Study 6.2

RIPARIAN HABITAT DOWNSTREAM OF ENGLEBRIGHT DAM[1,2]

March 2012

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 Englebright Dam.[3]

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

YCWA believes that four agencies have jurisdiction over riparian habitat potentially affected in the geographic area included in this study: 1) United States Department of Interior, Fish and Wildlife Service (USFWS); 2) United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); 3) California Department of Fish and Game (CDFG); and 4) State Water Resources Control Board, Division of Water Rights (SWRCB). Each of these agencies and their jurisdiction and management direction, as understood by YCWA at this time, is discussed below.

USFWS

USFWS's jurisdiction and goals and objectives are described by USFWS on pages 1 through 3 of USFWS's March 7, 2011 letter to the Federal Energy Regulatory Commission (FERC) that provided USFWS's comments on YCWA's Pre-Application Document, or PAD (YCWA 2010). USFWS's jurisdiction, goals and objectives are not repeated here.

NMFS

NMFS's statutory authorities and responsibilities are described by NMFS in Section 2.0 of Enclosure A in NMFS's March 7, 2011 letter to FERC providing NMFS's comments on YCWA's PAD. NMFS's jurisdiction and responsibilities are not repeated here.

[1] YCWA included a Riparian Habitat Downstream of Englebright Dam Study in its August 2011 Revised Study Plan. FERC's September 30, 2011 Study Determination required modifications to the study. YCWA filed a modified Study with FERC on March 8, 2012, and the modified Study was approved by FERC on May 14, 2012 without modification. This Study includes the modifications.

[2] Where this study proposal states that information for the study is being developed by the Lower Yuba River Accord River Management Team (RMT), if the RMT does not develop the information as described in this study proposal, YCWA will develop the information. 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 report (i.e., study technical memorandum). Further, if this study relies on information from RMT data, report or analytics, YCWA will attach the relevant RMT report to the relicensing final study technical memorandum.

[3] Englebright 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.

CDFG
CDFG's jurisdiction is described by CDFG on page 1 of CDFG's March 2, 2011 letter to FERC providing CDFG's comments on YCWA's PAD. CDFG's goal, as described on page 2 of CDFG's letter is to preserve, protect, and as needed, to restore habitat necessary to support native fish, wildlife and plant species.

SWRCB
SWRCB has authority under the federal Clean Water Act (33 U.S.C. §11251-1357) to restore and maintain the chemical, physical and biological integrity of the Nation's waters. Throughout the relicensing process the SWRCB maintains independent regulatory authority to condition the operation of the Project to protect water quality and the beneficial uses of stream reaches consistent with Section 401 of the federal Clean Water Act, the Regional Water Quality Control Board Basin Plans, State Water Board regulations, the California Environmental Quality Act, and any other applicable state law.

3.0 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 the United States Army Corps of Engineer's (USACE) Englebright Dam and potentially affected by continued Project O&M.

The objective of the study is to collect information to meet the study goals, including:

- Determine riparian vegetation composition and age class structure, including regeneration and germination
- Evaluate trends in riparian health and factors contributing to riparian conditions in the Study Area

4.0 Existing Information and Need for Additional Information

The Yuba River between Englebright Dam and the Marysville Gage has a long history of anthropogenic disturbance, primarily related to industrial gold mining efforts. Multiple diversions were created beginning during the late 1800s to supply mining and agricultural interests outside of the Yuba River watershed. Hydraulic mining operations continuing through the 1930s deposited vast amounts of sediment throughout the lower Yuba River. The USACE put Englebright Dam into service in 1941 as a sediment barrier, which subsequently depleted downstream areas of sediment input. The landscape in this area is recognized as highly disturbed from these historical uses, with the riparian habitat capability greatly reduced from pristine conditions. Several efforts are have been made or are currently underway to document the status of riparian vegetation in the Yuba River downstream of Englebright Dam, as identified immediately below. All accessible information useful to understanding Project effects will be utilized in this study.

- CDFG mapped all riparian habitats of the Central Valley starting in the 1977 (Nelson and Nelson 1984). This mapping effort used large categories of vegetation type (e.g., forest, shrub, herbaceous and bare gravel bar), and is 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. YCWA has not been able to obtain these at this time.
- 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 California Vegetation Manual (Sawyer et al. 2009). A Geographic Information System (GIS) layer of these maps for the lower Yuba River up to Highway 20 is expected to be available in 2012 (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.
- The RMT, in conjunction with University of California at Davis and YCWA, have developed a topographic map and two-dimensional hydrodynamic model (SRH-2D) of the Yuba River downstream of Englebright Dam (M&E Program 2010) as a basis for integrating and understanding riparian trends.
- 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 YCWA and the RMT. That effort is anticipated to be complete in summer 2012 (James et al. 2009).
- Low-altitude aerial video of the lower Yuba River (YCWA 2009).
- Topographic and geologic maps, including a digital elevation model (DEM) of the Yuba River downstream of Englebright Dam (M&E Program 2010).
- A conceptual model for effects upon riparian habitat from dams, gold-mining activity and hydrologic alteration was developed as part of a study funded by USFWS's Anadromous Fish Restoration Program (CBEC 2010).
- YCWA's PAD contained information about the riparian vegetation mapped in the area of the Project, including CalVeg maps and National Wetland Inventory (NWI) maps on a 1:24,000 scale, shown with United States Geological Survey (USGS) topographic features and Project facilities. Section 7.6 of the PAD includes a table of NWI palustrine and riverine wetland types and acres within the Project Area[4] and the FERC Project Boundary.[5]

[4] For the purposes of this document, the Project Area is defined as the area within the Federal Energy Regulatory Commission (FERC) existing Project Boundary and the land immediately surrounding the FERC Project Boundary (i.e., within about 0.25 mile of the FERC Project Boundary) and includes Project-affected reaches between Project facilities and downstream to the next major water controlling feature or structure.

[5] The FERC Project Boundary is the area that YCWA uses for normal Project operations and maintenance, and is shown on Exhibits J, K, and G of the current license.

Based on NWI maps[6] (1987), there are approximately 40,417 feet and 125 acres of riverine wetlands within the Project Area, with approximately 8,044 feet and 54 acres within the FERC Project Boundary. Remaining NWI classified wetland habitats in the Project Area include approximately 63,926 feet and 13 acres of palustrine wetlands and approximately 4,635 acres of reservoir open water.

NWI riparian wetlands have been classified using aerial imagery but no ground-mapping data is known to exist to support this inventory. In addition, the site-specific assessments of riparian habitats or habitat condition within the FERC Project Boundary are not adequate for relicensing purposes. To achieve the study goals, additional information is needed.

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 (RM 24) to the Marysville Gage (RM 6.2).[7] The Study Area does not extend farther downstream because backwater effects of the Feather River may confound Project effects. The lateral boundaries of the Study Area extend to the toe slope of the river valley, training walls, or to a change from riparian species to upland species, whichever is the greater distance. For the purposes of this study, riparian plant species are defined by Reed (1998) or a similar reference.

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

[6] National Wetland Inventory (NWI) mapped distances and areas are presented in terms consistent with the information in YCWA's PAD.

[7] River miles (RM) were calculated using the National Hydrography Dataset (NHD) GIS data. River miles start at the confluence of a stream or river into another stream or river (river mile 0) and increase upstream to the terminus of the stream. River miles denoted here indicate the location as measured from the confluence of the Yuba River with the Feather River.

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 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. Upon request, GIS maps will be provided to agencies in a form, such as ESRI Shapefiles, GeoDatabases, or Coverage with appropriate metadata, that is useful for interactive data analysis and interpretation. Metadata will be Federal Geographic Data Committee compliant.[8]
- 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 to 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: 1) moving 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 Methods

The study will be implemented in one or two phases, as necessary. Phase one will be implemented in 2012 and includes five steps: 1) site selection 2) gather data and prepare for field effort; 3) conduct field surveys; 4) prepare data and quality assure/quality control (QA/QC) data; and 5) prepare report. Each step of this phase is described below in the remainder of the Methods Section, Steps 1-5.

Phase two of the study will be performed if YCWA and Relicensing Participants collaboratively agree that additional riparian information is needed and collaborative agreement on study methods is reached.

[8] The Forest Service and CDFG each requested that a copy of the GIS maps be provided to them when the maps are available.

5.3.1 Phase One

5.3.1.1 Step 1 - Site Selection

Riparian habitat study sites are generally selected within a reach to represent the range of channel and habitat types in the reach (Bovee 1997). The characteristic feature of a study reach is homogeneity of the channel structure and flow regime. The sites chosen will represent those sites most likely to exhibit effects of project features and operations on channel morphology and habitat features. Study sites will extend from the wetted edge of the river to the toe slope of the valley, training walls, or to a change from riparian species to upland species, whichever is the greater distance. For the purposes of this study, riparian plant species are defined by Reed (1998) or a similar reference.

The lower 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 reaches occurring within the study area are described as: 1) Englebright Dam, 2) the Narrows, 3) Timbucktoo Bend, 4) Parks Bar, 5) Dry Creek, 6) Daguerre Point Dam, 7) Hallwood, and 8) Marysville (Wyrick and Pasternack 2011) (Table 5.3.1-1).

Table 5.3.1-1. Lower Yuba River delineated reaches and proposed study site locations with relevant geomorphic characteristic information.[9]

Reach Name	Mean Valley Width (ft)	Bed Slope (%)	Thalweg Length (ft)	Average Bankfull Width[1] (ft)	Reach Length (ft)	Site Length[2] (ft)	Riparian Vegetation Study Site	LWM Study Site	Reach Starting Point Description
Englebright Dam	415	0.31	129,440-133,570	169	4,034	4,034	Yes	Yes	Englebright Dam
Narrows	298	--	122,735-129,440	125	6,082	6,082	Yes	Yes	Confluence with Deer Creek
Timbuctoo Bend	544	0.201	101,945-122,735	277	19,600	19,600	Yes	Yes	Onset of emergent gravel floodplain upstream of Blue Point Mine
Parks Bar	976	0.188	75,965-101,945	316	24,461	24,461	Yes	Yes	Highway 20 Bridge
Dry Creek	1,009	0.135	63,500-75,965	427	12,204	12,204	Yes	Yes	Confluence with Dry Creek
Daguerre Point Dam	1,472	0.176	45,000-63,500	393	17,485	17,485	Yes	Yes	Daguerre Point Dam
Hallwood	889	0.131	17,500-45,000	335	26,437	26,437	Yes	Yes	Slope break near Eddie Drive
Marysville	562	0.052	0 – 17,500	231	17,261	17,261	--	Yes	No evident feature

[1] Average bankfull widths were determined by Wyrick and Pasternack (2011) with the exception of the Narrows Reach, for which no bankfull width was provided. YCWA estimated the bankfull width for the Narrows Reach using aerial imagry and may change the bankfull width if field conditions indicate that the estimate is grossly in error.

[2] Riparian vegetation and LWM study site lengths are 20 times the average bankfull width for each reach.

[9] YCWA's Study 6.2 in its Revised Stud Plan included a more basic version of Table 5.3.1-1. In a letter dated February 16, 2012 letter, NMFS advised that *"…it is unclear whether plans are currently underway to establish riparian sites within the Narrows and Englebright Dam Reaches..."* The text has been modified to clarify the study site locations and details as recommended by NMFS.

A minimum of one study site will be placed in each of the remaining reaches occurring in the Study Area,[10] with the exception of the Marysville Reach, which is not proposed to be included because the backwater effects of the Feather River may confound Project effects. A total of seven study sites will be chosen to evaluate current conditions in riparian vegetation, and additional sites will be added if more are necessary to develop a complete characterization of the riparian habitats occurring within the Study Area. Areas devoid of vegetation will be incorporated to the extent necessary to determine potential causes for the lack of riparian habitat.

