

Study 6.2
**RIPARIAN HABITAT
DOWNSTREAM OF ENGLEBRIGHT DAM**
November 2010

1.0 Project Nexus

Yuba County Water Agency's (YCWA or Licensee) continued operation and maintenance (O&M) of the existing Yuba River Development Project (Project) has a potential to affect riparian habitat downstream of Engelbright Dam.¹

2.0 Resource Management Goals of Agencies with Jurisdiction Over the Resource to be Studied

[Relicensing Participants - This section is a placeholder in the Pre-Application Document (PAD). Section 5.11(d)(2) of 18 CFR states that an applicant for a new license must in its proposed study "Address any known resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied." During 2010 study proposal development meetings, agencies advised Licensee that they would provide a brief written description of their jurisdiction over the resource to be addressed in this study. If provided before Licensee files its Proposed Study Plan and Licensee agrees with the description, Licensee will insert the brief description here stating the description was provided by that agency. If not, prior to issuing the Proposed Study Plan, Licensee will describe to the best of its knowledge and understanding the management goals of agencies that have jurisdiction over the resource addressed in this study. Licensee]

3.0 Existing Information and Need for Additional Information

At this time, several efforts are currently underway to document the status of riparian vegetation in the Yuba River downstream of Engelbright Dam. The California Department of Fish and Game (CDFG) mapped all riparian habitats of the Central Valley starting in the 1977. This mapping effort used large categories of vegetation type (e.g., forest, shrub, herbaceous and bare gravel bar), and would be useful to assess large changes of riparian habitat over the last 20-30 years. Known as the Katibah maps after the principal investigator, these resources are reported to exist in CDFG archives as scanned images of variable quality spatial rectification. Licensee has not been able to obtain these.

CDFG is currently mapping riparian habitats throughout the Central Valley at a similar scale as the Katibah maps, but following the National Vegetation Classification Standard and the

¹ Engelbright Dam was constructed by the California Debris Commission in 1941, is owned, operated and maintained by the United States Army Corps of Engineers; and is not included as a Project facility in FERC licenses for the Yuba-River Development Project.

California Vegetation Manual. A GIS layer of these maps for the lower Yuba River up to Highway 20 is expected to be available in 2011 (Diana Hixon, pers comm.).

A riparian mapping project has been initiated by the Yuba Accord's River Management Team (RMT). The RMT has used Light Detection and Ranging (LiDAR) data for the entire riparian corridor up to Highway 20 to yield a map of riparian structure (i.e., height and density). The RMT plans to use ground data from CDFG with the LiDAR data to develop stand classifications following the California Vegetation Manual, yet one scale finer than that being produced by CDFG. This effort is targeted for completion in late 2010.

In addition, the RMT in conjunction with University of California at Davis and YCWA have developed a topographic map and two-dimensional hydrodynamic model of the Yuba River downstream of Englebright Dam as a basis for integrating and understanding riparian trends.

Also, an analysis of historic aerial photographs and maps of the lower Yuba dating from 1906 through 1998 will be undertaken as a joint project between the Yuba County Water Agency and the RMT. That effort should be completed by summer 2011.

Depending on the products that result from these various ongoing study efforts, Licensee anticipates an additional riparian data collection effort for the Yuba River downstream of Englebright Dam.

One challenge associated with understanding Project effects on riparian habitat in the lower Yuba River is parsing out the influences of the seminal events that have impacted the lower Yuba River. Prior to 1930, vast amounts of hydraulic mining settlement were deposited in the lower Yuba reach below what is now Englebright Dam. Starting in the late 1800s, large diversions from the Yuba River watershed were made to supply mining and agricultural interests outside of the watershed. The construction of Englebright Dam as a sediment barrier, and the subsequent sediment starvation of the lower Yuba immediately downstream of Englebright Dam, occurred in 1941. These major events have had substantial, and complexly interrelated, impacts on the riparian vegetation for the Yuba River downstream of Englebright Dam.

4.0 Study Goals and Objectives

The goal of the study is to characterize, to the extent necessary for Relicensing, riparian habitat in the Yuba River downstream of Englebright Dam.

The objective of the study is to collect information to meet the study goals.

5.0 Study Methods and Analysis

5.1 Study Area

For the purpose of this study, the study area includes the Yuba River from Englebright Dam to USACE's Daguerre Point Dam.

If YCWA proposes an addition to the Project, the study area will be expanded if necessary to include areas potentially affected by the addition.

