

7.6 Wetland, Riparian, and Littoral Habitats

7.6.1 Overview

This section discusses wetland, riparian, and littoral habitats in the vicinity¹ of Yuba County Water Agency's (YCWA or Licensee) Yuba River Development Project (Project). This section is divided into four subsections: Section 7.6.1, this overview; Section 7.6.2, wetland, riparian, and littoral habitats of the Project Area²; Section 7.6.3, wetland, riparian, and littoral habitats downstream of the Project Area; and Section 7.6.4 List of Attachments.

7.6.2 Wetlands, Riparian, and Littoral Habitats of the Project Area

Few sources of information are available from which to describe wetland, riparian, and littoral resources in the Project area. As observed previously by Nevada County (1996), Licensee found that United States Department of Interior (USDOI), Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI) maps (USFWS 1987) are the only maps showing the distribution, extent, and types of palustrine wetlands and lacustrine littoral zones. However, NWI maps are based on aerial imagery, are typically not verified by ground surveys, and provide no information on plant species associated with the mapped areas.

Attachment 7.6A, located at the end of this section, contains a map series showing NWI-mapped wetlands, riparian, and littoral habitats within the Project Area. The Project Area encompasses the FERC Project Boundary.³

7.6.2.1 Wetlands

Wetlands are transitional lands that occur between uplands and aquatic systems. However, wetlands also may include certain shallow aquatic areas and are more accurately defined according to the following attributes (Cowardin et al. 1979):

- 1) at least periodically, the land supports predominantly hydrophytes (i.e., vegetation associated with moist soil conditions);
- 2) the substrate is predominantly un-drained hydric soil (i.e., soil characterized by anaerobic conditions); and
- 3) the substrate is non-soil (i.e., boulder, bedrock or similar substrate) and is saturated with water or covered by shallow water at some time during the growing season of each year.

¹ For the purposes of this document, Project Vicinity is defined as the area surrounding the Project on the order of a United States Geological Survey (USGS) 1:24,000 topographic quadrangle.

² For the purposes of this document, the Project Area is defined as the area within the Federal Energy Regulatory Commission (FERC) Project Boundary and the land immediately surrounding the FERC Project Boundary (i.e., within approximately 0.25-mile of the FERC Project Boundary) and includes Project-affected reaches between facilities and downstream to the next major water controlling feature or structure.

³ The existing FERC Project Boundary is defined as the area Licensee uses for normal Project operations and maintenance, and is shown in Exhibits G, J, and K of the current license.

Areas of deep, permanent water are not included under the definition of wetland. Ponds, swamps, marshes, bogs, springs, fens, and wet meadows are examples of wetlands.

All wetlands discussed in this section are categorized as palustrine or riverine by Cowardin et al. (1979). Although nine major classes of palustrine wetlands have been described, only five are mapped by NWI, and three of these are found in the Project Area (Attachment 7.6A). Additionally, four major classes of riverine wetlands have been described and mapped by NWI, and two of these are found in the Project Area. The available data for the Project Area also contained three wetland classes (palustrine open water, riverine flat, and riverine open water) that are now considered obsolete. However, these areas are still potential wetlands, though they have been reclassified under NWI.

The eight NWI wetland classes (both current and obsolete) that may be found in the Project Area are listed below in Table 7.6.2-1. This table also provides the total area encompassed by each of the five current and three obsolete NWI-mapped wetland classes for both the Project Area and within the Project Boundary (Attachment 7.6A). Following the table, more detailed descriptions of the five defined NWI wetland classes are provided, including their known or likely occurrence in the Project Area, based on mapping of wetland types by NWI.

Table 7.6.2-1. NWI palustrine and riverine wetland classes within the Project Area.¹