The Englebright and Narrows reaches are not expected to sustain substantive riparian habitat due to the confined, steep nature of the river canyon and the predominant bedrock substrate (Harris 1988). Bedrock channels are generally insensitive to short-term changes in sediment supply or discharge. Only a persistent decrease in discharge and/or an increase in sediment supply sufficient to convert the channel to an alluvial morphology would significantly alter bedrock channels (Montgomery and Buffington 1999). However, it is important to survey different reaches based on differences in channel geometry, slope, and riparian vegetation to observe effects of Project operation on riparian extent and health. If safe access is not available in Englebright or Narrows reaches, YCWA will provide site-specific information to better characterize the geomorphology of these two reaches to show whether these reaches are capable of supporting extensive riparian vegetation.

5.3.1.2 Step 2 – Collect and Review Existing Data and Information

Existing data, including GIS data, historical information, reports, maps, aerial photography and all other information listed in Section 4.0, Existing Information and Need for Additional Information, relevant to riparian vegetation will be reviewed and examined in preparation for field efforts. These sources are expected to provide documentation on relevant geomorphology, topography, soils, riparian vegetation coverage and type, invasive species, and land-use (i.e., mining, timber management, recreation, road development, fires, grazing, and water diversions). This information will be employed during ground-truthing surveys, site analysis and in the creation of vegetation mapping products and is expected to increase the general understanding of the riparian systems being examined. The current condition of the riparian habitat occurring on the Yuba River will be assessed by combining existing information with field surveys.

5.3.1.3 Step 3 - Condition Assessment

Riparian areas are generally very dynamic, as seasons of drought or floods may desiccate or scour away otherwise healthy vegetation. Therefore, resilience to such events is important and can be assessed by riparian species abundance, richness, distribution and age structure. The health of a riparian community considers these factors in the context of providing resiliency to natural events, as well as structure or complexity for wildlife habitat.

[10] YCWA's Study 6.2 in its Revised Study Plan included five Riparian Sites. FERC's September 30, 2011 Study Determination directed that "*…modifications to section 5.3.1.1 of study 6.2 that would include the Englebright dam and Narrows reaches...*" (Appendix A, p 28). YCWA has modified the Study as directed by FERC.

Although each methodology is described in detail in the sub-sections that follow, an overview of the methods is provided in the bullets below. The information will be gathered at each study site determined in Step 1.

At each of the seven reaches, Englebright, Narrows,[11] Timbucktoo Bend, Parks Bar, Dry Creek, Daguerre Point Dam, and Hallwood (Wyrick and Pasternack 2011), the following methods will be performed:

- Vegetation Mapping
  - Field verifying LiDar and NAIP imagery (e.g., species abundance, richness, and distribution)
  - Size-class structure of riparian vegetation
  - Ground-truth vegetation mapping

- Inventory of Existing Cottonwood Stands
  - Size/age class inventory to determine when established
  - Extrapolate conditions under which cottonwoods established

- Elevation Model Topographic Map and Hydrodynamic Model
  - Inundation duration and frequency of riparian vegetation
  - Erosion, deposition, or other substrate movement as related to riparian vegetation

- Historical Aerial Photograph Analysis[12]
  - Examine what changes have taken place over time
  - When changes took place
  - Examine possible causes for changes

- Large Woody Material
  - Locations and physical characteristics of large wood
  - Function in the channel

- General Riparian Condition
  - Changes in channel and bank substrate (including any excessive erosion or deposition)
  - Land use activities
  - Unusual stress or mortality on riparian plant community
  - Riparian vegetative and hydrologic connectivity (or lack of)

[11] Existing RMT efforts and available information is concentrated in the unconfined, alluvial reaches on the lower Yuba below the Narrows Reach. LiDAR, vegetation mapping, historical aerial photographs, geomorphic and similar information may not be available for the Englebright and Narrows reaches that is available for the downstream reaches. Because available information and access to this area is limited, YCWA may develop methods on-site to best characterize the riparian vegetation in these reaches. The main concern regarding methods is the lack of geomorphic data that is used to develop flow relationships with the riparian vegetation. Channel morphology cross sections may be used to determine stage discharge relationships, but the confined nature of the channel in the Narrows and Englebright reaches may create conditions that are too deep and fast to safely survey cross sections.

[12] Historical aerial photograph analysis will be performed to the extent that historical aerial photographs are available for each reach.

5.3.1.3.1 Vegetation Mapping

Vegetation mapping will be performed by field verifying LiDar and NAIP imagery of the Study Area. Two sets of data will be collected during vegetation field-verification efforts: 1) individual trees/shrubs; and 2) vegetation patch types. This data will be used to calibrate an automatic algorithmic vegetation classification which will be applied to the aerial imagery of the survey area to result in a map of the vegetation present in the Study Area.

Individual tree/shrub data will verify the descriptive metrics of specific tree or shrub species identified on LiDAR and/or NAIP imagery. Data collection will include the canopy dimensions and location, mainstem location and diameter at breast-height (DBH), and dominant understory species. The canopy dimensions will include an estimate of the maximum height and a field-mapped polygon of the canopy perimeter. If physical access is limited in the field, or if satellite reception is blocked by the tree canopy, the mainstem location will be estimated and the canopy edge will be recorded by a minimum of four points at the canopy edge.

Vegetation patch type data will be used to verify areas of vegetation appearing to be similar on LiDAR and/or NAIP imagery. Patches occur when canopy structure is too unresolved to isolate individual trees with an appropriate level of accuracy. These vegetation patches will be identified and delineated into polygons prior to field efforts. Field verification efforts will include visual estimates of vegetation homogeneity within the delineated patch and among other vegetation patches of matching imagery. If the vegetation patch is too large to estimate accurately, the relevé method will be used to determine species composition and cover of woody plants. Vegetation patches may be re-delineated to match field conditions. Data collected within these patches will include woody vegetative species, percent cover, canopy height, canopy variability (emergents), dominant midstory species, and patch perimeter.

A representative number of samples will be taken from individual trees and vegetation patch types to accurately align the riparian vegetation with LiDAR and/or NAIP imagery and to precisely run an algorithmic vegetation mapping program. The data collection will be biased toward collecting individual tree/shrub data to validate the algorithmic vegetation classification because the cognition software delineates individual tree canopies, not patches like traditional methods. Thirty to 50 samples per species and vegetation patch type are expected, but may be modified if specific field needs are identified during field efforts. Ten percent of the data collection locations occurring within the upper six miles of the reach will be located to correspond with features identifiable on NAIP imagery for ensured vegetation mapping accuracy and co-rectification with LiDAR data. The Study Area will be stratified by environmental parameters (i.e., slope, aspect, distance from river, and geomorphically distinct reaches) and an effort will be made to collect samples from each representative stratum, as access allows.

A survey grade real time kinematic (RTK) GPS unit will be used for vegetation mapping efforts.

5.3.1.3.2 Inventory and Aging of Existing Cottonwood Stands

Cottonwoods are tall, fast growing riparian trees that colonize floodplain areas to create a host of riparian habitat benefits. They provide lateral stratification for wildlife habitat, shading for

understory development and stream cooling, as well as generating large woody material (LWM) which provides additional habitat and contributes organic matter. These trees are disturbance dependant, with seed dispersal following springtime peak flow events for establishment in recently scoured, wet areas of receding river flows. Because cottonwoods are often considered keystone species to Central California riparian habitats, a large knowledge base can be incorporated to better understand contributing factors to the current condition of riparian habitat.

As an extension of vegetation mapping, all cottonwood stands will be located and mapped. Aging of cottonwood trees will be performed by coring a limited sample of the cottonwood population (no more than 10%). Following the vegetation mapping and historic aerial analysis, YCWA will consult with Relicensing Participants on where (strata) and how many cottonwood cores to be taken with the goal of understanding the conditions under which the existing cottonwood stands became established. Coring will be limited for the purpose of budgeting.

Once the cored cottonwood trees are aged, an estimation of the age using size class structures will be performed to determine approximately when each stand was established and if recruitment continues within each stand. The age classes will be used to retrospectively extrapolate conditions that supported the successful establishment and maintenance of the stands.

5.3.1.3.3 Digital Elevation Model Topographic Map and Hydrodynamic Model

The digital elevation model two-dimensional topographic map developed by the RMT shows the micro-topography of the entire Lower Yuba River riparian corridor up to Highway 20 and is inclusive of the five lower reaches. LiDar produces images precise enough to determine vegetation types by heights (tree, shrub, or herb)[13] and the SRH-2D models hydrodynamic water surface levels of the channel and banks at various flow releases. This information will be used to verify other vegetation mapping efforts in conjunction with performing vegetation plots and may be used to quantify specific vegetation communities. Inundation levels will be modeled using the SRH-2D and will be used determine the potential to support riparian vegetation in unvegetated areas.

5.3.1.3.4 Historical Aerial Photograph Analysis

Historical aerial photograph analysis performed by James et al. (2009) for the RMT will examine what changes to riparian vegetation have taken place over time and when the changes happened. Timing in changes of the riparian vegetation can be referenced against such things as changes in river operations and major flood events and can be used to tease out potential Project effects.

5.3.1.3.5 Large Woody Material

LWM may play an important role in streams by shaping channel morphology, storing sediment and organic matter, and providing habitat for wildlife. YCWA will conduct LWM surveys

[13] YCWA's Study 6.2 in its Revised Study Plan did not provide a definition for "vegetation types by height." On page 4 of the USFWS's February 16, 2012 letter, the USFWS stated that *"…It is unclear what is meant by determining 'vegetation types by heights.'"* The text has been modified as recommended by the USFWS.

within eight reaches downstream of the Englebright Dam, including Englebright, the Narrows, Timbucktoo Bend, Parks Bar, Dry Creek, Daguerre Point Dam, Hallwood and Marysville reaches.[14] Each LWM study site will be 20 times bankfull width, or to the maximum length of each reach, whichever is less.[15] The width of each site will extend to bankfull width, as defined by Wyrick and Pasternack (2011) at modeled 5,000 cfs; Attachment 6-2A indicates each LWM site within each delineated reach. The sites were selected using a random number generator to determine the downstream starting location within each reach.[16]

LWM occurring within study sites will be counted as follows: all LWM greater than 3 ft in length within the active channel within four diameter classes (4-12 inches, 12-24 inches, 24-36 inches, and greater than 36 inches) and four length classes (3-25 ft, 25-50 ft, 50-75 ft, and greater than 75 ft). More detailed measurements will be taken for key pieces located within riparian habitat study sites. Key pieces of LWM are defined as pieces either longer than 1/2 times the bankfull width, or of sufficient size and/or are deposited in a manner that alters channel morphology and aquatic habitat (e.g., trapping sediment or altering flow patterns). Key piece characteristics to be recorded will include:

- piece location, either mapped onto aerial photos or documented with GPS
- piece length
- piece diameter
- piece orientation
- position relative to the channel
- whether the piece has a rootwad
- tree species or type (e.g., conifer or hardwood)
- whether the piece is associated with a jam or not
- the number of large pieces in the jam
- recruitment mechanism
- function in the channel

Additional information obtained from RMT LWM mapping in the lower Yuba River will be included as available. LWM information will be included in overall riparian assessment.

[14] YCWA's Study 6.2 in its Revised Study Plan included LWM sampling at two sites. FERC's September 30, 2011 Study Determination directed that *"…YCWA modify section 5.3.1.3.5 of study 6.2, Riparian Habitat Below Englebright Dam, for LWD sampling in the lower Yuba River to add six additional sites. Each of the eight LWD survey sites in the lower Yuba River should be located in differing morphological reaches, as identified in study 6.2."* (Appendix A, p 26). YCWA has modified the Study as directed by FERC.

[15] YCWA's Study 6.2 in its Revised Study Plan did not specify a length for LWM sites. FERC's September 30, 2011 Study Determination directed that *"…YCWA modify the methodology of section 5.3.1.3.5 of study 6.2, Riparian Habitat Below Englebright Dam, to indicate that the channel distance of any LWD survey site should be at least 20 times the bankfull width."* (Appendix A, p 26). YCWA has modified the Study as directed by FERC.

