the project area that existed prior to the initial licensing and construction of the project (Interagency Task Force Report on NEPA Procedures in FERC Hydroelectric Licensing, May 22, 2000). The requested historical information also would not provide quantitative data suitable for assessment with current estimates of marine-derived nitrogen transported by Chinook salmon to the Yuba River.
Request Element #2 - An estimate of the historic mass of marine-derived N that was transported annually by spring-run Chinook salmon to the upper Yuba River. This is baseline information done similarly as in step 1 if possible.	**NOT ADOPTED**. The reasons for not adopting the request are provided in Section 3.2.2.1.
Request Element #3 - An estimate of the current annual mass of marine-derived N transported by Chinook salmon to the lower Yuba River. This is current information, for comparison with baseline and should use the recent peak and 10-year (2001-2010) average Yuba River Chinook escapements, a 10 kilogram (kg) average mass for adult Chinook, and a 5.62% average N content to compute an estimated range of the current mass of marine-derived N transported annually to the Yuba River using the above equation.	**NOT ADOPTED**. In its March 7, 2011 comments on the PAD, NMFS described that the major nexus to the Project was that "its facilities and operations may act to both reduce the abundance of returning Chinook salmon and/or impede or block their passage to upstream habitats." Although NMFS contends that the Project facilities or operations (i.e., flows and water temperatures) may result in "reduced abundance" of Chinook salmon, NMFS does not provide any information in either the March 7, 2011 comments on the PAD or the July 18, 2011 comments on the Proposed Study Plan supporting this contention. In fact, operations of the Project have resulted in the provision of flows and particularly of water temperatures that improved the habitat suitability for anadromous salmonids that existed prior to construction and operation of the Project. Given this, NMFS has not adequately described the need for the information.

Requested Modifications	YCWA's Reply
Request Element #4 - An estimate of the current annual mass of marine-derived N transported by phenotypic "spring-run" Chinook salmon to the Yuba River. This is current information, for comparison with baseline and would be derived from Vaki Riverwatcher counts at Daguerre Point Dam, otoliths, and possible tagging of some spring-run Chinook to validate the analysis.	**NOT ADOPTED**. YCWA has not adopted this request for the same reasons it did not adopt the Request Element #3.
Request Element #5 - An estimate of the annual loss, from historic to current levels, of marine-derived N to the Yuba. This compares historic (baseline) conditions with current conditions from estimates obtained previously.	**NOT ADOPTED**. YCWA has not adopted this request for the same reasons it did not adopt the Request Element #2 and #3.
Request Element #6 - An estimate of the annual loss, from historic to current levels, of marine-derived N to the upper Yuba. This compares historic (baseline) conditions with current conditions from estimates obtained previously.	**NOT ADOPTED**. YCWA has not adopted this request for the same reasons it did not adopt the Request Element #2 and #3.
Request Element #7 - Compare differences of marine-derived N incorporated into periphyton and aquatic benthic macroinvertebrates in upper and lower Yuba. Determine if uptake is occurring, and to what degree in the upper and lower Yuba.	**NOT ADOPTED**. YCWA has not adopted this request for the same reasons it did not adopt the Request Element #2 and #3.

As described above, YCWA and NMFS's Protected Resources Division have consulted regarding the potential content of the applicant-prepared BA and applicant-prepared Draft EFH Assessments that will be included in YCWA's DLA and FLA. YCWA agreed during these discussions to include in the applicant-prepared Draft BA a statement that if anadromous fish were established upstream of Englebright Dam in significant numbers, nutrient concentrations might be higher, which might lead to more macroinvertebrates, which in turn might lead to larger fish.

Additionally, the July 18, 2011 comment letter references a meeting between YCWA and NMFS, at which NMFS states "the Applicant appeared to object to the lower Yuba River evaluation on the basis of the lack of Project nexus." This statement is unsupported in NMFS's comment letter, and NMFS does not disagree or raise an argument with regards to the lack of a nexus to the lower Yuba River.