Type	Definition	Acres/Feet in Project Area	Acres/Feet within FERC Project Boundary
PALUSTRINE EMERGENT (PEM)			
PEMY	Palustrine emergent, saturated/semi-permanent/seasonal	3.69 acres and 935.84 feet	--
PALUSTRINE SCRUB-SHRUB (PSS)			
PSSY	Palustrine scrub-shrub, saturated/semi-permanent/seasonal	13,340 feet	375.28 feet
PALUSTRINE FORESTED (PFO)			
PFO	Palustrine forested	287.58 feet	--
PFOY	Palustrine forested, saturated/semi-permanent/seasonal	49,362.48 feet	7,947.76 feet
PALUSTRINE OPEN WATER (POW)²			
POWKY	Palustrine open water, artificially flooded, saturated/semi-permanent/seasonal	7.50 acres	5.09 acres
POWKZ	Palustrine open water, artificially flooded, intermittently exposed/permanent	2.10 acres	--
RIVERINE UNCONSOLIDATED BOTTOM (RUB)			
R3UBH	Riverine upper perennial, unconsolidated bottom, permanently flooded	10,161.36 feet	4,302.38 feet
RIVERINE STREAMBED (RSB)			
R3SBY	Riverine upper perennial streambed, saturated/semi-permanent/seasonal	609.25 feet and 78.25 acres	50.64 acres
R4SBC	Riverine intermittent streambed, seasonally flooded	443.35 feet	5,408.33 feet
RIVERINE FLAT (RFL)²			
R3FLY	Riverine upper perennial flat, saturated/semi-permanent/seasonal	3.83 acres	1.22 acres
RIVERINE OPEN WATER (ROW)²			
R3OWZ	Riverine upper perennial open water, intermittently exposed/permanent	24,238.35 feet and 43.29 acres	3,298 feet and 2.57 acres

¹ This table does not include the 4,635 acres of open water reservoir habitat that may qualify as jurisdictional wetlands under Section 404 of the federal Clean Water Act.

² Obsolete class and not described further.

Descriptions of the five NWI defined wetland classes found in the Project Area follow.

7.6.2.1.1 Palustrine Emergent (PEM)

Palustrine emergent wetlands are defined by rooted herbaceous species growing in relatively shallow water or saturated soil (Cowardin et al. 1979); the term “emergent” is a reference to plants that emerge above the water surface in contrast to submerged aquatic plants. Examples of PEM wetlands are meadows, marshes, fens, and bogs. Comparable categories in the CWHR classification system are Fresh Emergent Wetland and Wet Meadow. Given the variety of habitats that meet the definition of the emergent wetland class, further description requires information on hydrology, morphology, topographic setting, and plant species composition. PEM wetlands occupy approximately 3.69 acres and 935 linear feet in the Project Area (Table 7.6.2-1). There are no PEM wetlands mapped within the FERC Project Boundary. One type of NWI-mapped PEM wetland occurs in the Project Vicinity, near the Our House Diversion Dam, but downstream of the FERC Project Boundary.

7.6.2.1.2 Palustrine Scrub-Shrub (PSS)

Palustrine scrub-shrub wetlands are dominated by hydrophytic shrubs, small trees, or a combination of these, growing in temporarily (or rarely permanently) flooded, shallow water; by definition, dominant vegetation is less than 18 feet tall. One type of PSS wetland occupies approximately 13,340 linear feet within the Project Area and 375 linear feet within the FERC Project Boundary (Table 7.6.2-1), upstream of the Log Cabin Diversion Dam, both in and out of the FERC Boundary.

7.6.2.1.3 Palustrine Forested (PFO)

Palustrine forested wetlands are dominated by hydrophytic trees 18 feet tall or greater, often with other shrub and emergent wetland communities in or adjacent to seasonally shallow water. Two types of PFO wetlands occupy approximately 49,650 linear feet, combined, within the Project Area and 7,947 linear feet, combined, within the FERC Project Boundary (Table 7.6.2-1) and potentially also occur in rivers and streams upstream of New Bullards Bar Reservoir.

7.6.2.1.4 Riverine Unconsolidated Bottom (RUB)

Riverine unconsolidated bottom wetlands are characterized by 25 percent or more exposed sand, gravel, or small stones, and 30 percent or less vegetative cover (Cowardin et al. 1979). NWI mapped RUB wetlands occupy approximately 10,160 linear feet in the Project Area and 4,300 linear feet in the FERC Project Boundary (Table 7.6.2-1), and occur at two locations: 1) upstream and downstream of Our House Diversion Dam, and 2) near New Colgate Powerhouse, downstream of the Project, both inside and outside the FERC Project Boundary.

7.6.2.1.5 Riverine Streambed (RSB)

Riverine streambed includes wetlands that are completely dewatered at low flow. Most streambeds are not vegetated, but pioneering species may colonize during periods of low flow

(Cowardin et al. 1979). NWI mapped RSB wetlands occupy approximately 50.64 acres and 5,408 linear feet within the FERC Project Boundary (Table 7.6.2-1) upstream from New Bullards Bar Reservoir.

7.6.2.2 Riparian Habitat

The term “riparian” applies to the vegetation and other biological resources “...contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic [rivers, streams, or drainage ways] and lentic [lakes] water bodies...” (USFWS 1997). Although the term has traditionally been applied only to lotic systems, in the western United States “riparian” is also used to describe the distinctive vegetation associated with the moister conditions around lentic reservoirs. Wetlands and riparian areas may overlap (such as in riparian wetlands), but not all riparian areas are wetlands and not all wetlands are riparian areas.