[16] YCWA's Study 6.2 in its Revised Study Plan did not provide a clear definition for the lateral study site boundaries. In a letter dated February 16, 2012 letter, NMFS recommended that *"…definition would be consistent with the approach in Study Plan 1.2, that will use model runs up to 5,000 cfs."* The text has been modified as recommended by NMFS.

5.3.1.4 Step 4 – Prepare Phase 1 Report and Collaborate Regarding Phase 2

At the conclusion of Phase 1, YCWA will prepare a report summarizing Phase 1, provide the report to Relicensing Participants, and meet with Relicensing Participants to discus the need for additional data collection. If YCWA and Relicensing Participants collaboratively agree additional data are needed, YCWA and Relicensing Participants will collaboratively develop the methods for Phase 2 (the methods may include greenline survey-type data collection), and YCWA will provide the methods to FERC for consideration. YCWA will implement Phase 2 as approved by FERC.

5.3.2 Step 4 – Prepare Data and Quality Assure/Quality Control Data

Following field surveys, YCWA will develop GIS maps depicting existing riparian habitat and other related information collected during the study. Field data will then be subject to QA/QC procedures, including spot-checks of transcription and comparison of GIS maps with field notes to verify locations of wetland and riparian sites found. YCWA will also produce a map for the study area that shows the extent of riparian vegetation as depicted on historic aerial photos compared to riparian vegetation extent depicted on recent aerial photos.

5.3.3 Step 5 – Prepare Report

YCWA will prepare a report that includes the following sections: 1) Study Goals and Objectives; 2) Methods; 3) Results; 4) Discussion; and 5) Description of Variances from the FERC-approved study proposal, if any. The report will include field data to support riparian condition assessment and riparian habitat maps.
The study report will focus on addressing the study goals using riparian vegetation composition, age class structure, and distribution to evaluate trends in riparian health and determine factors contributing to riparian conditions in the Study Area. These factors will be evaluated in a context of the functioning condition of the riparian habitat and what benefits (versus potential benefits) it provides to the biotic communities and abiotic systems of the Yuba River. Project effects and other current or historical land uses will also be incorporated to illustrate the best possible understanding of the conditions supporting or limiting the riparian habitat.

6.0 Study-Specific Consultation

The study includes the following study-specific consultation:

- Following the vegetation mapping and historic aerial analysis, YCWA will consult with Relicensing Participants on where (strata) and how many cottonwood cores to be taken with the goal of understanding the conditions under which the existing cottonwood stands became established. (Step 3.)
- YCWA will consult with NMFS to provide site-specific information to better characterize the geomorphology of the Englebright and Narrows reaches to show whether these reaches are

capable of supporting much extensive riparian vegetation, or if access to these reaches is not available.[17] (Step 3.)

- YCWA will prepare a report summarizing Phase 1, provide the report to Relicensing Participants, and meet with Relicensing Participants to discuss the need for additional data collection. If YCWA and Relicensing Participants collaboratively agree additional data are needed, YCWA and Relicensing Participants will collaboratively develop the methods for Phase 2 (the methods may include greenline survey-type data collection), and YCWA will provide the methods to FERC for consideration. YCWA will implement Phase 2 as approved by FERC. (Step 4.)

7.0 Schedule

FERC's December 8, 2011 letter required that YCWA provide a modified study to FERC for approval no later than March 8, 2012. YCWA may, at its own risk, and assuming Relicensing Participants cooperation, begin site selection (Step 1) in early 2012. The schedule provided below assumes FERC will approve the modified study no later than mid March 2012.

Site Selection (Step 1).....February 2012 – May 2012
Collect and Review Existing Data and Information (Step 2) .....April – August 2012
Condition Assessment (Step 3).....May – August 2012
Prepare and QA/QC Data (Step 4) .....October – November 2012
Study Report Preparation (Step 5)..... November 2012 – February 2013
Phase Two.....May – August 2013

8.0 Consistency of Methodology with Generally Accepted Scientific Practices

This study provides an assessment of potential Project effects on existing riparian vegetation and is consistent with the goals, objectives, and methods outlined for most recent FERC hydroelectric relicensing efforts in California. The proposed methodologies use standard assessment methods developed and used by federal land management agency personnel.

9.0 Level of Effort and Cost

YCWA estimates the cost to complete this study in 2011 dollars is between $110,000 and $140,000.[18]

[17] YCWA's Study 6.2 in its Revised Study Plan included five Riparian Sites. FERC's September 30, 2011 Study Determination directed that two additional sites be added with the recommendation "*We realize, however, that additional pre-survey information may be needed to better inform our recommendation to survey those* [Englebright Dam and Narrows] *reaches. Therefore, we recommend that YCWA, after consultation with NMFS, provide site-specific information to better characterize the geomorphology of these two reaches to show whether these reaches are capable of supporting much extensive riparian vegetation, or if access to these reaches is not available.*" (Appendix A, p 28). YCWA has modified the Study as directed by FERC.

10.0 Attachments

This study plan includes three attachments:

Attachment 6-2A Riparian Vegetation and LWM Site Figures 1-6

Attachment 6-2B Documentation of Transmittal of Draft Study Plan to USFWS, NMFS, SWRCB and CDFG

Attachment 6-2C Written Comments from USFWS, NMFS, CDFG and SWRCB

Attachment 6-2D YCWA's Reply to Written Comments

11.0 References Cited

CBEC. 2010. Rehabilitation Concepts for the Parks Bar to Hammon Bar Reach of the Lower Yuba River. Prepared by CBEC, Inc., Eco Engineering, South Yuba River Citizens League, and McBain & Trush, Inc.

Hixon, D. Personal communication (2011). Communication with RMT.

Harris, R. R. 1988. Associations between stream valley geomorphology and riparian vegetation as a basis for landscape analysis in eastern Sierra Nevada, California, USA. Environmental Management. 12:219-228.

James, L. A., M. B. Singer, S. Ghoshal, and M. Megison. 2009. Historical channel changes in the lower Yuba and Feather Rivers, California: Long-term effects of contrasting river-management strategies, in James, L.A., Rathburn, S.L., and Whittecar, G.R., eds., Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts: Geological Society of America Special Paper 451, p. 57–81, doi: 10.1130/2008.2451(04).

Lower Yuba River Accord, Resource Management Team (RMT). 2010. M&E Program.

Nelson, C. W. and J. R. Nelson. 1984. Central Valley Riparian Mapping Project. CDFG.

Reed Jr., P. B. 1988. National List of Plant Species that Occur in Wetlands. California (Region 0). U.S. Fish and Wildlife Service, Washington, DC, USA. Biol. Rep. 88 (24).

Sawyer, J.O., Keeler-Wolf, T., and Evans, J. 2009. A Manual of California Vegetation. California Native Plant Society Press, Sacramento.

Wyrick, J. and G. Pasternack. 2011. Lower Yuba Accord Monitoring and Evaluation Program, Spatial Structure Analysis Interim Report. Prepared for the Lower Yuba River Accord Planning Team.

Yuba County Water Agency (YCWA). 2009. Low-altitude video footage of Yuba Basin.

[18] YCWA's Riparian Habitat Downstream of Englebright Dam Study in its August 2011 Revised Study Plan had an estimate cost range of between $60,000 and $80,000. With the modifications required by FERC in its September 30, 2011 Study Determination, the estimated cost range is between $80,000 and $120,000.

_____. 2010. Yuba River Development Project Relicensing Pre-Application Document. Yuba County Water Agency, Marysville, CA. http://www.ycwa-relicensing.com.

Page Left Blank

ATTACHMENT 6-2A

Riparian Habitat Below Englebright
Riparian Vegetation and LWM Site Figures 1-6

Page Left Blank

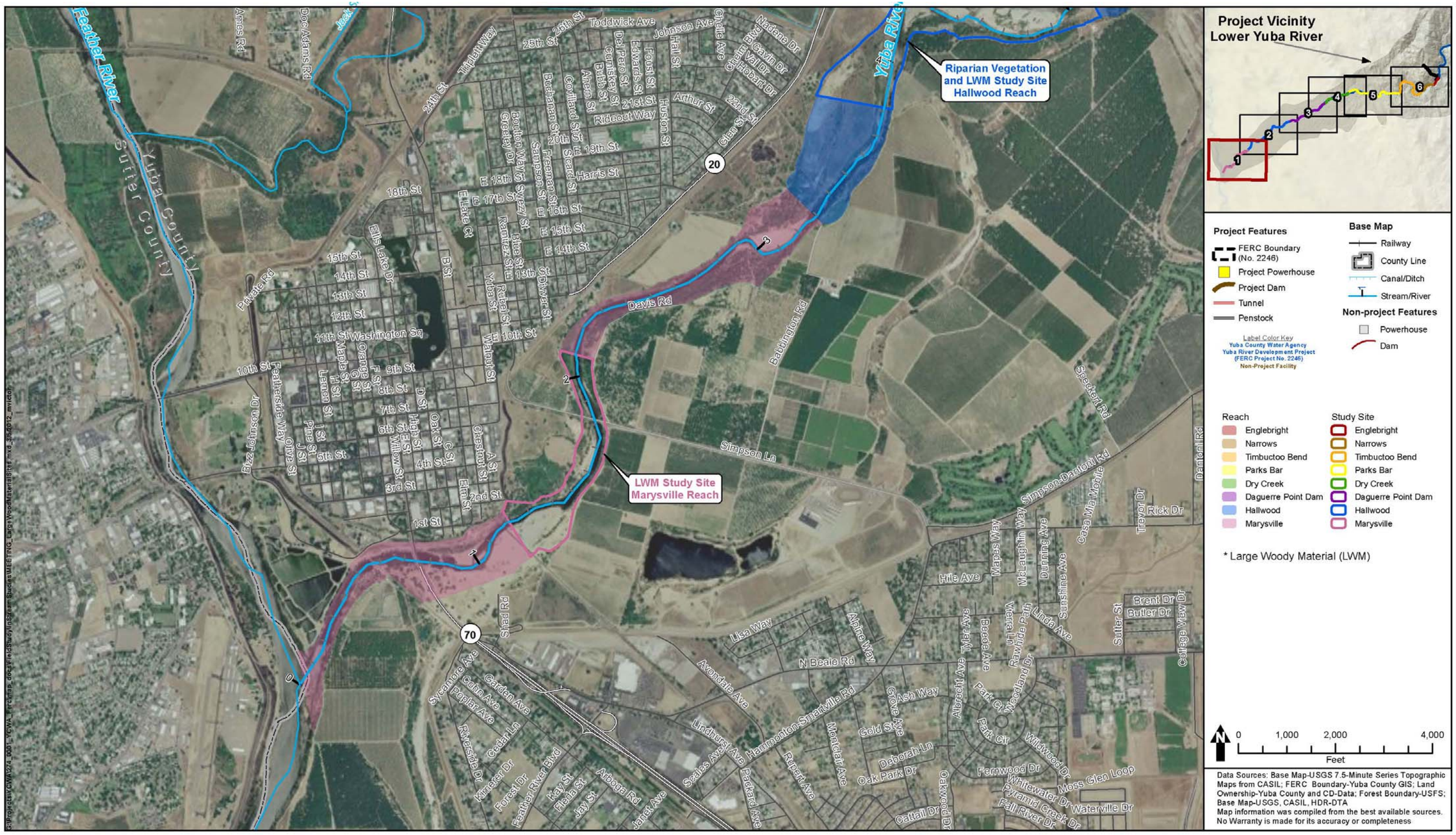

Figure 6.2A-1: Riparian Habitat Below Englebright Vegetation and LWM Sites. Map 1 of 6.

