7.6 Wetlands, Riparian and Littoral Habitats

7.6.1 Overview

This section discusses wetland, riparian and littoral habitats in the vicinity[1] of Yuba County Water Agency's (YCWA or Licensee) Yuba River Development Project (Project). Besides this introductory information, this section is divided into three subsections: Section 7.6.2 discusses wetlands; Section 7.6.3 discusses riparian habitat; and Section 7.6.4 discusses littoral habitat. Unlike Sections 7.2 through 7.5, which include descriptions of resources upstream of the Project, in the Project Area,[2] and downstream of the Project, this section focuses primarily on the Project Area.

Few sources of information are known to be available from which to describe existing and relevant wetland, riparian, and littoral resources. United States Department of Interior (USDOI) Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps (USFWS 1987) are the only known maps showing the distribution and extent, and types of palustrine wetlands and lacustrine littoral zones. However, NWI maps are based on aerial imagery, typically not verified by ground surveys, and provide no information on plant species associated with mapped areas.

7.6.2 Wetlands

Wetlands are commonly understood to be transitional lands that occur between uplands and aquatic systems. However, wetlands also 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.* soils characterized by anaerobic conditions]; and
3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

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 (Cowardin *et al.* 1979). Nine major classes of palustrine wetlands have been described; five are mapped by NWI, and three of these are found in the Project Area. Additionally, four major classes of riverine

[1] For the purposes of this document, the 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.

wetlands have been described and mapped by NWI; two of these are found in the Project Area. The available data for the Project Area also contained three wetland classes (*i.e.*, palustrine open water, riverine flat and riverine open water) that are now considered obsolete and are not described below. However, these areas are still potential wetlands, though classified as a different NWI wetland class, and thus, need mention.

The five wetland types are described in this section, including their known or likely occurrence in the Project Area and in the Federal Energy Regulatory Commission (FERC) Project Boundary,[3] based on mapping of wetland types by NWI for Project reservoirs. The total area encompassed by each of the five NWI-mapped wetland types surrounding Project reservoirs is reported in Table 7.6.2-1. Attachment 7.6A, located at the end of this section, contains a map series showing NWI-mapped palustrine and riverine wetland occurrences, as well as NWI-mapped littoral habitat.

Table 7.6.2-1. Definitions and general patterns of occurrence of NWI palustrine and riverine wetland types and littoral habitats within the Project Area and within the FERC Project Boundary.[a]

Type	Definition	Acres/Feet in Project Area	Acres/Feet in FERC Project Boundary
PALUSTRINE EMERGENT (PEM)			
PEMY	Palustrine emergent, saturated/semi-permanent/seasonal	935.84 feet and 3.69 acres	----
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)			
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)			
R3FLY	Riverine upper perennial flat, saturated/semi-permanent/seasonal	3.83 acres	1.22 acres
RIVERINE OPEN WATER (ROW)			
R3OWZ	Riverine upper perennial open water intermittently exposed/permanent	24,238.35 feet and 43.29 acres	3,298 feet and 2.57 acres

[a] 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.

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

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 in the FERC Project Boundary. PEM wetlands occur near the Our House Diversion Dam, but outside the FERC Project Boundary.

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

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

Riverine Unconsolidated Bottom (RUB)
Riverine unconsolidated bottom wetlands are characterized by at least 25 percent cover of particles smaller than stones and vegetation cover less than 30 percent (Cowardin *et al.* 1979). 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 along Our House Diversion Dam and near New Colgate Powerhouse, both inside and outside the FERC Project Boundary.

Riverine Streambed (RSB)
Riverine streambed included 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). RSB wetlands occupy approximately 50.64 acres and 5,408 linear feet in the FERC Project Boundary, (Table 7.6.2-1), and occur at the upper end of New Bullards Bar Reservoir.

7.6.3 Riparian Habitat

Riparian applies to the vegetation zone and other biological resources *"…contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic (lakes)*

and lentic (rivers, streams, or drainage ways) water bodies." (USFWS 1997a). Although traditionally 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 lakes. Wetlands may occur within riparian areas (*i.e.*, riparian wetlands), but are differentiated on the basis of wetter conditions and related criteria.

Licensee identified the riparian habitats in the Project Area, using CalVeg, as White Alder Alliance, Valley Oak Alliance, and Willow Alliance (UDSA-FS 2004). A discussion of each riparian habitat is provided below.

White Alder Alliance
The White Alder (*Alnus rhombifolia*) Alliance occurs in pure or mixed stands along rivers and streams throughout much of the State. This alliance is generally found below 5,400 feet in association with a variety of riparian or shade tolerant species such as Pacific Yew (*Taxus brevifolia*), California Hazelnut (*Corylus cornuta* var. *californica*), Fremont Cottonwood (*Populus fremontii*), Elk Clover (*Aralia californica*), Columbine (*Aquilegia formosa*), and Monkeyflower (*Mimulus cardinalis*). This alliance makes up 0.1 percent of the total area with 11.19 acres in the Northern Sierra Zone, along Oregon Creek, below Log Cabin Diversion Dam. This occurrence is outside the FERC Project Boundary.

Valley Oak Alliance
The riparian Valley Oak Alliance occurs along major stream courses and on the deep, rich loamy soils of their alluvial deposits in areas within and along the eastern and western fringes of the Central Valley Ecological Province. This Alliance makes up 0.2 percent of the total area with 86.63 acres in the Central Valley Zone, which occur in three patches above New Colgate Powerhouse, outside the FERC Project Boundary.

Willow Alliance
The Willow Alliance is a wide-ranging diverse type on both western and eastern Sierran slopes. Species of treelike Willows (*Salix* spp.) dominate the hardwood mixture. It occurs in pure stands along streams and moist canyon bottoms as a hardwood alliance as well as a minor understory hardwood in almost all conifer alliances within those areas. Hardwoods and shrubs such as Quaking Aspen (*Populus tremuloides*), White Alder, Mountain Alder (*Alnus incana* ssp. *tenuifolia*), Fremont Cottonwood, and Black Cottonwood (*Populus balsamifera* ssp. *trichocarpa*) may be associated with the Willow Alliance in minor amounts, often forming mixed types of riparian hardwoods. The Willow Alliance makes up 0.01 percent of the total area, with 7.11 acres in the Northern Sierra Zone. These acres are located in one small occurrence off of upper middle New Bullards Bar Reservoir and outside the FERC Project Boundary.

7.6.4 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 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 existing, relevant, and reasonably available descriptions of littoral habitat in the Project Area.

7.6.5 List of Attachments

This section includes one attachment:

- Attachment 7.6A: NWI Maps (Adobe Portable Document Format)

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