The Project spans two CalVeg zones: the Northern Sierra Zone and the Central Valley Zone. Using CalVeg, Licensee identified the riparian habitats in the Project Area as White Alder Alliance, Valley Oak Alliance, and Willow Alliance (UDSA-FS 2004). A discussion of each riparian habitat is provided below.

7.6.2.2.1 White Alder Alliance

White alder (*Alnus rhombifolia*) occurs in pure or mixed stands along rivers and streams throughout much of the state. It is sometimes found in proximity to upland conifers such as Douglas-fir, ponderosa pine, and white fir. This Alliance is generally found below 5,400 feet, and may contain a variety of riparian or shade tolerant species such as Pacific yew (*Taxus brevifolia*), California hazelnut (*Corylus cornuta* ssp. *californica*), Fremont cottonwood (*Populus fremontii*), elk clover (*Aralia californica*), crimson columbine (*Aquilegia formosa*), and cardinal monkeyflower (*Mimulus cardinalis*). This alliance makes up 0.02 percent of the total Project Area, and covers 11.19 acres in the Northern Sierra Zone, along Oregon Creek below Log Cabin Diversion Dam. This occurrence is outside the FERC Project Boundary.

7.6.2.2.2 Valley Oak Alliance

This riparian Alliance is dominated by valley oak. This declining species formerly occurred in pure stands of large trees with no woody understory. These stands occurred on valley bottoms and rolling slopes. Today, valley oaks are typically found along major stream courses and on the deep, rich loamy soils of alluvial deposits in areas in and adjacent to the Central Valley Ecological Province. These trees generally grow below 2,000 feet elevation in the north. This Alliance makes up 0.17 percent of the total Project Area with 86.63 acres in the Central Valley Zone. This alliance occurs in three patches above New Colgate Powerhouse, outside the FERC Project Boundary.

7.6.2.2.3 Willow Alliance

The Willow Alliance is a wide-ranging, diverse type found on both western and eastern Sierran slopes. Species of willows dominate the hardwood mixture. The Alliance generally occurs in

pure stands along streams and moist canyon bottoms. Trees such as quaking aspen (*Populus tremuloides*), white alder, mountain alder (*Alnus incana* ssp. *tenuifolia*), Fremont cottonwood, and black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), as well as several shrub species, may be associated with the Willow Alliance in minor amounts, often forming mixed types of riparian hardwoods. The Willow Alliance makes up 0.02 percent of the total Project Area, with 7.11 acres in the Northern Sierra Zone. These acres are located in one small occurrence on a tributary stream off of upper middle New Bullards Bar Reservoir and outside the FERC Project Boundary.

7.6.2.3 Littoral Habitat

In lacustrine, or lake, systems, the littoral habitat corresponds to the shallow water area beginning at the lowest depth at which rooted aquatic plants can occur, regardless of whether plants are present. Cowardin et al. (1979) describes the littoral zone as the wetland habitats which extend to a depth of 6.6 feet below the low water line. Submerged bars, beaches, and flats are examples of littoral habitats. On reservoirs with a pronounced seasonal drawdown, the seasonally exposed shallows may be classified as “...*littoral unconsolidated shore, seasonally flooded, impounded (L2USCh)*.” Emergent wetlands along the shallow edges of lakes are technically littoral, but are classified in the NWI system as palustrine.

Licensee found no relevant and reasonably available descriptions of littoral habitat in the Project Area.

7.6.3 Wetlands, Riparian, and Littoral Habitats Downstream of the Project Area

The Yuba River below USACE’s Englebright Dam extends approximately 24 miles from Englebright Dam to its confluence with the Feather River (YCWA 2003a). Where hydrologic conditions are supportive, riparian and wetland vegetative communities are found adjacent to the lower Yuba River and on the river-side of the retaining levees. These communities are dynamic and have changed over time as the river has meandered. The plant communities along the river are a combination of remnant Central Valley riparian forests and woodlands, foothill oak/pine woodlands, agricultural grasslands, and orchards (CDFG 1989).