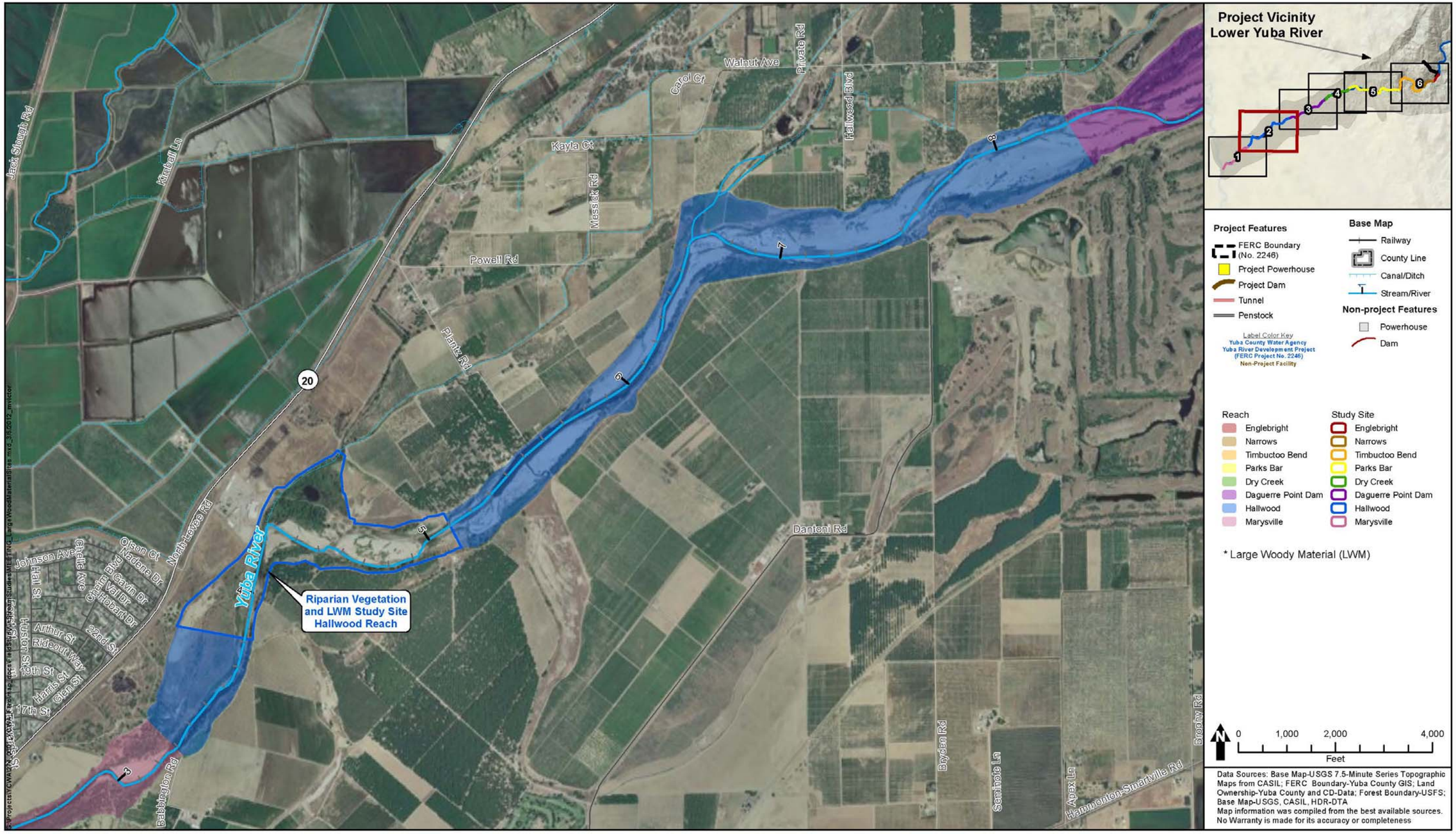

Figure 6.2A-2: Riparian Habitat Below Englebright Vegetation and LWM Sites. Map 2 of 6.

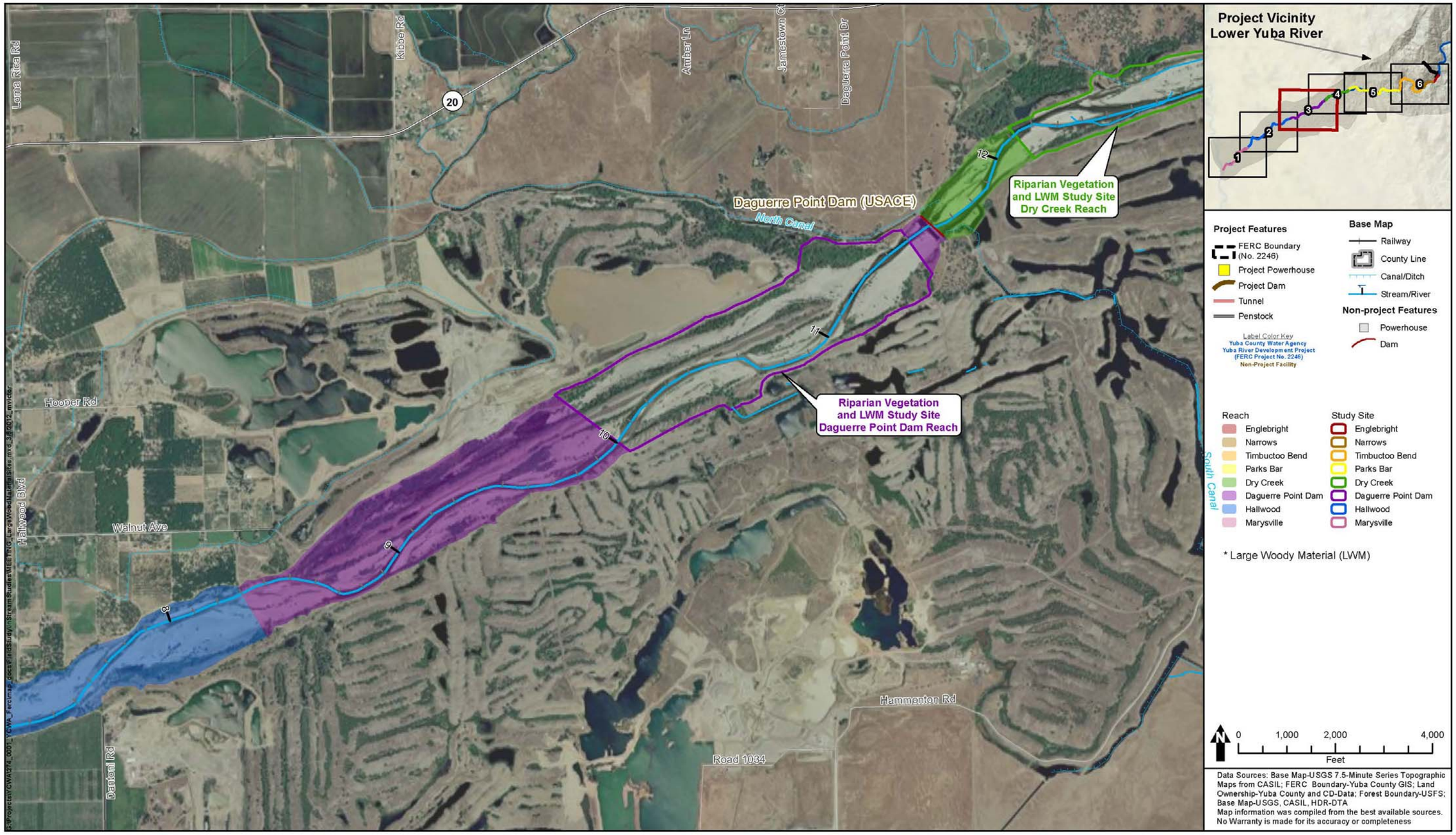

Figure 6.2A-3: Riparian Habitat Below Englebright Vegetation and LWM Sites. Map 3 of 6.

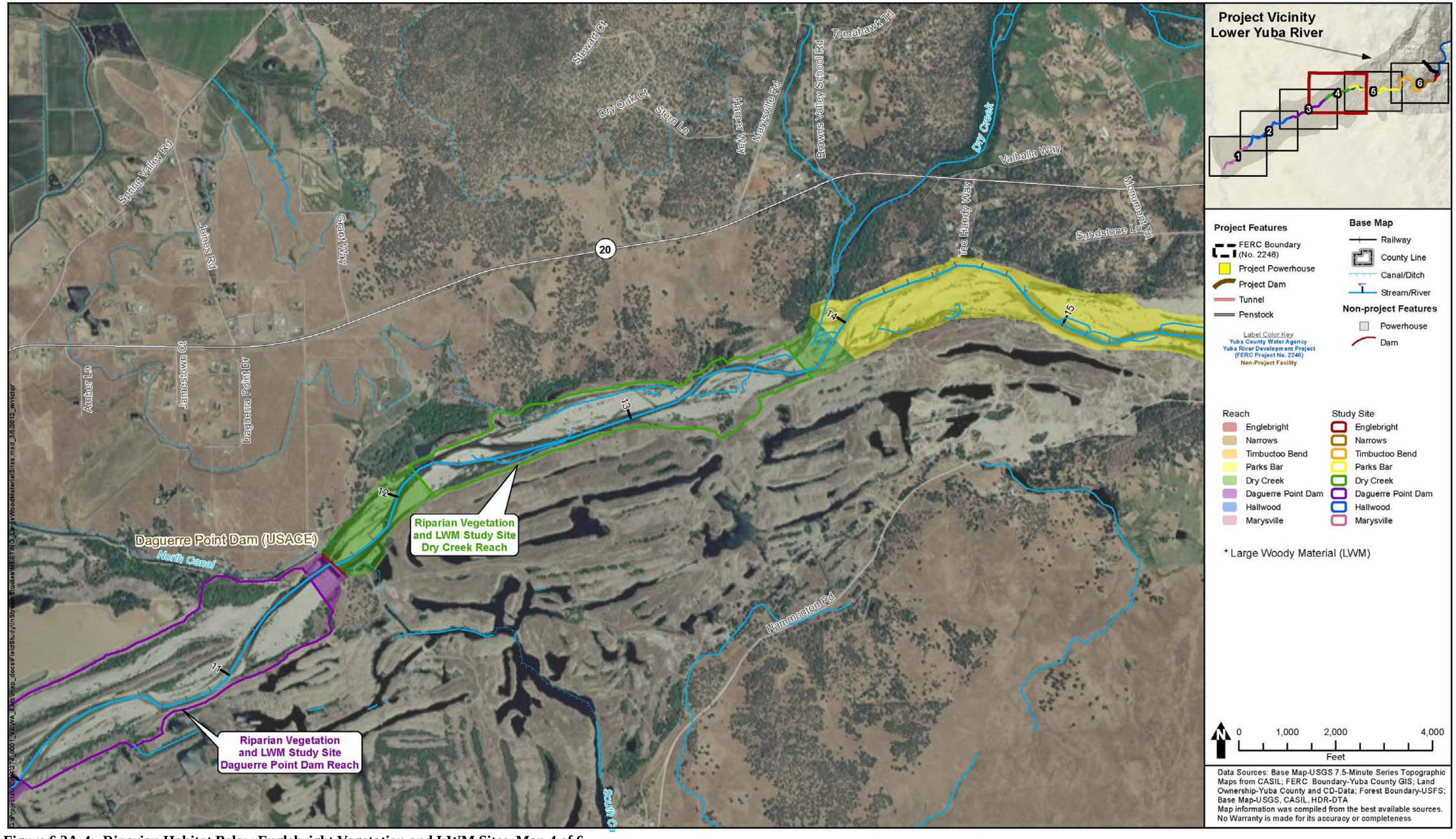

Figure 6.2A-4: Riparian Habitat Below Englebright Vegetation and LWM Sites. Map 4 of 6.