3.2.2.7 Anadromous Fish Ecosystem Effects: Synthesis of the Direct Indirect and Cumulative Effects of the Project and Related Facilities on Anadromous Fish (aka NMFS Request #8) (*Request for a New Study*)[33]

NMFS requested a new study named *Anadromous Fish Ecosystem Effects: Synthesis of the Direct Indirect and Cumulative Effects of the Project and Related Facilities on Anadromous Fish* (NMFS, Enclosure A, pp. 22 through 30). NMFS did not include a detailed study proposal in its comment letter, but referred to the study proposal with the same name that NMFS included in its March 7, 2011 comments on YCWA's PAD. YCWA did not adopt that study in its Proposed Study Plan.[34]

Based on YCWA's review of NMFS's July 18, 2011 letter, NMFS has not revised any portions of the March 7, 2011 study, but added a new element (i.e., #8). In general, the goal of the study is to "*synthesize the various abiotic and biotic categories studied in the ILP process (i.e., water resources, geology and soils, etc.) into a holistic and comprehensive assessment of the direct, indirect and cumulative effects of the Project, along with the effects of other activities that are interrelated or interdependent with the Project action, on anadromous fishes and their habitats."* The study would consider the combined effects on each life stage of a species as well as on population structure and composition. The proposed study is arranged into six sub-elements that correspond to the life history stages of the species, and one population dynamics modeling element. NMFS indicates that the specific quantitative information needed for development of the population dynamics model should be gathered as parts of the six lifestage-specific elements. NMFS's previous study request included seven elements and an eighth element has been added:

- Request Element #1 - This element is primarily focused on the adult migration lifestage of spring-run Chinook salmon. However, NMFS indicates that it would also address fall/late-fall Chinook salmon and steelhead. The primary migration-specific information requested by NMFS as part of this element pertaining to the Yuba River downstream of Englebright Dam includes assessments of the temporal distribution of upstream migration, potential relationships with flows and water temperatures (including attraction flows and temperatures), passage considerations at Daguerre Point Dam and other potential physical fluvial/geomorphologic influences on adult upstream migration.
- Request Element #2 - This element is focused on the adult holding lifestage of spring-run Chinook salmon and steelhead. The primary holding-specific information requested by NMFS as part of this element pertaining to the Yuba River downstream of Englebright Dam includes assessments of holding habitat availability and characterization, potential relationships between holding habitat availability and suitability and flows and water temperatures, and other potential physical fluvial/geomorphologic influences on holding habitat.

[33] NMFS's comment letter does not include a NMFS Request #7. In NMFS's March 7, 2011 letter, NMFS Request #7 was a requested study named *Effects of the Project and Related Activities on Aquatic Benthic Macroinvertebrates for Anadromous Fish*. The study request was not resubmitted or otherwise addressed in NMFS's July 18, 2011 letter.

[34] See pages 3-64 through 3-69 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt NMFS's requested study in YCWA's Proposed Study Plan.

- Request Element #3 - This element is focused on the adult spawning lifestage of spring-run and fall/late-fall Chinook salmon and steelhead. The primary spawning-specific information requested by NMFS as part of this element pertaining to the Yuba River downstream of Englebright Dam includes assessments of spawning habitat characterization, utilization, temporal and spatial distributions, substrate suitability and fluvial/geomorphologic influences on spawning habitat, and potential relationships between spawning habitat availability and suitability and flows and water temperatures.
- Request Element #4 - This element is focused on the embryo incubation/emergence lifestage, although it does not specify species or runs to be addressed. This request element focuses on the influence of substrate size, composition, and other fluvial/geomorphologic influences, and potential relationships between flow and water temperatures (including the temporal and spatial distributions of water temperature suitability, and potential redd dewatering).
- Request Element #5 - This element is focused on the fry/juvenile rearing lifestage, although it does not specify species or runs to be addressed. The primary fry/juvenile rearing-specific information requested by NMFS as part of this element pertaining to the Yuba River downstream of Englebright Dam includes assessments of rearing habitat characterization, rearing habitat suitability and potential relationships between rearing habitat availability/suitability and flows and water temperatures, BMI food availability and fry/juvenile growth and condition.
- Request Element #6 - This element is focused on the fry/juvenile outmigration lifestage, although it does not specify species or runs to be addressed. The primary fry/juvenile outmigration-specific information requested by NMFS as part of this element pertaining to the Yuba River downstream of Englebright Dam includes assessments of the temporal distribution of outmigration, potential relationships between outmigration magnitude and timing and flow and water temperatures, and outmigrant fry/juvenile size and condition.
- Request Element #7 – This element is focused on using a population dynamics model to estimate carrying capacity of the lower Yuba River downstream of Englebright Dam.
- New Request Element #8 – The preamble to this new element (NMFS July 18, 2011 letter, Encl. A, p. 23) states that the objective is to identify and assess conditions in the immediate vicinity of the Narrows 2 Powerhouse, and how the facilities and operations impact anadromous fish. However, Element #8 is divided into seven sub-elements, and portions of those sub-elements do not pertain to the Narrows 2 Powerhouse or its facilities or operations, but instead pertain to facilities located both upstream and downstream of USACE's Englebright Dam. The portions of those sub-elements pertaining to Narrows 2 Powerhouse and anadromous fish are summarized as follows.
  - Request Element #8.1 - The primary purpose of this sub-element is to evaluate whether or not the various lifestages of anadromous fish are affected by Narrows II during operations – including transient operations involving start ups or shutdowns.
  - Request Element #8.2 - This sub-element is focused on conducting fish surveys to obtain information regarding the presence, absence, timing and abundance and migration behaviors of anadromous fish in the vicinity of Narrows II Powerhouse draft tube and outfall structure.

