7.5 Botanical Resources

7.5.1 Overview

This section discusses botanical resources in the vicinity[1] of Yuba County Water Agency's (YCWA or Licensee) Yuba River Development Project (Project) with a focus on special-status[2] species. This section is divided into three subsections: Section 7.5.2 discusses special-status plant species in the Project Area;[3] Section 7.5.3 provides information regarding noxious weeds in the Project Vicinity; and Section 7.5.4 describes existing, relevant and reasonably available information regarding botanical resources in areas upstream of the Project (*i.e.*, on the Middle Yuba River upstream of Our House Diversion Dam, on Oregon Creek upstream of Log Cabin Diversion Dam, and on the North Yuba River upstream of New Bullards Bar Reservoir); within the Project Area; and downstream of the Project (*i.e.*, on the Yuba River downstream of the United States Army Corps of Engineer's (USACE) Daguerre Point Dam).

Wetland, riparian, and littoral habitats are discussed separately in Section 7.6.

7.5.2 Special-Status Plants

For the purpose of the Preliminary Information Package, a special-status botanical species is referred to as a species that has a reasonable possibility of occurring in the Project Area and meets one or more of the following criterion:

- Found on National Forest System (NFS) land managed by the United States Department of Agriculture (USDA) Forest Service (Forest Service) and formally listed in the Forest Service's list of Forest Sensitive Species for the Plumas National Forest (FSS-P) or the Tahoe National Forest (FSS-T) (USDA-FS 2006).
- Found on public land administered by the United States Department of Interior (USDOI) Bureau of Land Management (BLM), and formally listed as Sensitive (BLM-S) in BLM's 2004 *California-BLM Sensitive Plant List* (BLM 2004).
- Found on the California Department of Fish and Game's (CDFG) list of California Rare (SR) species listed under the Native Species Plant Protection Act of 1977 (CDFG 2009b).
- Found on the list of plants afforded protection under the federal Endangered Species Act (ESA) that occur in the Project Area which includes the United States Geological Survey (USGS) 1:24,000 topographic quadrangles Strawberry Valley (574D, 1994), Clipper Mills (574C, 1994), Challenge (558B, 1995), Camptonville (558A, 1995), Pike (557B, 1975),

[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] Refer to Section 7.5.2 for a definition of special-status botanical species as used in this Preliminary Information Package.

[3] 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.

French Corral (558C, 1995), Oregon House (559D, 1995), and Smartville[4] (543A, 1995) (USFWS 2009). Plants on the list that are considered special-status for the purpose of the Relicensing are those species that are proposed for listing as endangered or threatened under the ESA (FPE and FPT, respectively), a candidate for listing under the ESA (FC), or proposed for delisting from the ESA (FPD).[5]

- Found on CDFG's list of Proposed (SP) or Candidate (SC) species for listing as endangered or threatened under the California Endangered Species Act (CESA) (CDFG 2009b).[6]
- Found on California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Plants* (CNPS 1A/1B-4) (CNPS 2009).

Known and potentially occurring special-status plants in the Project Vicinity are described below based on the results of queries to the California Natural Diversity Database (CNDDB) (CDFG 2009a), the USDOI's Fish and Wildlife Service (USFWS) Endangered Species Program, and the CNPS Inventory of Rare and Endangered Plants database (CNPS 2009). CNPS database queries included all USGS 1:24,000 topographic quadrangles on which Project facilities and features occur, as well as a surrounding perimeter approximately one quadrangle wide.

Table 7.5.2-1 lists the 34 special-status plants known to occur or with the potential to occur in the Project Vicinity. The majority (22, or 65% of the total) of these plants are listed by multiple sources. Fifteen plants (44%) are listed as FSS-P, FFS-T, or both, and seven plants (21%) are listed as BLM-S.

Table 7.5.2-1. Special-status plants potentially found within the Project Vicinity.