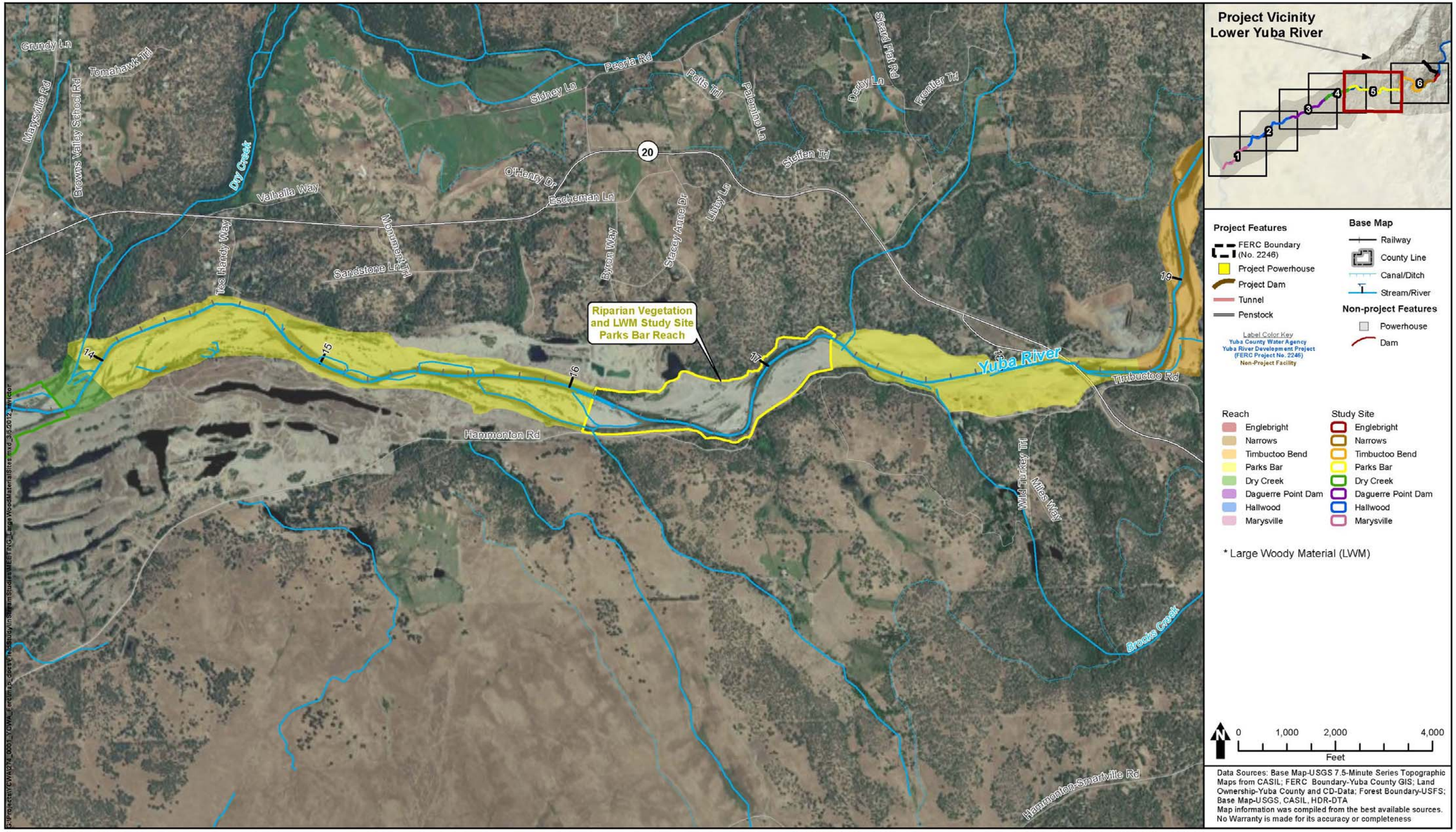

Figure 6.2A-5: Riparian Habitat Below Englebright Vegetation and LWM Sites. Map 5 of 6.

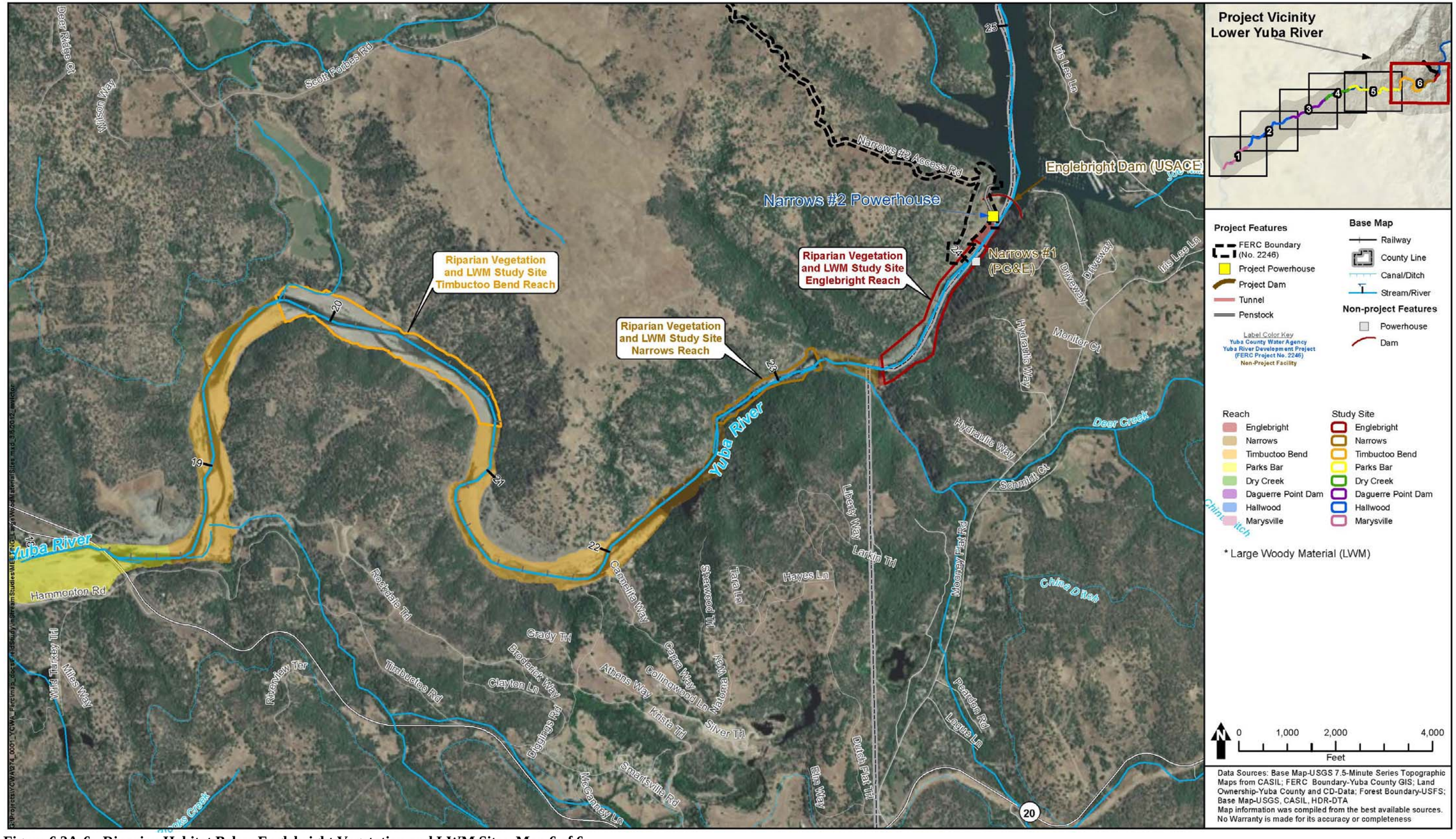

Figure 6.2A-6: Riparian Habitat Below Englebright Vegetation and LWM Sites. Map 6 of 6.

ATTACHMENT 6-2B

Transmittal of Draft Study Plan to USFWS, NMFS, SWRCB and CDFG

Page Left Blank

Lynch, Jim

From: Lynch, Jim
Sent: Saturday, January 14, 2012 12:26 PM
To: 'Daniel_Welsh@fws.gov'; 'ksmith@dfg.ca.gov'; 'alison_willy@fws.gov (Alison_Willy@fws.gov)'; 'Rick Wantuck'; 'Larry Thompson'; 'John Wooster'; 'JParks@waterboards.ca.gov'; 'MaryLisa Lynch'; 'Sharon Stohrer (SSTOHRER@dfg.ca.gov)'
Cc: 'caikens@ycwa.com'; 'Geoff Rabone'; 'Alan Mitchnick'; 'Kenneth Hogan'
Subject: Yuba Relicensing: Transmittal of Draft Study 6.2, Riparian Habitat Downstream of Englebright Dam for 30-Day Review Period
Attachments: Study 06-02 - Riparian Habitat Below Englebright - DRAFT - Modified per FERC 093011 Determination.doc

- YUBA RIVER DEVELOPMENT PROJECT RELICENSING -

Transmittal of Riparian Habitat Downstream of Englebright Dam Study (Study 6.2) Plan for 30-Day Review Period - Written Comments due to YCWA by Close of Business on February 13, 2012 -

On September 30, 2011, FERC's Director of Energy Projects issued a Study Determination related to Yuba County Water Agency's (YCWA) relicensing of its Yuba River Development Project, FERC Project 2246. The Determination required, among other things, that YCWA develop and file with FERC by December 29, 2011 (90 days from the date of the Determination) a modified plan for Study 6.2, Riparian Habitat Downstream of Englebright Dam Study (Study). The Determination also required YCWA to consult with the USFWS, NMFS, CDFG and SWRCB regarding at least parts of the Study, providing them 30 days to review the draft Study plan, and include evidence of consultation in YCWA's final plan filed with FERC.

On December 8, 2011, FERC issued a letter that revised the schedule for filing of the final Study with FERC from December 29, 2011 to March 8, 2012 (70 days from the date of the December 8 letter).

Attached to this e-mail for your review is a draft Study 6.2, Riparian Habitat Downstream of Englebright Dam Study in Microsoft Word™ format. We would appreciate your written comments on the draft Study plan no later than close of business on February 13, 2012, 30 days from the date of this e-mail.

We will address your written comments in the Study plan that we file with FERC, and attach your written comments to the Study plan we file. We may call you if we have any questions regarding your comments to be sure we understand them or to reconcile differences.

Note that some other studies for which FERC's Determination required YCWA to consult with agencies are in development and we will transmit our draft of those studies to you when they are available.

Let us know if there is anything we can do to facilitate your review.

If you have any questions about this e-mail, please contact Jim Lynch.

Curt Aikens
General Manager
Yuba County Water Agency
530-741-6278 x115

This e-mail sent on behalf of the above party by:

Senior Vice President, Hydropower Services

2379 Gateway Oaks, Suite 200 | Sacramento, CA 95833
916.564.4214 | d: 916.679.8740 |c: 916.802.6247
james.lynch@hdrinc.com | hdrinc.com

2

ATTACHMENT 6-2C

Written Comments from USFWS and NMFS[19]

[19] YCWA did not receive written comments from CDFG or SWRCB within the deadline for providing written comments on the draft modified study.

Page Left Blank

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:

FEB 16 2012

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

Subject: U.S. Fish and Wildlife Service Comments on Study Plan Determination Modifications for Study 1.2 Channel Morphology Downstream of Englebright Dam, Study 6.2 Riparian Habitat Downstream of Englebright Dam, and Study 7.12 Project Effects on Fish Facilities Associated with Daguerre Point Dam for the Yuba River Hydroelectric Project, Federal Energy Regulatory Commission Project 2246-058; Yuba, Sierra, and Nevada Counties, California

Dear Ms. Bose:

On September 30, 2011, the Director of Energy Projects for the Federal Energy Regulatory Commission (Commission or FERC) issued a Study Plan Determination for the Yuba County Water Agency's (YCWA or Applicant) application for new licensing of its Yuba River Hydroelectric Project, FERC Project 2246-058 (Project). The Determination required, among other things, that YCWA develop and file with FERC by December 29, 2011 (90 days from the date of the Determination) a modified plan for Study 1.2 Channel Morphology Downstream of Englebright Dam, Study 6.2 Riparian Habitat Downstream of Englebright Dam, and a new Study based on NMFS-1, Element #3 and #8, Evaluation of Project Effects on DaGuerre Point Dam's Fish Facilities. The Determination also required YCWA to consult with the U.S. Fish and Wildlife Service (Service or USFWS), the National Marine Fisheries Service (NMFS), California Department of Fish and Game (CDFG), and the California State Water Resources Control Board (SWRCB) regarding at least parts of the aforementioned studies, providing them 30 days to review the draft Study plan modifications, and incorporate or address any resource agency comments into the final plan filed with FERC. By letter filed October 28, 2011, YCWA requested a change in the deadline for filing some of the modified and new study plans, including Studies 1.2, 6.2 and a newly designated 7.12 that was based on NMFS-1(and which was referenced as Study 6.12 in YCWA's request). On December 8, 2011, FERC issued a letter that revised the schedule for filing of the final Study plans with FERC from December 29, 2011 to March 8, 2012 (70 days from the date of the December 8th letter).