- Request Element #8.3 - This sub-element is further divided into three components.
    - Component #8.3(a) - This sub-element component is focused on characterizing physical aspects of Narrows II facilities, including hydraulic characterization in the vicinity of Narrows II facilities that may affect anadromous fish behavior (velocity, turbulence, temperature, seasonal flows, and "flow splits"), particularly whether operations affect fish passage past the facility.
    - Component #8.3(b) – This sub-element component is focused on obtaining definition of channel characteristics (e.g., widths, depths, velocities, temperatures) to enable an assessment as to whether or not operation of the facility inhibits the continuity of upstream and downstream fish passage.
    - Component #8.3(c) - This sub-element component is focused on a review of prevailing operational conditions at the tailrace/outfall of Narrows II with the objective to understand the historical incidence, or potential future likelihood, of fish stranding, mortality, or injury resulting from "false attraction" into the powerplant structures.
- Request Element #8.4 - This sub-element focuses on upstream reservoir fish habitat conditions.
- Request Element #8.5 - This sub-element focuses on fish habitat conditions in the vicinity of New Colgate Powerhouse upstream to New Bullards Bar Dam. Reference is also made to Our House Dam.
- Request Element #8.6 - This sub-element focuses on fish habitat conditions in the middle Yuba River.
- Request Element #8.7 - This sub-element focuses on fish habitat conditions in New Bullards Bar Reservoir.

NMFS estimated the cost to complete this study, without Element 8, is between $50,000 and $250,000. NMFS did not estimate the cost for Element 8.

ADOPTED WITH MODIFICATION. YCWA has not adopted the portions of the requested new study that pertain to anadromous fish passage at Englebright Dam or anadromous fish upstream of Englebright Dam for the reasons described in Section 3.2.2.1, above.

YCWA has not adopted major portions of NMFS's requested study for the reasons described below. YCWA has adopted portions of some of NMFS's requested study considerations in Study 7.8 – ESA/CESA-Listed Salmonids Downstream of Englebright Dam. Replies to the portions of the requested new study that do not pertain to anadromous fish passage at Englebright Dam and anadromous fish upstream of Englebright Dam and YCWA's are provided below.

YCWA believes that the compilation of existing and ongoing data collection activities and programs, as described in YCWA's proposed ESA and CESA Listed Salmonids Downstream of Englebright Dam Study (Study 7.8), and analyses and results presentation described therein,

sufficiently provide a comprehensive synthesis of potential Project effects on anadromous salmonids. NFMS states in its July 18, 2011 comment letter that… "*Nowhere in the Applicant's Study 7.8 does it propose to investigate the Project's effects on stream flow, temperature, sediment, riparian vegetation or woody debris, as they pertain to their effects on anadromous fish populations*." YCWA does not concur with this contention. Study 7.8, incorporated by reference, provides a website link to the analyses proposed to be conducted through the Yuba Accord Fisheries Agreement M&E Program, which includes each of the considerations included in NMFS's comment.