Since completion of New Bullards Bar Reservoir, the riparian community has expanded under stream flow conditions that have generally been higher than those initially required (SWRCB 2003). However, the riparian habitat is not pristine. In its “Final Biological and Conference Opinion for the Yuba River Development Project License Amendment (FERC No. 2246), NMFS (2005) reports on Page 36:

The deposition of hydraulic mining debris, subsequent dredge mining, and loss/confinement of the active river corridor and floodplain of the lower Yuba River which started in the mid-1800’s and continues to a lesser extent today, has eliminated much of the riparian vegetation along the lower Yuba River. In addition, the large quantities of cobble and gravel that remained generally

provided poor conditions for re-establishment and growth of riparian vegetation. Construction of Englebright Dam also inhibited regeneration of riparian vegetation by preventing the transport of any new fine sediment, woody debris, and nutrients from upstream sources to the lower river. Subsequently, mature riparian vegetation is sparse and intermittent along the lower Yuba River, leaving much of the bank areas unshaded and lacking in large woody debris. This loss of riparian cover has greatly diminished the value of the habitat in this area.

The Yuba Accord River Management Team (RMT), a multi agency working group tasked with evaluating flows in the Yuba River below Englebright Dam is developing a vegetation map of the lower Yuba River downstream of the Highway 20 bridge using the results of a LIDAR airborne mapping survey in autumn 2008. For the reaches upstream of that, the RMT will perform image classification on 2009 NAIP digital color imagery. Ground-based verification of the image classification is planned for 2010 and 2011. These efforts are expected to be complete by December 2011.

Other studies under way for the lower Yuba River below Englebright Dam included historic analysis of aerial photography that should serve to characterize education community and progression. This work will be funded by the YCWA, with input from the RMT.

Reach-by-reach descriptions also provide insights into the lower Yuba River's riparian communities.

7.6.3.1 Narrows Reach

The Narrows Reach extends from Englebright Dam about 2 miles downstream to the mouth of the Narrows Canyon (NMFS 2005). In this reach, the channel is steep and consists of a series of rapids and deep pools confined by a bedrock canyon. YCWA (2003b) described the area in the "Narrows II Powerplant Flow Bypass System Initial Study" as follows:

Small isolated clumps of willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), and other riparian species are widely scattered along the otherwise barren, rocky banks of the Yuba River downstream of the Narrows 2 Powerplant and along the shoreline of Englebright Reservoir. Wildlife species expected along the Yuba River include black phoebe (*Sayornis nigricans*), belted kingfisher (*Ceryle alcyon*), and waterfowl, such as common merganser (*Mergus merganser*). Blue oak-foothill pine habitat is common on the hillsides that surround the project site. Wildlife species common to the Sierra Nevada foothills include mule deer (*Odocoileus hemionus*), western fence lizard (*Sceloporus occidentalis*), and mourning dove (*Zenaida macroura*).

Deer Creek enters the Yuba River in this reach at RM 23. Freshwater emergent wetlands are often found at stream confluences, which also tend to have high species diversity.

7.6.3.2 Garcia Gravel Pit Reach

Downstream of the Narrows reach, the channel enters the alluvial valley plain where massive quantities of hydraulic mining debris remain from past gold mining operations (NMFS 2005). Whereas CDFG (1989) observed that the dominant linear feature of the Garcia Gravel Pit Reach was blue oak/gray pine woodland (35 percent), and riparian vegetation (44 percent), NMFS (2005) observed more shaded riverine habitat in the Garcia Gravel Pit Reach than in the Daguerre Point Reach, suggesting that conditions for this reach may have improved between 1989 and 2005. Dry Creek enters the Yuba River in this reach at RM 14.

7.6.3.3 Daguerre Point Reach

Like the Garcia Gravel Pit Reach, the Daguerre Point Reach also is dominated by mining debris. (CDFG 1989) observed that riparian vegetation was the dominant streamside feature (72 percent) of the Daguerre Point Reach. A recent reconnaissance-level survey conducted on October 16, 2006 indicated that the riparian habitat within the Daguerre Point Reach consists of shrubby willow species including, arroyo willow (*Salix lasiolepis*), sandbar willow (*Salix exigua*), and shining willow (*Salix lucida*) interspersed with Fremont's cottonwoods. Additionally, the flows at which the survey was conducted (approximately 550 cfs at Marysville) revealed that relatively large stage changes would be required to inundate substantial amounts of riparian habitat. Inundated wetland habitat was not observed during the reconnaissance survey.

7.6.3.4 Simpson Lane Reach

The Simpson Lane Reach is subject to backwater influences of the Feather River (NMFS 2005). CDFG (1989) observed that that riparian vegetation was the dominant streamside feature (78 percent) of the Simpson Lane Reach, while the EWA EIS/EIR observed grassland, agricultural fields, as wells as barren land (Reclamation *et al.* 2003).

7.6.4 List of Attachments

This section includes one attachment:

- Attachment 7.6A: NWI Maps

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Section 7.6

Wetlands, Riparian, and Littoral Habitat Attachment

- **Attachment 7.6A: NWI Maps**

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