As noted above, the Commission's Study Plan Determination required YCWA to allow at least thirty days for agency comment on the proposed modifications to the study plans. The following constitute the Service's comments on the proposed modifications to the above Study Plans. The Service submits these comments and recommendations under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.*), the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. § 661 *et seq.*), and the Federal Power Act (FPA) (16 U.S.C. § 791a, *et seq.*).

The information requested will inform the Service and the Commission in determining: (1) the effects of the Project on juvenile rearing of Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*O. mykiss*) in the lower river, because Project operations directly affect the amount and quality of rearing habitat available to Chinook salmon and steelhead; and (2) the extent that Project operations impede or otherwise influence upstream and downstream passage of Chinook salmon and steelhead adults and juveniles through the fish facilities at Daguerre Point Dam. The utility of implementing studies 1.2, 6.2, and 7.12 as they are currently described is unclear due to their generally broad goals and objectives and their lack of specificity. The Applicant needs to adequately describe the nexus between Project operations and effects (direct, indirect, and cumulative) on the resource to be studied (18 CFR § 5.11(d)(4)). The Project effects (direct, indirect, and/or cumulative) on in-channel habitat, riparian habitat, and fish passage should be described in further detail in each of the respective studies (18 CFR § 5.11(d)(4)).

Comments on Study Plan Determination Modifications

Study 1.2 – Channel Morphology Below Englebright

General Comment No. 1:

This is a very thorough study that proposes to primarily analyze sediment transport dynamics (i.e., erosion and deposition) over multiple scales. However, the title of Study 1.2: "Channel Morphology Downstream of Englebright Dam," is misleading, as Study 1.2 appears to be primarily focused on sediment transport dynamics as related to the contemporary Project-induced flow regime. Specifically, the study goals and objectives (Section 3.0) only mention "sediment dynamics" (i.e., substrate mobility; particle size distribution for salmonid spawning; spawning gravel distribution) and "spill flow effects on channel morphology in the Yuba River downstream of Englebright Dam" as the primary objectives. Furthermore, under the Study Methods section 5.3, floodplain (through 2D Hydrodynamic modeling), riparian, and large woody material (LWM) are all mentioned as components of the ongoing information collection effort to be utilized in Study 1.2. These processes are fundamental to any "channel morphology study" of a river system (Montgomery and Buffington 1998, Church 2002, Poole 2002, Montgomery and Piegay 2003, Kondolf et al. 2006), especially as they relate to aquatic habitat and fisheries (Schlosser 1991, Maddock 1999, Fausch et al. 2002, Thorp et al. 2006) and should be stated as such up front. However, no mention of any of these analyses is presented within the opening sections and they are not mentioned as specific objectives. Such geomorphological processes are fundamental to the currently stated goal of Study 1.2, which is to "quantify or characterize river form and process in the Yuba River downstream of the Englebright Dam, and

to assess potential impacts to the river form and process due to continued operation of the Project."

If Study 1.2 is to address all the elements of channel morphology, the Service suggests that these processes should be either included as part of the study objectives, or a new objective should be added specifically explaining that a synthesis of Study 1.2 with other studies (e.g., Study 6.2 - Riparian Habitat, Large Woody Material, Substrate and Cover Mapping) will be developed. For clarity purposes, the Service suggests describing these additional elements in more detail in Section 3.0.

General Comment No. 2:

The Applicant needs to adequately describe the nexus between Project operations and effects (direct, indirect, and cumulative) on the resource to be studied (18 CFR § 5.11(d)(4)). The Applicant also needs to further explain the Project effects (direct, indirect, and/or cumulative) on channel morphology downstream of Englebright Dam (CFR 18 § 5.11(d)(4)). The Applicant states that the continued operation and maintenance of the Project has the "potential" to affect channel morphology and fluvial processes but does not elaborate or explain how these processes are important to the various resources (i.e., T&E species, aquatic species, riparian plants, wildlife resources, migratory birds, etc.).

Study 6.2 – Riparian Habitat Below Englebright

General Comments:

We already suspect or know anecdotally and from a few cursory surveys that very few cottonwoods (mostly old) occur on the lower Yuba River, and that most of the willows are the shrubby, quick-colonizing species rather than the tree-like species. This study includes the necessary step of documenting the above existing conditions. More critical, however, the study should examine the effects of YCWA actions on cottonwood recruitment in the lower Yuba River. The effects of flow regime on cottonwood recruitment have been effectively studied in the Sacramento River (e.g., Roberts et al. 2002) and some of the same mechanisms may be at work in the lower Yuba River. However, non-flow related characteristics of the lower Yuba River (e.g., lack of fines, lack of sufficient parental stock, etc.) also may be limiting. It is not clear how the second objective of evaluating "trends in riparian health and factors contributing to riparian conditions in the Study Area" will be meaningfully accomplished with this study, as doing so would require parsing the effects of flow, substrate, parental stock, and other factors. The study objectives and methods should be refocused to conduct this sort of limiting factors analysis so Project effects can be identified.

Specific Comments:

Section 5.2 (General Concepts and Procedures).

Regarding the Global Positioning System (GPS) data collection methods (6th bullet): Will the selected 3 meter level of accuracy meet metadata requirements for use in ESRI Shapefiles and

GeoDatabases? Will map grade, survey grade, or recreation grade GPS units be needed? These vary in data quality and need to be selected beforehand. This comment also applies to Section 5.3.1.3.1 (Vegetation Mapping).
Regarding minimizing the chance of spreading non-native invasive species (8th bullet): It would be useful to develop and implement a Hazard Analysis Critical Control Point (HACCP) Plan which would indicate that zebra mussels are not a concern relative to this proposed study but that New Zealand mudsnails are a concern.

Section 5.3.1.1 (Step 1—Site Selection): The "wetted edge of the river" would be variable depending on water year and existing flow. An explicit methodology for addressing in-channel gravel bars, floodplain and emergent vegetation should be developed, and potential limitations of this protocol should be acknowledged.

Section 5.3.1.3.3 (Digital Elevation Model Topographic Map and Hydrodynamic Model): It is unclear what is meant by determining "vegetation types by heights." The usefulness of the existing LiDAR data set (now a few years old) for the lower Yuba River in classifying riparian vegetation types is still unclear. A recent symposium focusing on this data indicated difficulty in identifying species. Accuracy is much better for taller, isolated trees and is worse for smaller shrubby species. Cottonwood, Sycamore, Willow, and Other classes can be distinguished with "fair accuracy." New LiDAR technology is supposed to be much better.

Study 7.12 – Project Effects on Fish Facilities Associated with Daguerre Point Dam

General Comments:

As the Service indicated in its comments on the Preliminary Application Document (dated March 7, 2011), "the raised water elevation created by Daguerre Point Dam allows YCWA to divert water into the Browns Valley, Hallwood-Cordua, and South Yuba-Brophy diversions." Therefore, it is unclear why Project effects on the operation of the Hallwood-Cordua diversion fish screen are being addressed in this study and not the effects on South Yuba-Brophy and Browns Valley diversion fish screens. All three diversions rely on the presence of Daguerre Point Dam and screen efficiency may be affected by Project operations. Additionally, the Applicant should include an assessment on how the Project directly affects juvenile Chinook salmon and steelhead as outmigrants pass over Daguerre Point Dam. Juvenile mortality from predation as outmigrants pass over Daguerre Point Dam and improving efficiency of fish screening devices and fish bypasses were identified as limiting factors by the Service in the Final Restoration Plan for the Anadromous Fish Restoration Program (AFRP) (USFWS 1995, 2001), a comprehensive plan that has been filed with the Commission pursuant to §10(a)(2) of the Federal Power Act, 16 U.S.C. section 803(a)(2)(A). Consequently, all the existing information on the Project effects that are associated with Daguerre Point Dam that are described in both the AFRP Working Paper (USFWS 1995) and the Final Restoration Plan (USFWS 2001) should be included in Section 4.0 of the study plan and evaluated accordingly.

It is not clear how the various steps of Phase 1 of the proposed study will achieve its stated goal of determining if the Project adversely impacts "the efficiency of the fish facilities as designed." The potential impacts of the Project are described as "unknown," yet several are identified for consideration under Phase 2 which is proposed to occur only if "YCWA and Relicensing Participants collaboratively agree" that it should. Furthermore, the Applicant should elaborate and develop specific study objectives in Section 3.0. This should include a site specific assessment on each of the affected facilities as a separate objective (i.e., Daguerre Point Dam fish ladder, Daguerre Point Dam, Hallwood-Cordua Diversion fish screen, South Yuba-Brophy diversions, etc.).

The ideas identified for consideration under Phase 2 (e.g., examination of bathymetric and hydraulic profiles) actually can be investigated under Phase 1 using existing data (e.g., Deas 1999; USFWS 2010a,b,c; and mapping and modeling data available from the Yuba Accord River Management Team). Phase 1 of this study should be revised with this as its focus.

Specific Comments:

Section 5.3.1 (Phase 1 – Desktop Assessment): The term/concept "efficiency of the fish facilities" should be explained more fully. It is not clear how the activities described in this and subsequent steps will achieve the stated purpose of Phase 1. Presumably, the study is trying to identify what the potential adverse effects of the Yuba River Hydroelectric Project are on adult upstream fish passage, juvenile fish entrainment, or fish screen efficiency. Stating some hypotheses would greatly benefit this section and help direct the study.

Section 5.3.1.2 (Step 2 – Analysis of Collected Data): Simply describing and characterizing operations will not achieve the stated goal of this study. The real focus of this study should be to assess the effects of overall Project operation on the flow, stage, head difference, depth-velocity patterns, and temperature at Daguerre Point Dam.

Section 5.3.1 (Phase 2 – Field Assessment): Despite stating that the potential effects of the Project are "unknown," we do have some idea about what the potential effects might be. For example, Project operations may affect adult passage timing through the fish ladders by affecting attraction flows or the number and timing of juveniles entrained or bypassed in the Hallwood-Cordua diversion facility.

Conclusion

With some revision, the three proposed studies comprising the Study Plan Determination modifications have the potential to provide valuable results that will inform the development of Project license conditions. The Service has worked closely with other resource agencies and the Applicant, in order to design studies that would measure Project-level effects in a scientifically defensible manner and at a reasonable cost. The Service has worked with the Applicant in seeking solutions to Study Plan deficiencies and we appreciate the collaborative discussions in which all participants have engaged.

If you have any questions regarding this response, please contact Deborah Giglio of my staff at (916) 414-6600.

Sincerely,

Daniel Welsh
Assistant Field Supervisor

Enclosures

cc:
FERC #2246 Service List, Yuba River Hydroelectric Project

References

Church, M. 2002. Geomorphic thresholds in riverine landscapes. Freshwater Biology, 47, 541-557.

Deas, M.L. 1999. Yuba River temperature monitoring project. Report prepared for the U.S. Fish and Wildlife Service, Sacramento/San Joaquin River Fishery Restoration Office. February 28, 1999. 19 pages.

Fausch, K.D., Torgersen, C.E., Baxter, C.V. & Li, H.W. 2002. Landscapes to Riverscapes: Bridging the Gap between Research and Conservation of Stream Fishes. BioScience, 52, 483-498.