Moreover, in its July 18, 2011 comment letter, on page 23, NMFS states that Study 7.8 proposes to "merely synthesize existing data" and will not demonstrate Project effects on anadromous populations. YCWA also disagrees with this contention. As described in Study 7.8, a suite of data sources, including but not limited to previously collected data from numerous sources and ongoing monitoring efforts being conducted by CDFG, in association with data previously collected and ongoing data collection efforts by the RMT, will be compiled and analyzed as part of a synthesis report conducted under Study 7.8.

YCWA does not agree that carrying capacity estimation through the use of a population dynamics model is required to evaluate Project effects on anadromous salmonids in the Yuba River downstream of Englebright Dam. NMFS does not describe available existing information, nor does NMFS describe the proposed synthesis of all available information presently incorporated in YCWA's proposed ESA and CESA Listed Salmonids Below Englebright Dam Study (Study 7.8) that pertains to anadromous salmonids in the lower Yuba River. Therefore, NMFS has not explained or justified the need for additional information consistent with FERC Criterion 4.

With respect to Criterion 5, project nexus and how the information would inform license requirements, as discussed in the Proposed Study Plan NMFS has included in its request dams (e.g., Daguerre Point Dam) and powerhouses (e.g., PG&E's Narrows 1) that are not Project facilities, and therefore does not appropriately explain the nexus between Project operations and effects on the resources to be studied or how the study results would inform the development of license requirements.

With respect to Criterion 7, NMFS does not provide details regarding the manner in which the cost estimate was derived, nor explain why it includes such a large range of cost. There are two major categories of cost associated with study NMFS's Request #8 – synthesis of information and carrying capacity estimation via application of a population dynamics model. Each of these components may more realistically require or exceed the upper range of NMFS's cost estimate. YCWA anticipates that the cost to perform NMFS's Request #8 would be significantly higher than the cost estimated by NMFS, and potentially could be 10 times or more greater than the lower range provided by NMFS. Also, NMFS did not estimate the cost for the New Request Element #8.

YCWA agrees with NMFS's July 18, 2011 request that the synthesis report (Study 7.8) should incorporate and integrate the results of other relevant studies pertinent to anadromous salmonids below Englebright Dam proposed in the ILP. Therefore, YCWA will modify Study 7.8 to specifically include reference to the incorporation and integration of applicable and relevant

results emanating from ILP studies conducted downstream of Englebright Dam potentially including: Channel Morphology Downstream of Englebright Dam (Study 1.2); Water Balance/Operations Model (Study 2.2); Water Quality (Study 2.3); Water Temperature Monitoring (Study 2.5); Water Temperature Model (Study 2.6); Aquatic Macroinvertebrates Downstream of Englebright Dam (Study 3.2); Non-ESA Listed Fish Populations Downstream of Englebright Dam Study 3.9); Riparian Habitat Downstream of Englebright Dam (Study 6.2); Narrows 2 Powerhouse Intake (Study 7.2); Instream Flow for Steelhead and Chinook Salmon Downstream of Englebright Dam (Study 7.10; and Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration (Study 7.11).

Regarding NMFS's New Request Element #8, YCWA will address portions of NMFS's Request Elements #8.1 and 8.3, including Components #8.3(a), #8.3(b), and #8.3(c), as described above, as part of the Revised Study Plan's new Assessment of Narrows 2 Powerhouse as a Barrier to Anadromous Fish Upstream Migration (Study 7.11).