Common Name/ Scientific Name	Status[1]	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity[2]
Henderson's bent grass *Agrostis hendersonii*	CNPS 3	Apr-Jun	230-1,000	Valley and foothill grasslands, vernal pools	Unknown in project vicinity, present in Brush Creek
Constance's rock Cress *Arabis constancei*	FSS-P CNPS 1B	May-Jul	3,200-6,644	Chaparral, lower and upper montane coniferous forest	Unknown in project vicinity, present in Quads La Porte, Spring Garden, Quincy, Onion Valley, Meadow Valley, Bucks Lake, Dogwood Peak
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	FSS-P BLM-S CNPS 1B	Mar-Jun	295-4,593	Chaparral, Cismontane woodland, and valley and foothill grassland (sometimes serpentine)	Unknown in project vicinity, present in Pilot Hill, Lincoln, Roseville, Brush Creek
Western goblin *Botrychium montanum*	FSS-P FSS-T CNPS 2	Jul-Sep	4,921-6,988	Upper and lower montane coniferous forest, meadows and seeps	Unknown in project vicinity, present in La Porte
Bolander's brachia *Bruchia bolanderi*	FSS-P FSS-T CNPS 2		5,577-9,186	Upper and lower montane coniferous forest, meadows and seeps	Unknown in project vicinity, present in Fillmore, American House, Onion Valley, Meadow Valley, Dogwood Peak.
Stebbins' morning-glory *Calystegia stebbinsii*	FE SE CNPS 1B	Apr-Jul	607-2,395	Chaparral, Cismontane woodland	Unknown in project vicinity, present in Pilot Hill, Grass Valley, Lake Combie

[4] In 2008, the people of this community petitioned to have the name changed to Smartsville, with an 's'. However, the USGS gage refers to the former spelling of the community name. Therefore in this document, the community is referred to as such.

[5] Botanical species that are on the list as threatened (FT) or endangered (FE) under the ESA are not considered special-status for the purpose of the Relicensing proceeding, but are discussed separately in Section 7.7 of the Preliminary Information Package.

[6] Botanical species that are on the list as state threatened (ST) or endangered (SE) under the CESA are not considered special-status for the purpose of the Relicensing proceeding, but are discussed separately in Section 7.7 of the Preliminary Information Package.

Table 7.5.2-1. (continued)