Kondolf, G.M., Boulton, A.J., O'Daniel, S., Poole, G.C., Rahel, F.J., Stanley, E.H., Wohl, E., Bang, A., Carlstrom, J., Cristoni, C., Huber, H., Koljonen, S., Louhi, P. & Nakamura, K. 2006. Process-Based Ecological River Restoration: Visualizing Three-Dimensional Connectivity and Dynamic Vectors to Recover Lost Linkages. Ecology and Society, 11, 5. [online] URL: http://www.ecologyandsociety.org/vol11/iss12/art15/.

Maddock, I. 1999. The importance of physical habitat assessment for evaluating river health. Freshwater Biology, 41, 373-391.

Montgomery, D.R. & Buffington, J.M. 1998. Channel processes, classification, and response. In: River Ecology and Management: Lessons from the Pacific Coastal Ecoregion. (edited by R.J. Naiman & R.E. Bilby). Springer-Verlag, New York, pp.13-42.

Montgomery, D.R. & Piégay, H. 2003. Wood in rivers: interactions with channel morphology and processes. Geomorphology, 51, 1-5.

Poole, G.C. 2002. Fluvial landscape ecology: Addressing uniqueness within the river discontinuum. Freshwater Biology, 47, 641-660.

Roberts, M.D., D.R. Peterson, D.E. Jukkola, and V.L. Snowden. 2002. A pilot investigation of cottonwood recruitment on the Sacramento River. The Nature Conservancy, Sacramento River Project. May 2002. Chico, California.

Schlosser, I.J. 1991. Stream Fish Ecology: A Landscape Perspective. BioScience, 41, 704-712.

Thorp, J.H., Thoms, M.C. & Delong, M.D. 2006. The Riverine Ecosystem Synthesis: Biocomplexity in river networks across space and time. River Research and Applications, 22, 123-147.

USFWS. 1995. Working paper on restoration needs: Habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volumes 1,2,3. May 9, 1995. Prepared for the U.S. Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program. Stockton, CA.

USFWS. 2001. Final Restoration Plan for the Anadromous Fish Restoration Program; A Plan to Increase Natural Production of Anadromous Fish in the Central Valley of California. January 9, 2001. Prepared for the U.S. Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program. Stockton, CA.

USFWS. 2010a. Flow-habitat relationships for spring- and fall-run Chinook salmon and steelhead/rainbow trout spawning in the Yuba River. Sacramento Fish and Wildlife Office, Planning and Instream Flow Branch. August 26, 2010.

USFWS. 2010b. Flow-habitat relationships for juvenile fall/spring-run Chinook salmon and steelhead/rainbow trout rearing in the Yuba River. Sacramento Fish and Wildlife Office, Planning and Instream Flow Branch. October 8, 2010.

USFWS. 2010c. Relationships between flow fluctuations and redd dewatering and juvenile stranding for Chinook salmon and steelhead/rainbow trout in the Yuba River. Sacramento Fish and Wildlife Office, Planning and Instream Flow Branch. September 15, 2010.

BEFORE THE
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

CERTIFICATE OF SERVICE

I hereby certify that U.S. Fish and Wildlife Service Comments on Study Plan Determination Modifications for Study 1.2 Channel Morphology Downstream of Englebright Dam, Study 6.2 Riparian Habitat Downstream of Englebright Dam, and Study 7.12 Project Effects on Fish Facilities Associated with Daguerre Point Dam for the Yuba River Hydroelectric Project, Federal Energy Regulatory Commission Project No. P-2246-058, Yuba, Sierra, and Nevada Counties, California has this day been electronically filed with the Federal Energy Regulatory Commission and electronically served on Parties indicating a willingness to receive electronic service and served, via deposit in U.S. mail, first-class postage paid, upon each other person designated on the service list for Project #2246-058 compiled by the Commission Secretary.

Dated at Sacramento, California, this 16th February, 2012.

Name: Heeja Seto
Heeja Seto
U.S. Fish and Wildlife Service
2800 Cottage Way, Rm. W-2605
Sacramento, CA 95825
(916) 414-6600

Page Left Blank

Pitts, Sheila

To: Bailey, Gaea
Subject: RE: Yuba Relicensing: Transmittal of Draft Study 6.2, Riparian Habitat Downstream of Englebright Dam for 30-Day Review Period

AMServiceURLStr: https://Slingshot.hdrinc.com/CFSS/control?view=services/FTService

From: John Wooster [mailto:john.wooster@noaa.gov]
Sent: Thursday, February 16, 2012 2:08 PM
To: Lynch, Jim; Kenneth Hogan; Alan Mitchnick
Cc: Larry Thompson; Richard Wantuck
Subject: Re: Yuba Relicensing: Transmittal of Draft Study 6.2, Riparian Habitat Downstream of Englebright Dam for 30-Day Review Period

Jim, Ken, and Alan,

I have two comments (see attached document) pertaining to Study Plan 6.2 that arose yesterday while reviewing the Channel Morphology Plan. While one is relatively straight forward, the other is not, as I believe there was a miscommunication pertaining to NMFS requesting riparian study sites in Narrows and Englebright Dam Reaches that stemmed from requesting LWM surveys in these reaches within the riparian study plan. Regrettably, I did not catch this sooner.

Please let NMFS know if additional clarification is needed.

-John Wooster
NMFS

On Sat, Jan 14, 2012 at 12:26 PM, Lynch, Jim <Jim.Lynch@hdrinc.com> wrote:

- YUBA RIVER DEVELOPMENT PROJECT RELICENSING -

Transmittal of Riparian Habitat Downstream of Englebright Dam Study (Study 6.2) Plan for 30-Day Review Period

- Written Comments due to YCWA by Close of Business on February 13, 2012 -

On September 30, 2011, FERC's Director of Energy Projects issued a Study Determination related to Yuba County Water Agency's (YCWA) relicensing of its Yuba River Development Project, FERC Project 2246. The Determination required, among other things, that YCWA develop and file with FERC by December 29, 2011 (90 days from the date of the Determination) a modified plan for Study 6.2, Riparian Habitat Downstream of Englebright Dam Study (Study). The Determination also required YCWA to consult with the USFWS, NMFS, CDFG and SWRCB regarding at least parts of the Study, providing them 30 days to review the draft Study plan, and include evidence of consultation in YCWA's final plan filed with FERC.

On December 8, 2011, FERC issued a letter that revised the schedule for filing of the final Study with FERC from December 29, 2011 to March 8, 2012 (70 days from the date of the December 8 letter).

1

Attached to this e-mail for your review is a draft Study 6.2, Riparian Habitat Downstream of Englebright Dam Study in Microsoft Word™ format. We would appreciate your written comments on the draft Study plan no later than close of business on February 13, 2012, 30 days from the date of this e-mail.

We will address your written comments in the Study plan that we file with FERC, and attach your written comments to the Study plan we file. We may call you if we have any questions regarding your comments to be sure we understand them or to reconcile differences.

Note that some other studies for which FERC's Determination required YCWA to consult with agencies are in development and we will transmit our draft of those studies to you when they are available.

Let us know if there is anything we can do to facilitate your review.

If you have any questions about this e-mail, please contact Jim Lynch.

Curt Aikens

General Manager

Yuba County Water Agency

530-741-6278 x115

This e-mail sent on behalf of the above party by:

Re: Comments on Study Plan 6.2 Riparian Habitat Below Englebright Dam

To: Jim Lynch, Ken Hogan, and Alan Mitchnik

In the process of reviewing of Study Plan 1.2 (Channel Morphology Downstream of Englebright Dam) which is interconnected with Study Plan 6.2, I came across two issues pertaining to Study Plan 6.2:.

(1) Within Study Plan 6.2, on page 10 in section 5.3.1.3.5 Large Woody Material, the area where LWM will be sampled is defined as "within the active channel". To my knowledge there is not a universal definition of active channel, leaving it unclear where LWM will be sampled. Based on previous discussions, I believe YCWA's intent is to survey any LWM that interacted with any part of the bankfull channel, which would be consistent with the approach NMFS recommends. This definition would be consistent with the approach in Study Plan 1.2, that will use model runs up to 5,000 cfs to investigate what flows interact with various LWM pieces. As such, NMFS recommends YCWA clarify if the approach in Study Plan 6.2 is intended to survey LWM interacting with the bankfull channel; if not, please clarify the definition of "active channel" you intend to apply.

(2) The second issue pertains to the establishment of riparian sites in the Narrows and Englebright Dam Reaches. The current study plan which is being done in response to FERC's September 30, 2011 determination calls for a riparian site in each of these reaches, or for at least conducting a geomorphology evaluation (to be presented to NMFS) pertaining to riparian vegetation in those sites. The pertinent language from the determination is found below (p.28):

> *"NMFS requested that study sites be increased from 8 to 10 in six geomorphic reaches. Specifically, NMFS request that the Englebright dam and Narrows reaches be sampled for riparian conditions."*

NMFS wants to clarify that the first sentence accurately reflects what NMFS was asking for (8 to 10 riparian sample sites in 6 geomorphic reaches), but the intended geomorphic reaches were the 6 alluvial reaches from Timbuctoo Bend downstream to the confluence with Feather River; these were not meant to include the Narrows and Englebright Dam Reaches. NMFS believes the source of the confusion is that NMFS was asking for LWM sample sites within the Narrows and Englebright Dam reaches (part of the Riparian 6.2 Study Plan), and that some of NMFS' comments providing rationale for LWM sample sites were taken as rationale for riparian study sites (which are more or less independent entities for Study Plan 6.2, but note within Study Plan 6.1 the LWM and riparian study site locations are much more aligned). An additional aspect of confusion likely stems from NMFS' approach to LWM, riparian habitat, and channel morphology in its Study Request #4, which did not break the studies into separate entities, upstream and downstream of Englebright Dam, as YCWA did in its study organization. This may have added to the confusion because NMFS did request riparian evaluations in the mixed bedrock-alluvial systems upstream of Englebright Dam.

NMFS apologizes for not catching this earlier, as in previous reviews of the determination NMFS probably improperly transposed LWM sample sites with riparian study sites, or mentally linked them together in a manner similar to how the studies are being done of upstream of Englebright Dam. Furthermore, following the original issuance of the determination, NMFS did not focus on aspects of the determination pertaining to Studies 1.2 and 6.2 (downstream of Englebright Dam) because they were not part of the study dispute and subsequent resolution process. Nonetheless, it was not NMFS' intent to request full-blown riparian study sites in the Narrows and Englebright Dam Reaches. Thus, NMFS believes the current inclusion of riparian sites in those reaches may be because of a misinterpretation of NMFS' study request intent.

Within the current Study Plan 6.2it is unclear whether plans are currently underway to establish riparian sites within the Narrows and Englebright Dam Reaches, or if an earlier, initial step is to prepare the geomorphology evaluation for NMFS, and then make a decision to proceed or not with full-blown riparian sites. While it does seem like useful information for a technical report to include a geomorphology driven analysis to assess the limiting factors (e.g., the bedrock canyon terrain and substrate dominated by boulders and angular "shot-rock") on riparian vegetation within the Narrows and Englebright Dam Reaches, the necessity of this step should probably be weighed based on the added cost to YCWA and whether any additional field work is needed for the analysis.

If YCWA and/or FERC wishes to take steps to modify Study Plan 6.2 accordingly, please let NMFS know if we can help clarify or come to agreement on the tasks that should be completed .

ATTACHMENT 6-2D

YCWA's Reply to Written Comments

Page Left Blank

Flood Control • Water Supply • Fishery Enhancement • Recreation • Hydro Electric Generation

March 8, 2012

Electronically Transmitted

Daniel Welsh
Assistant Field Supervisor
United States Department of the Interior
Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Subject: Yuba River Development Project
FERC Project No. 2246-058
Reply to Comments on YCWA's
Revised Study 6.2, Riparian Habitat Downstream of Englebright Dam

Dear Mr. Welsh:

On September 30, 2011, the Federal Energy Regulatory Commission's (FERC) Director of the Office of Energy Projects (Director) issued a Study Plan Determination (Determination) related to Yuba County Water Agency's (YCWA) relicensing of its Yuba River Development Project, FERC Project 2246.