3.2.2.8 Estimation of Downstream Migration *O. mykiss* in the Yuba River (*Request for a New Study*)

USFWS requested a new study named *Estimation of Downstream Migration of O. mykiss in the Yuba River,* for which USFWS included a detailed study proposal in its comment letter (USFWS, Enclosure 2). A similar study (*Determination of Anadromy in Yuba River O. mykiss*) was requested by USFWS as part of its comments on YCWA's PAD, and was not adopted by YCWA.[35]

In general, the purpose of USFWS's revised 2-year study (to begin in September 2011 and be completed by August 2013) is to determine the extent of *O. mykiss* attempts at downstream migration from Yuba River upstream of the Project to downstream of Englebright Dam, though analysis includes existing stations in California Fish Tracking Consortium (CFTC) program through the San Francisco Bay. The embedded assumption in the study premise is that rainbow trout upstream of the Project harbor some genetic drive to express anadromy, and the expression of that latent anadromy will be an attempt to migrate downstream presumably at the times that steelhead would actively migrate downstream. The study would include three steps:

- Task 1 – Install eight acoustic receivers: two in New Bullards Bar Reservoir, one near the North Yuba River inflow into the reservoir and one near the New Colgate Power Tunnel Intake structure; one in the Our House Diversion impoundment near the Lohman Ridge Diversion Tunnel Intake; one in the Log Cabin Diversion impoundment near the Camptonville Diversion Tunnel Intake; one in the Middle Yuba River near the confluence with the Yuba River; one in the Yuba River downstream of the New Colgate Powerhouse; and two in Englebright Reservoir, one near the Yuba River inflow into the reservoir an done

[35] See pages 3-49 and 3-51 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt USFWS's requested study when YCWA prepared its Proposed Study Plan.

near the Narrows 2 Intake structure. Check the acoustic receivers as well as CFTC monitors quarterly.

- Task 2 – Collect 100 *O. mykiss* (50 adult and 50 juvenile) from each of the following locations and tag each with acoustic tags: in the Middle Yuba River 1,000 to 2,000 meters upstream of Our House Diversion Dam; in the North Yuba River 1,000 to 2,000 meters upstream of New Bullards Bar Reservoir; and in the Yuba River 1,000 to 2,000 meters upstream of Englebright Reservoir.
- Task 3 – Collect caudal fin clips from all *O. mykiss* collected during the sampling for DNA archiving. USFWS does not state that the DNA analysis will occur as part of the study but implies it may be done in the future.

USFWS estimates the cost to complete this 2 year study is approximately $252,000.

In its July 17, 2011 letter, FWN stated it supported this study (FWN, pp. 1 & 2).

NOT ADOPTED. The requested study by USFWS offers little explanation of how the study will inform potential resource needs or PM&E's (Criterion 4) and also has significant technical flaws (Criterion 6). USFWS requests a study to be done to analyze the genetic structure of resident *O. mykiss* in the Yuba River and track movement to determine if anadromous behavior is being displayed. The purpose of the study offers little relevance to inform resource needs for YCWA (Criterion 5) and appears to be a "research" study. USFWS has suggested that the study will help to develop agency management goals, but this is not a FERC requirement for YCWA to address or provide. Further, upstream or downstream movement of *O. mykiss* has not been determined to be an indication of latent genetic anadromous characteristics that would indicate a need for fish passage. Therefore, whether the study showed downstream movement or not would offer little definitive information to result in a conclusion of anadromous fish being present. Recent genetic studies conducted by (Garza and Pierce, Undated) found that wild fish were present in the North Yuba River and that they were most related to Feather River *O. mykiss*, but did not conclude with any significance that anadromy genetic markers were present. Therefore, performing a fish passage study for anadromous fish that are not currently present in the Project is not justified.

From a technical perspective, there are also significant limitations to the proposed study plan methods. Fisheries sampling in the North, Middle, and South Yuba rivers show that adult fish are not abundant (NID and PG&E 2009). To collect 50 wild adult rainbow trout (half the number suggested by USFWS) within a few thousand meters of Project facilities would pose a significant challenge. Next, the application of acoustic telemetry would not effectively work in all the proposed locations. Acoustic telemetry is a good tool to monitor fish in relatively calm, quiet, and deep water. Shallow locations near Our House Diversion Dam are noisy (i.e., turbulent) and problematic, creating poor detection zones for acoustic telemetry. Regardless of these technical limitations, the purpose of the study is not relevant to YCWA's relicensing and does not warrant further investigation into how the study may be conducted.