Common Name/ Scientific Name	Status[1]	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity[2]
Dissected-leaved toothwort *Cardamine pachystigma* var. *dissectifolia*	CNPS 3	Feb-May	837-6,890	Chaparral, lower montane coniferous forest	Unknown in project vicinity, present in Cascade , Brush Creek, Berry Creek, Oroville Dam, Forbestown, Pulga
Brandegee's clarkia *Clarkia biloba* ssp. *brandegeeae*	FSS-P FSS-T BLM-S CNPS 1B	May-Jul	240-3,002	Chaparral, Cismontane woodland/often roadcuts	**In vicinity-Pike, Camptonville, Challenge, French Corral, Nevada City** Around vicinity-Auburn, Gold Hill, Rocklin, Pilot Hill, Michigan Bluff, Dutch Flat, Chicago Park, Colfax, Foresthill, Grass Valley, Rough and Ready, Wolf, Lake Combie, Camp Far West, North Bloomfield, Bangor, Oregon House, Oroville Dam, Forbestown
White-stemmed clarkia *Clarkia gracilis* ssp. *albicaulis*	FSS-P BLM-S CNPS 1B	May-Jul	804-3,560	Chaparral, Cismontane woodland/sometimes serpentine	Unknown in project vicinity, present in Berry Creek, Forbestown,
Mildred's clarkia *Clarkia mildrediae* ssp. *mildrediae*	FSS-P BLM-S CNPS 1B	May-Aug	804-5,610	Cismontane woodland, lower montane coniferous forest/sandy, usually granitic	Unknown in project vicinity, present in Brush Creek, Berry Creek, Storrie, Kimshew Point, Pulga
Mosquin's clarkia *Clarkia mosquinii*	FSS-P BLM-S CNPS 1B	May-Jul	607-4,000	Cismontane woodland, lower montane coniferous forest/rocky, roadsides	**In vicinity-Clipper Mills, Strawberry Valley** Around vicinity-Cascade, Brush Creek, Berry Creek, Oroville Dam, Forbestown, Pulga, Soapstone Hill
Northern yellow lady's-slipper *Cypripedium parviflorum* var. *makasin*	CNPS 3	May-Aug	0-4,921	Bogs and fens, meadows and seeps	**In vicinity-Strawberry Valley**
Norris' beard moss *Didymodon norrisii*	CNPS 2		1,969-6,473	Cismontane woodland, lower montane coniferous forest	**In vicinity-Nevada City** Around Vicinity-La Porte
Dwarf downingia *Downingia pusilla*	CNPS 2	Mar-May	3-1,460	Valley and foothill grassland, vernal pools	Around vicinity-Lincoln, Sheridan, Pleasant Grove, Roseville, Browns Valley,
Clifton's eremogone *Eremogone cliftonii*	CNPS 1B	Apr-Sep	1,493-5,807	Chaparral, lower and upper montane coniferous forest/openings, usually granitic	Unknown in project vicinity, present in Cascade, Brush Creek, Onion Valley, Bucks Lake, Storrie, Kimshew Point, Pulga, Soapstone Hill
Minute pocket moss *Fissidens pauperculus*	FSS-P CNPS 1B		33-3,360	Not well known	Unknown in project vicinity, present in Cascade, Brush Creek, Forbestown
Pine Hill flannelbush *Fremontodendron decumbens*	FE SR CNPS 1B	Apr-Jul	1,394-2,493	Chaparral, Cismontane woodland/gabbroic or serpentinite, rocky	Unknown in project vicinity, present in Grass Valley
Butte County fritillary *Fritillaria eastwoodiae*	FSS-P FSS-T CNPS 3	Mar-Jun	164-4,921	Chaparral, Cismontane woodland, lower montane coniferous forest/sometimes serpentinite	**In vicinity-Challenge, French Corral, Nevada City, Clipper Mills** Around vicinity- Auburn, Foresthill, North Bloomfield, Washington, Rackerby, Cascade, Brush Creek, Berry Creek, Oroville Dam, Forbestown, Kimshew Point, Pulga, Soapstone Hill

Table 7.5.2-1. (continued)