The Determination required, in part, that YCWA modify its proposed Study 6.2, Riparian Habitat Downstream Of Englebright Dam (Study) and file the modified Study with FERC within 90 days of the date of FERC's letter (i.e., by December 29, 2011), allowing at least 30 days for comment by agencies. The Determination required YCWA include in its filing copies of agency's comments, a discussion of how comments were addressed, and reason for not adopting any agency recommendations.

In its December 8, 2011 Study Plan Modification, FERC directed YCWA to make additional modifications to the Study, and in another letter dated December 8, 2011, FERC amended the deadline to March 8, 2012 for YCWA to file its modified Study.

YCWA modified the Study as directed by the Determination and, on January 8, 2012 provided the draft modified Study for 30-day review and comment to the United States Department of Interior, Fish and Wildlife Service (USFWS); United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); California Department of Fish and Game (CDFG); and State Water Resources Control Board (SWRCB).

1220 F Street • Marysville, CA 95901-4226 • 530.741.6278 • Fax: 530.741.6541
www.ycwa.com

NMFS provided written comments in an email dated February 16, 2012. USFWS did not provide written comments to YCWA, but filed a letter with FERC dated February 16, 2012. That letter included comments on the Study. CDFG and SWRCB did not provide written comments.

Provided below is YCWA's reply to the USFWS's five comments in the draft modified Study. For ease of reference, YCWA has duplicated the comment and then provided its reply indicating whether YCWA has adopted the comment, adopted the comment with modification, or did not adopt the comment.

YCWA files this letters with FERC as part of the revised Study.

COMMENTS AND REPLIES

USFWS-1: *"We already suspect or know anecdotally and from a few cursory surveys that very few cottonwoods (mostly old) occur on the lower Yuba River, and that most of the willows are the shrubby, quick-colonizing species rather than the tree-like species. This study includes the necessary step of documenting the above existing conditions. More critical, however, the study should examine the effects of YCWA actions on cottonwood recruitment in the lower Yuba River. The effects of flow regime on cottonwood recruitment have been effectively studied in the Sacramento River (e.g., Roberts et al. 2002) and some of the same mechanisms may be at work in the lower Yuba River. However, non-flow related characteristics of the lower Yuba River (e.g., lack of fines, lack of sufficient parental stock, etc.) also may be limiting. It is not clear how the second objective of evaluating "trends in riparian health and factors contributing to riparian conditions in the Study Area" will be meaningfully accomplished with this study, as doing so would require parsing the effects of flow, substrate, parental stock, and other factors. The study objectives and methods should be refocused to conduct this sort of limiting factors analysis so Project effects can be identified."* (p. 3 of USFWS's February 16, 2012 letter)

YCWA's Reply: NOT ADOPTED. YCWA believes that the study provides methods adequate for addressing the current conditions of the riparian habitat in the lower Yuba River (Criteria 5). Additionally, USFWS has not provided proposed methods for performing a limiting factors analysis or costs associated with this analysis and YCWA's estimation of the costs far exceeds the benefits provided by a limiting factors analysis (FERC's Study Criteria 7).

USFWS-2: *Will the selected 3-meter level of accuracy meet metadata requirements for use in ESRI Shapefiles and GeoDatabases? Will map grade, survey grade, or recreation grade GPS units be needed? These vary in data quality and need to be selected beforehand. This comment also applies to Section 5.3.1.3.1 (Vegetation Mapping).*

YCWA's Reply: ADOPTED WITH MODIFICATION. YCWA will use either a Map Grade Trimble GPS or a Recreation Grade Garmin GPS for Riparian Vegetation and large woody material (LWM) surveys, depending on satellite availability. Both GPS units provide 3-meter accuracy and will meet metadata requirements for use in ESRI Shapefiles and GeoDatabases.

USFWS-3: *Regarding minimizing the chance of spreading non-native invasive species (8th bullet): It would be useful to develop and implement a Hazard Analysis Critical Control Point (HACCP) Plan which would indicate that zebra mussels fire not a concern relative to this proposed study but that New Zealand mudsnails are a concern.*

YCWA's Reply: ADOPTED WITH MODIFCIATION. YCWA appreciates the USFWS concern for invasive species and is fully dedicated to preventing the spread of any invasive (e.g. New Zealand mud snails *[Potamopyrgus antipodarum])* species in the Project or Project-affected reaches. YCWA does not believe that a HACCP Plan is necessary because protocol requires each field crew member to decontaminate all personal and field equipment before entering a Project affected watershed (refer to Section 5.2, last bullet).

USFWS-4: *Section 5.3.1.1 (Step 1 - Site Selection): The "wetted edge of the river" would be variable depending on water year and existing flow. An explicit methodology for addressing in-channel gravel bars, floodplain and emergent vegetation should be developed, and potential limitations of this protocol should be acknowledged.* (p. 4 of USFWS's February 16, 2012 letter)

YCWA's Reply: ADOPTED. YCWA added wording to the study to include the survey of in-channel gravel bars, floodplain and emergent vegetation that occurs within the study area. For additional clarification, maps have been included (Attachment 6-2A) to indicate the longitudinal and lateral extents of each study site.

USFWS-5: *Section 5.3.1.3.3 (Digital Elevation Model Topographic Map and Hydrodynamic Model): It is unclear what is meant by determining "vegetation types by heights." The usefulness of the existing LiDAR data set (now a few years old) for the lower Yuba River in classifying riparian vegetation types is still unclear. A recent symposium focusing on this data indicated difficulty in identifying species. Accuracy is much better for taller, isolated trees and is worse for smaller shrubby species. Cottonwood, Sycamore, Willow, and Other classes can be distinguished with "fair accuracy." New LiDAR technology is supposed to be much better.* (p. 4 of USFWS's February 16, 2012 letter)

YCWA's Reply: ADOPTED WITH MODIFICATION. YCWA has added wording to clarify what is meant by "vegetation types by heights," which describes tree, shrub, and herbaceous vegetation layers. YCWA will utilize information provided by the LiDAR data set combined with 2009 NAIP imagery and ground-truthed by Watershed Sciences as a part of the Yuba Accord's River Management Team (RMT) efforts to the extent possible. Although LiDAR data will not provide a complete census and location of each plant species occurring within the lower Yuba River corridor, it will provide quantifiable cover information and functional group distribution adequate for the purpose of the Study.

Mr. Welsh
March 8, 2012
Page 4 of 4

If you have any questions regarding this matter, please contact me

Sincerely,
YUBA COUNTY WATER AGENCY

Curt Aikens
General Manager

Flood Control • Water Supply • Fishery Enhancement • Recreation • Hydro Electric Generation

March 8, 2012

Electronically Transmitted

John Wooster
United States Department of Commerce
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Subject: Yuba River Development Project
FERC Project No. 2246-058
Reply to Comments on YCWA's
Revised Study 6.2, Riparian Habitat Downstream Of Englebright Dam

Dear Mr. Wooster:

On September 30, 2011, the Federal Energy Regulatory Commission's (FERC) Director of the Office of Energy Projects (Director) issued a Study Plan Determination (Determination) related to Yuba County Water Agency's (YCWA) relicensing of its Yuba River Development Project, FERC Project 2246.

The Determination required, in part, that YCWA modify its proposed Study 6.1, Riparian Habitat Upstream Of Englebright Reservoir (Study) and file the modified Study with FERC within 90 days of the date of FERC's letter (i.e., by December 29, 2011), allowing at least 30 days for comment by agencies. The Determination required YCWA include in its filing copies of agency's comments, a discussion of how comments were addressed, and reason for not adopting any agency recommendations.

In its December 8, 2011 Study Plan Modification, FERC directed YCWA to make additional modifications to the Study, and in another letter dated December 8, 2011, FERC amended the deadline to March 8, 2012 for YCWA to file its modified Study.

YCWA modified the Study as directed by the Determination and, on January 8, 2012, provided the draft modified Study for 30-day review and comment to the United States Department of Interior, Fish and Wildlife Service (USFWS); United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); California Department of Fish and Game (CDFG); State Water Resources Control Board (SWRCB); and Foothill Water Network (FWN).

1220 F Street • Marysville, CA 95901-4226 • 530.741.6278 • Fax: 530.741.6541
www.ycwa.com

NMFS provided written comments in an email dated February 16, 2012. USFWS did not provide written comments to YCWA, but filed a letter with FERC dated February 16, 2012. That letter included comments on the Study. CDFG and SWRCB did not provide written comments.

Provided below is YCWA's reply to NMFS's three comments regarding the draft modified Study. For ease of reference, YCWA has duplicated the comment and then provided its reply indicating whether YCWA has adopted the comment, adopted the comment with modification, or did not adopt the comment.

YCWA files this letters with FERC as part of the revised Study.

COMMENT AND REPLY

NMFS-1: *Within Study Plan 6.2, on page 10 in section 5.3.1.3.5 Large Woody Material, the area where LWM will be sampled is defined as "within the active channel". To my knowledge there is not a universal definition of active channel, leaving it unclear where LWM will be sampled. Based on previous discussions, I believe YCWA's intent is to survey any LWM that interacted with any part of the bankfull channel, which would be consistent with the approach NMFS recommends. This definition would be consistent with the approach in Study Plan 1.2, that will use model runs up to 5,000 cfs to investigate what flows interact with various LWM pieces. As such, NMFS recommends YCWA clarify if the approach in Study Plan 6.2 is intended to survey LWM interacting with the bankfull channel; if not, please clarify the definition of "active channel" you intend to apply.*

YCWA's Reply: ADOPTED. YCWA added wording to the study to include the bankfull definition suggested by NMFS of 5,000 cfs and to be consistent with the wording in Study Plan 1.2. Additionally, YCWA has included a map (Attachment 6-2A to the study) indicating the reach lengths and widths, using polygons delineated by Wyrick and Pasternack (2011) at bankfull width which has been defined as 5,000 cfs. Study sites located within each reach are also indicated.

NMFS-2: *The second issue pertains to the establishment of riparian sites in the Narrows and Englebright Dam Reaches.... what NMFS was asking for (8 to 10 riparian sample sites in 6 geomorphic reaches), but the intended geomorphic reaches were the 6 alluvial reaches from Timbuctoo Bend downstream to the confluence with Feather River; these were not meant to include the Narrows and Englebright Dam Reaches.*

YCWA's Reply: NOT ADOPTED. YCWA believes that the study sites chosen for each reach will provide adequate information to assess the current conditions of the Riparian Habitat in the Lower Yuba River, including the presence of large woody material (LWM). At the request of NMFS and recommended in FERC's September 30, 2011 Study Plan Determination, YCWA added the Narrows and Englebright Dam reaches.

NMFS-3: *Within the current Study Plan 6.2 it is unclear whether plans are currently underway to establish riparian sites within the Narrows and Englebright Dam Reaches, or if an*

earlier, initial step is to prepare the geomorphology evaluation for NMFS, and then make a decision to proceed or not with full-blown riparian sites.

YCWA's Reply: ADOPTED. YCWA has modified a table to clarify where riparian vegetation and LWM sites will be located and has also added a map to the Study (Attachment 6-2A). Although the bedrock dominated channels of the Englebright and Narrows reaches are likely to support riparian habitat with characteristics different from that occurring in the alluvial reaches of the Lower Yuba River, YCWA intends to assess the current conditions as access allows. The concern regarding assessment in this area is in establishing a stage discharge relationship, as the reach may not be safe (too steep and deep) to perform channel morphology cross sections. YCWA will perform the riparian habitat surveys to the extent that it is safely possible and will consult with NMFS if YCWA cannot perform the methods described in the study, as recommended by FERC in the September 30, 2011 Study Plan Determination.

If you have any questions regarding this matter, please contact me

Sincerely,
YUBA COUNTY WATER AGENCY

Curt Aikens

Curt Aikens
General Manager

Work Cited

Wyrick, J. and G. Pasternack. 2011. Lower Yuba Accord Monitoring and Evaluation Program, Spatial Structure Analysis Interim Report. Prepared for the Lower Yuba River Accord Planning Team.

Page Left Blank