3.2.2.9 Salmonid Floodplain/Off Channel Rearing Habitat (*Request for a New Study*)

USFWS requested a new study named *Salmonid Floodplain/Off Channel Rearing Habitat*, for which USFWS included a detailed study proposal in its comment letter (USFWS, Enclosure 1). A similar study (*Salmonid Floodplain Rearing*) was requested by USFWS as part of its comments on YCWA's PAD, and was not adopted by YCWA.[36]

In general, the purpose of USFWS's revised 3-year study (2011, 2012 and 2013) is to determine the Project-related effects on the amount, inundation frequency, and inundation period of off-channel rearing habitats used by fry and juvenile salmonids (adult and juvenile steelhead and adult and juvenile Chinook salmon [*O. tshawytscha*]). The study area is the Yuba River downstream of Englebright Dam. The study would include three tasks:

- Task 1 – In fall 2011, calculate and map "functional," "intermittent" and "areas of likely potential juvenile rearing utilization" floodplain areas.
- Task 2 – No work identified in this task.
- Task 3 – In fall 2011, develop and implement a new study proposal for work to be done in Task 3. The work includes subsampling "areas of likely potential juvenile rearing utilization" identified in Task 1, and may include snorkeling, electrofishing and seining at three locations during key months at three different flows per year in 2012 and 2013.

USFWS estimates the cost to complete this 3 year study is approximately $150,000.

In its July 17, 2011 letter, FWN stated it supported this study (FWN, pp. 2 & 3).

NOT ADOPTED: YCWA has held several meetings with USFWS regarding this study plan, including after the submission of comments by USFWS on YCWA's Proposed Study Plan. Ultimately, YCWA and USFWS agreed that several aspects of this study plan could be combined with YCWA's proposed Instream Flow for Steelhead and Chinook Salmon Downstream of Englebright Dam (Study 7.10). As a result, Study Plan 7.10 has been modified to include relevant aspects of the requested new Salmonid Floodplain/Off Channel Rearing Habitat, and a separate Salmonid Floodplain/Off Channel Rearing Habitat study is not adopted.

3.2.2.10 Angling (*Request for a New Study*)

FWN requested a new study named Angling (FWN, p. 20). The goal of the study would be to assess Project effects on angling, including under late spring and early summer flows. Objectives of the studies would be to determine the value, health and use of the fishery; and address fishing guides (e.g., number, number of angler days associated with fishing guides, and amount of annual revenue generated by fishing guides). FWN listed some fishing clubs that fish

[36] See pages 3-51 and 3-52 in YCWA's Proposed Study Plan for the reasons why YCWA did not adopt USFWS's requested study when YCWA prepared its Proposed Study Plan.

the river. FWN did not propose a specific study method or otherwise address any of FERC's Study Criteria. FWN did not estimate the cost to complete this requested study.

NOT ADOPTED. YCWA has not adopted FWN's request for a angling study since three of YCWA's proposed studies will address the majority of the data needs in the requested study and FWN's requested study does not address FERC Study Criteria 4, 6, and 7. YCWA's Recreation Flow Study (Study 8.2) will address Project effects on angling and describe the use of the fisheries in the Project-affected stream reaches through the angler focus group step in the study. In addition, YCWA's Recreation Use and Visitor Survey Study (Study 8.1) will characterize potential angling use a several study sites on Project-affected stream reaches through observation surveys. Finally, YCWA's Stream Fish Populations Above Englebright Study (Study 3.8) will address the health by characterizing the fish species composition, estimate total or relative abundance of fish by species, and analyze fish population size-structure and age-class structure. Regarding the value of the fishery, FWN does not provide any explanation of how such data will inform potential resource needs or PM&E's (Criterion 4). Furthermore, FWN's requested study does not address FERC Criteria 6 and 7 since the requested study does not provide any detailed study methodology and consideration of level of effort and cost.

3.2.2.11 Deer Herd Migration Routes and Mule Deer Winter Range Access Assessment Study (*Request for a New Study*)

YCFG requested a new study named Mule Deer (YCFG Attachment 1).