Common Name/ Scientific Name	Status[1]	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity[2]
Ahart's dwarf rush *Juncus leiospermus* var. *ahartii*	CNPS 1B	Mar-May	98-751	Valley and foothill grassland	Unknown in project vicinity, present in Lincoln, Loma Rice, Palermo, Biggs, Honcut
Dubious pea *Lathyrus sulphureus* var. *argillaceus*	CNPS 3	Apr-May	492-1,001	Cismontane woodland, Upper and lower montane coniferous forest	Unknown in project vicinity, present in Auburn, Pilot Hill, Rough and Ready, Wolf, Lake Combie
Legenere *Legenere limosa*	BLM-S CNPS 1B	Apr-Jun	3-2,887	Vernal pools	Unknown in project vicinity, present in Roseville, Browns Valley
Cantelow's lewisia *Lewisia cantelovii*	FSS-P FSS-T BLM-S CNPS 1B	May-Oct	1,083-4,495	Broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest/mesic, granitic, sometimes serpentinite seeps	**In vicinity-Pike, French Corral, Nevada City, Strawberry Valley** Around vicinity-Alleghany, North Bloomfield, Washington, Goodyears Bar, Downieville, Brush Creek, Onion Valley, Dogwood Peak, Storrie, Pulga, Soapstone Hill,
Hutchison's lewisia *Lewisia kelloggii* ssp. *hutchisonii*	FSS-P FSS-S CNPS 3	Jun-Aug	4,800-7,759	Upper montane coniferous forest (openings, slate)	Unknown in project vicinity, present in Alleghany, Sierra City, Mount Fillmore, American House, Blue Nose Mountain,
Inundated bog club-moss *Lycopodiella inundata*	CNPS 2	Jun-Sept	16-3,281	Bogs and fens, lower montane coniferous forest, marshes and swamps	Unknown in project vicinity, present in North Bloomfield
Elongate copper moss *Mielichhoferia elongata*	FSS-P FSS-T CNPS 2		1,640-4,265	Cismontane woodland (metamorphic, rock, usually vernally mesic)	**In vicinity-Nevada City** Around vicinity-Dutch Flat, Washington
Follett's monardella *Monardella follettii*	FSS-P FSS-T CNPS 1B	Jun-Sep	1,969-6,562	Lower montane coniferous forest (rocky, serpentinite)	Unknown in project vicinity, present in Grass Valley, Quincy, Onion Valley, Meadow Valley, Bucks Lake
Layne's ragwort *Packera layneae*	FT SR CNPS 1B	Apr-Aug	656-3,281	Chaparral, cismontane woodland/serpentinite or gabbroic, rocky	**In vicinity-Challenge, Clipper Mills** Around vicinity-Pilot Hill, Rackerby
Cedar Crest popcorn-flower *Plagiobothrys glyptocarpus* var. *modestus*	CNPS 3	Apr-Jun	2,854	Cismontane woodland, valley and foothill grassland	Unknown in project vicinity, present in Grass Valley, Oregon House
Green –flowered wintergreen *Pyrola chloantha*	CNPS 1A	Jun-Jul	2,953	Lower montane coniferous forest	Unknown in project vicinity, present in Downieville
Sticky pyrrocoma *Pyrrocoma lucida*	FSS-P FSS-T CNPS 1B	Jul-Oct	2,297-6,398	Great Basin scrub, lower montane coniferous forest, meadows and seeps/alkaline clay	**In vicinity-Camptonville** Around vicinity-Clio, Quincy
Brownish beaked-rush *Rhynchospora capitellata*	CNPS 2	Jul-Aug	1,493-6,562	Upper and lower montane coniferous forest, meadows and seeps, marshes and swamps	**In vicinity-Pike, Nevada City, Clipper Mills** Around vicinity-Chicago Park, Grass Valley, North Bloomfield, Cascade, Brush Creek, Kimshew Point, Pulga
Scadden Flat checkerbloom *Sidalcea stipularis*	SE CNPS 1B	Jul-Aug	2,297-2,395	Marshes and swamps (montane freshwater)	Unknown in project vicinity, present in Chicago Park, Grass Valley
Cylindrical trichodon *Trichodon cylindricus*	CNPS 2		164-6,568	Broadleaf upland forest, meadows and seeps, upper montane coniferous forest/sandy, exposed soil, roadbanks	

Table 7.5.2-1. (continued)

Common Name/ Scientific Name	Status[1]	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity[2]
Siskiyou Mountains huckleberry *Vaccinium coccineum*	CNPS 3	Jun-Aug	3,593-7,005	Upper and lower montane coniferous forest/often serpentinite	**In vicinity-Clipper Mills, Strawberry Valley** Around vicinity-Sierra City, La Porte, American House, Cascade, Quincy, Blue Nose Mountain, Meadow Valley, Bucks Lake, Haskins Valley, Dogwood Peak, Soapstone Hill

[1] Special-status:
BLM-S: Bureau of Land Management Sensitive Plants
FE: Federal Endangered Species
FT: Federal Threatened Species
SR: California Rare Species
ST: California Threatened Species
SE: California Endangered Species
CNPS: California Native Plant Society listed species
1A: Species presumed extinct in California
1B: Species considered rare or endangered in California and elsewhere (no legal protection)
2: Species considered rare or endangered in California but more common elsewhere (no legal protection)
3: More information needed about this species
4: Limited distribution; watch list
CNDDB-S: California Natural Diversity Database listed species
FSS: Forest Service Sensitive (FSS-P-Plumas National Forest; FSS-T-Tahoe National Forest)

[2] Occurrence in Project Vicinity: Some of the USGS topographic quadrangles are found entirely within the Project Vicinity and some are partially within the Project Vicinity. Results based on CNPS nine-quadrangle search.