5.2 General Concepts and Procedures

The following general concepts and practices apply to the study:

- Personal safety is the most important consideration of each fieldwork team.
- Licensee will make a good faith effort to obtain permission to access private property where needed well in advance of entering the property.
- Field crews may make minor variances to the FERC-approved study in the field to accommodate actual field conditions and unforeseen problems. When minor variances are made, Licensee's field crew will follow the protocols in the FERC-approved study.
- When Licensee becomes aware of major variances to the FERC-approved study, Licensee will issue an e-mail to the Relicensing Contact List describing the variance and reason for the variance. Licensee will contact by phone the Forest Service (if the variance is on National Forest System land), USFWS, SWRCB and CDFG to provide an opportunity for input regarding how to address the variance. Licensee will issue an e-mail to the Relicensing Contact List advising them of the resolution of the variance. Licensee will summarize in the final study report all variances and resolutions.
- Licensee's performance of the study does not presume that Licensee is responsible in whole or in part for measures that may arise from the study.
- Global Positioning System (GPS) data will be collected using either a Map Grade Trimble GPS (sub-meter data collection accuracy under ideal conditions), a Recreation Grade Garmin GPS unit (3 meter data collection accuracy under ideal conditions), or similar units. GPS data will be post-processed and exported from the GPS unit into Geographic Information System (GIS) compatible file format in an appropriate coordinate system using desktop software. The resulting GIS file will then be reviewed by both field staff and Licensee's relicensing GIS analyst. Metadata will be developed for deliverable GIS data sets.
- Licensee's field crews will record incidental observations of aquatic and wildlife species observed during the performance of this study. All incidental observations will be reported in the appropriate Licensee report (e.g., incidental observations of special-status fish recorded during fieldwork for the Special-Status Turtles – Western Pond Turtle Study will be reported in Licensee's Stream Fish Populations Study report). The purpose of this effort is not to conduct a focus study (i.e., no effort in addition the specific field tasks identified for the specific study) or to make all field crews experts in identifying all species, but only to opportunistically gather data during the performance of the study.
- Field crews will be trained on and provided with materials (e.g. Quat) for decontaminating their boots, waders, and other equipment between study sites. Major concerns are amphibian chytrid fungus, and invasive invertebrates (e.g. zebra mussel, *Dreissena polymorpha*). This is of primary importance when moving: 1) between tributaries and mainstem reaches; 2)

moving between basins (e.g. Middle Yuba River, Yuba River, and North Yuba River); and 3) moving between isolated wetlands or ponds and river or stream environments.

5.3 Study Methods

[Relicensing Participants – Based on the anticipated results from the studies and data collection efforts currently underway by the RMT, CDFG, and others, and preliminary discussions with Relicensing Participants, the following additional study elements may be incorporated into a Relicensing riparian vegetation study plan for the Yuba River downstream of Englebright Dam:

- Incorporation of the historic aerials analysis into the existing GIS database for the lower Yuba River, and an analysis of morphological changes and riparian cover through time. A series of specific cross-sections may be selected and channel meander and riparian cover compared between aerial photography intervals. The timing of major flood events may also be considered in the analysis.
- Corroborate changes in riparian stand type utilizing large woody species. Fremont cottonwood and white alder age structure along the lower Yuba River can be evaluated to determine the regeneration frequency of these two common and dominant woody plants. Tree diameter and tree cores may be used to define a range of diameters associated with each age class of trees sampled. This size/age relationship may be used to interpolate riparian propagation between sets of aerial photographs and major flood events.
- If mapping, two-dimensional model and hydrographic records are sufficiently precise, riparian recruitment trends may be analyzed as a tabletop exercise. If additional recent riparian recruitment data are necessary, then transects representing different morphological conditions of bank-full width versus floodplain topography may be assessed along the river corridor. Bands of a specific width may be delineated following standard sampling methods; specific woody riparian plant measures may include species, rooting location, height and root collar diameter, and age estimates. Transect species composition and age may be related to recent (past 5 years) hydrologic records.

Licensee is committed to collecting riparian habitat information in the Yuba River downstream of Englebright Dam to the extent necessary to support Relicensing, and intends to discuss methods and analysis with Relicensing Participants and include in Licensee's Proposed Study Plan a detailed study proposal for Riparian Habitat Downstream of Englebright Dam. Licensee]

6.0 Study Proposal Consultation

[Relicensing Participants – To be completed. Licensee]

7.0 **Schedule**

[Relicensing Participants – To be completed. However, Licensee expects the study to begin in October 2011 following FERC’s Study Determination and be completed by October 2012, when Licensee files with FERC its Initial Study Report. Licensee]

8.0 **Consistency of Methodology with Generally Accepted Scientific Practices**

[Relicensing Participants – To be completed. Licensee]

9.0 **Level of Effort and Cost**

[Relicensing Participants – YCWA will include a cost range estimate for this study in its Proposed Study Plan. Licensee]

10.0 **References Cited**

[Relicensing Participants – To be completed. Licensee]

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