The requested study by YCFG is the same as the one initially proposed in their comments on the Proposed Study Plan. According to YCFG, the purpose of the study would be to provide the necessary data to determine the Project's effects and/or cumulative effects on mule deer. The objectives of the study would be to determine: 1) migratory routes that may be in the Project Area and if the Project impacts those migratory routes, 2) impacts of the Project on the mule deer winter range and 3) impacts of the Project (if any) with respect to deer mortality related to drowning in reservoirs. YCFG states the data will aid CDFG in determining the effect of the deer herd management plan(s). While YCFG did not provide detailed methodology or a study plan specific to the Yuba River Development Project, they did include a copy of the study plan *Loyalton-Truckee Deer Herd Landscape Use Analysis*. YCFG indicated that the Loyalton-Truckee deer herd study would provide Licensee with the proper methodology and relevant cost analysis.

CDFG supported this request.

NOT ADOPTED. YCWA has not adopted YCFG's request for a new mule deer study because YCFG's study proposal has not adequately addressed FERC's study Criteria 4, 5, 6 and 7.

With regards to Criterion 4, YCFG has not described why the information provided in YCWA's PAD regarding mule deer (Section 7.4.5.2, Wildlife Resources in Project Area) is not adequate to meet the information needs for relicensing. FERC and the reviewing courts have held that existing conditions are the proper baseline in the context of relicensing. Deer mortality due to the Project has never been observed. YCWA does not propose any action that would result in a

change to current conditions and therefore the Project would not have an effect on currently available mule deer wintering habitat, winter range, or seasonal migration patterns.

With respect to YCFG's comment, "…the data collected by this proposed study would aid CDFG in determining the effect of the deer herd management plan(s)." FERC policy and regulations indicate that studies conducted under relicensing should be specific as to how they would inform the development of license requirements, not support, or help to evaluate existing management plans.

With regards to Criterion 5, Project nexus and development of license requirements, YCFG has not adequately explained the nexus between Project operations and effects. A study request should not be for a study to determine if a Project effect, or nexus, might exist. If the study request is an attempt to search for a Project effect, then YCWA believes it does not meet the ILP criteria for a study request. There is no evidence that would suggest that mule deer are being impacted as a result of Project operations under current baseline conditions. As pointed out above, mule deer mortality as a result of Project facilities has never been observed, and the project does not contain any linear features such as canals or flumes, which are known to result in migration impedances and mortality. Also, how would the significance of any minor amount of mortality that might be detected from this mechanism be evaluated in a species that is legally hunted? If the effect of the Project were significant enough to threaten stability of deer populations, hunting would presumably not be allowed.

YCFG has not adequately explained how the study results would inform the development of license requirements, which they identify as payment of deer mitigation fees. Deer mitigation fees required by the 1996 Yuba County General Plan (Yuba County 1996) Policy (100-OSCP) do not apply to relicensing, as the proposed action (relicensing) does not include construction, preserves open-space, and is predominately located within federal lands.

With regards to Criteria 6 and 7, proposed study methodology and consideration of level of effort and cost, YCFG original comments identified radio tracking of mule deer and "raking and dusting" reservoir shorelines as potential methods. In YCFG's response to the Proposed Study Plan they provided a copy of the Loyalton-Truckee deer study as a template for development of the mule deer study for the Project. YCFG indicates that the Loyalton-Truckee deer study would provide the proper methodology (use of GPS tracking collars) and relevant cost analysis. The study provided by YCFG is a multi year study that is intended to identify migration routes in the vicinity of State Highway 89 and updating herd management plans, and to inform recommendations in support of continued development in Truckee and the State of Nevada. While the methods are acceptable for monitoring deer movement, with respect to ongoing impacts (e.g., vehicular collisions and new developments) they would not provide any additional information beyond what is obvious, and that is mule deer have integrated Project facilities into seasonal movement patterns. If in the future YCWA proposed to construct additional Project facilities the methods outlined would be appropriate for assessing their potential impacts and informing mitigation measures, but that is not the case. With respect to cost, YCFG only indicates that the Loyalton-Truckee deer study would provide a "relevant cost analysis" for the development of a study for the Project. However, without information such as the number of

mule deer required to adequately define migration routes or their use of the Project as wintering habitat, YCWA is unable to determine the cost of the proposed study.

3.3 List of Attachments to This Section

None.

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SECTION 4
MEETINGS AND REPORTS

This section describes YCWA's plan meetings (Section 4.1), Initial and Updated Study Reports (Section 4.2) and periodic progress reports (Section 4.3).