7.5.3 Noxious Weeds and Other Invasive Plants

For the purpose of the Preliminary Information Package, noxious weeds are defined as those plant species listed as such by the California Department of Food and Agriculture (CDFA). State-designated noxious weeds are typically assigned one of three ratings: 1) A-list species are mandated for eradication or control; 2) B-list species are widespread plants that Agricultural Commissioners can nevertheless designate for local control efforts; and 3) C-listed species are considered too widespread for funding of control efforts (CDFA 2007).

Known and potential noxious weed occurrences are listed in Table 7.5.3-1 (USDA-NRCS 2009, Cal-IPC 2006). A total of 24 noxious weeds are known to occur or have the potential to occur within the Project Vicinity.

Table 7.5.3-1. Noxious weeds and other invasive species known to occur or potentially occurring in the Project Vicinity.

Common Name/ Scientific Name	Status	Flowering Period	Elevation(ft)	Habitat
Russian knapweed *Acroptilon repens*	B	May-Sept	Below 6,200	Fields, roadsides, cultivated ground, disturbed areas
Barb goatgrass *Aegilops triuncialis*	B	May-Aug	Below 3,300	Disturbed sites, cultivated fields, roadsides
Plumeless thistle *Carduus acanthoides*	A	May-Aug	Below 4,300	Roadsides, pastures, waste areas
Musk thistle *Carduus nutans*	A	Jun-Jul	330-4,000	Roadsides, pastures, waste areas
Italian thistle *Carduus pycnocephalus*	C	May-Jul	Below 3,300	Roadsides, pastures, waste areas
Woolly distaff thistle *Carthamus lanatus*	B	July-Aug	Below 3,600	Disturbed sites

Table 7.5.3-1. (continued)

Common Name/ Scientific Name	Status	Flowering Period	Elevation(ft)	Habitat
Purple starthistle *Centaurea calcitrapa*	B	Jul-Oct	Below 3,300	Disturbed areas
Diffuse knapweed *Centaurea diffusa*	A	Jun-Sep	Below 7,600	Fields, roadsides
Yellow starthistle *Centaurea solstitialis*	C	Jun-Dec	Below 4,300	Pastures, roadsides, disturbed grassland or woodland
Rush skeletonweed *Chondrilla juncea*	A	May-Dec	0-2,000	Disturbed areas
Canada thistle *Cirisum arvense*	B	Jun-Sep	Below 5,900	Disturbed areas
Bermudagrass *Cynodon dactylon*	C	Jun-Aug	Below 3,000	Disturbed areas
Scotch broom *Cytisus scoparius*	C	Mar-Jun	Below 3,300	Disturbed areas
Japanese knotweed *Fallopia japonica*	B	Aug-Oct	Below 3,300	Disturbed areas
French broom *Genista monspessulana*	C	Mar-May	Below 1,600	Disturbed areas
Hydrilla *Hydrilla verticillata*	A	Jun-Aug	Below 650	Ditches, canals, ponds, reservoirs, lakes
Dyer's woad *Isatis tinctoria*	B	Apr-Jun	Below 3,300	Roadsides, fields, disturbed sites
Lens-podded white-top *Lepidium draba ssp chalepense*	B	Apr-Aug	Below 5,000	Disturbed, generally saline soils, fields
Perennial pepperweed, tall whitetop *Lepidium latifolium*	B	Apr-Aug	Below 6,300	Beaches, tidal shores, saline soils, roadsides
Dalmation toadflax *Linaria genistifolia ssp. dalmatica*	A	May-Sep	Below 3,300	Disturbed places, pastures, fields
Scotch thistle *Onopordum acanthium*	A	Jul-Sep	Below 5,300	Disturbed areas
Sakhalin knotweed, giant knotweed *Fallopia sachalinensis*	B	Jul-Oct	Below 1,650	Disturbed areas
Medusahead *Taeniatherum caput-medusae*	C	Apr-Jul	Below 6,900	Disturbed sites, grassland, openings in oak woodlands and chaparral
Gorse *Ulex europaeus*	B	Nov-Jul	0-1,300	Disturbed areas

Sources: United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS); California Invasive Plant Council (Cal-IPC); and DiTamaso 2007.