4.1 Meetings

YCWA plans, in collaboration with Relicensing Participants, to schedule meetings and conference calls as needed during performance of the studies. YCWA will adhere to the Relicensing Communication Guidelines in Section 2 of the PAD regarding the organization and format of these meetings**.**

4.2 Initial and Updated Study Reports

As required by 18 CFR § 5.11(c) and (f), YCWA plans to file with FERC and distribute to Relicensing Participants an Initial Study Report within 1 year of the date that FERC's Study Determination is deemed final, and an Updated Study Report within 2 years of FERC's Study Determination. Each report will describe YCWA's overall progress in implementing the studies, status of schedule, and a summary of data collected to date. Each report will also include a discussion of any variance from the FERC-approved study proposal and modifications to ongoing studies as well as any new studies proposed by YCWA.

YCWA considers the Initial and Updated study reports ***progress*** reports for the overall study effort - each report is intended to be filed during performance of the studies, not after all studies are complete. Also, YCWA intends that the Initial and Updated study reports address all ongoing studies during the period covered by the report.

YCWA intends to follow guidelines provided in 18 CFR § 5.15(c) and (f) regarding holding a meeting with Relicensing Participants within 15 days of filing the Initial and Updated study reports and filing with FERC a meeting summary within 15 days of the meeting. To the extent reasonably possible, YCWA will select the meeting dates collaboratively with Relicensing Participants.

4.3 Periodic Progress Reports

To supplement the information filed in the Initial and Updated study reports described above and in conformance with 18 CFR § 5.11(a)(3), YCWA plans to file with FERC two brief, written progress reports. The first report will be filed 6 months after FERC's Study Determination is deemed final and the second report will be filed 18 months after FERC's Study Determination is deemed final. In this manner, FERC will receive study progress reports every 6 months during the period in which studies are performed (i.e., a progress report in 6 months, the Initial Study

Report in 12 months, a progress report in 18 months, and the updated Study Report in 24 months).

Both progress reports will describe the progress for each study and will provide key findings for ongoing studies, as they become available after quality control checking. Within 24 hours of filing the progress report with FERC, YCWA will post the report on its Relicensing Website and advise Relicensing Participants by email that the report is available on the website.

4.4 List of Attachments to This Section

None.

SECTION 5
STATUS OF ENHANCEMENTS

In Section 5 of the Proposed Study Plan, YCWA provided the status of YCWA's evaluation of potential physical enhancements (i.e., developmental enhancements) to increase Project power generation, and that the status of YCWA's evaluations would be reported in the Revised Study Plan. This section provides a status report regarding YCWA's preliminary evaluation of potential generation enhancements to the Project.

YCWA has evaluated and dismissed the following potential enhancements:

- Improve flow efficiency in the New Colgate Power Tunnel and Penstock
- Add a pumped storage development
- Construct new diversion dams and conduits on tributary streams to increase Project water supply

At this time and based on a cursory review, YCWA believes that these potential enhancements are unattractive, and YCWA does not plan to pursue them in the relicensing.

YCWA is in the process of further evaluating the following potential enhancements:

- Increase diversion capacities of the Lohman Ridge and Camptonville diversion tunnels
- Increase the storage capacity of New Bullards Bar Reservoir
- Add a tailwater depression system to the New Colgate Powerhouse
- Install minimum flow turbine/generator units on Project outlets
- Upgrade the Narrows 2 Powerhouse efficiency (e.g., new turbines and generator rewinds)
- Improve Project flood control operations, which may involve increasing the storage capacity of New Bullards Bar Reservoir and/or modifying the existing New Bullards Bar Dam outlet or adding a new outlet
- Evaluate existing Project facilities to determine if some facilities and features are no longer used or useful.

YCWA will continue its evaluation of the above potential enhancements.

At this time, YCWA believes that the studies included in this Revised Study Plan are adequate to provide any additional information required for the scope and geographic extent of potential effects of the above enhancements being evaluated.

YCWA reserves the right to consider enhancements originally eliminated from further analysis or additional generation enhancements to the Project as the relicensing proceeds and market conditions change.

SECTION 6

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