7.5.4 Botanical Resources in the Yuba River Area

7.5.4.1 Upstream of Project

Licensee found one source document for botanical resources in the Project Area, which is described here.

CNNDB 2009

The North Yuba River above New Bullards Bar Dam drains 480 square miles. Using the CNDDB Quick Viewer, the area upstream of the Project was determined to follow the North Yuba River and run through the Clio, Calpine, Antelope Valley, Loyalton, Beckwourth Pass, Constantina Evans Canyon, Frenchman Lake, and McKesick Peak USGS 1:24,000 topographic

quadrangles. A list of the major and minor communities present in these quadrangles was identified through the CNDDB RareFind program; Licensee conducted a search for plants and communities in the aforementioned areas.

The major communities, characterized as those occurring within five or more topographic quadrangles unless otherwise noted are: lower montane coniferous forest (9 quads); great basin scrub (8 quads); meadows and seeps (7 quads); pinyon-juniper woodland (7 quads); and vernal pools, which only occur in two of the 9 quads but provide important breeding habitat for several classes of terrestrial and semi-aquatic species and are therefore listed under the major community types category. Minor communities are categorized as those present in four or fewer topographic quadrangles and include marshes and swamps (3 quads), bogs and fens (2 quads), upper montane coniferous forest (2 quads), sonoran desert scrub (1 quad), and desert dunes (1 quad) (CDFG 2009a)

HDR|DTA 2009
Special-status plant and noxious weed surveys are being conducted in the spring and summer of 2009 as part of Nevada Irrigation District's (NID) Yuba-Bear Hydroelectric Project and Pacific Gas and Electric Company's (PG&E) Drum-Spaulding Project relicensings upstream of the Project. Studies of riparian and wetland areas, including plants, will be conducted in the summer of 2009 as part of the relicensing effort, as well.

7.5.4.2 In Project Area

Licensee found two source documents for botanical resources in the Project Area. Each of these is described here.

CalVegetation Mapping 2004
Licensee assessed upland vegetation with information from the Forest Service's CalVegetation (CalVeg) mapping system, which are publicly available data. The data were mapped using a Geographic Information System (GIS) database and overlaid in layers depicting a one-mile buffer around the Federal Energy Regulatory Commission (FERC) Project Boundary.[7] CalVeg classifications within this area were quantified using GIS.

The area within the FERC Project Boundary, plus a one-mile buffer around the FERC Project Boundary, encompasses 52,303.42 acres, with the FERC Project Boundary itself encompassing 7,804.97 acres. The Project Area falls within two different CalVeg zones-North Sierran (45,087.26 acres or 86.2% of the total area) and Central Valley (7,216.16 acres or 13.8%). Three vegetation alliances represent 71.5 percent of the area within the one-mile buffer of the FERC Project Boundary: Douglas Fir-Pine (41%); Mixed Conifer-Pine (13.8%); Water (8.5%) and Ponderosa Pine (8.2%). None of the remaining CalVeg alliances represented more than 4.4 percent of the total area. The CalVeg classifications and acreages are summarized in Table 7.5.4-1 and the corresponding GIS maps are attached to this section on compact disk (CD) (Attachment 7.5A) (USDA-FS 2004).

[7] 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.

Table 7.5.4-1. Acres of each CalVeg vegetation classification in the Project Area mapped.

CalVeg Zone	Regional Dominance (by alliance)	Total Acres
Northern Sierran	Agricultural	46.63
	Barren	1,585.69
	Deerbrush	467.84
	Lower Montane Mixed Chaparral	235.03
	Upper Montane Mixed Chaparral	37.5
	Pacific Douglas Fir	447.02
	Douglas-Fir Pine	21,572.03
	Annual Grass-Forbs	312.14
	Wet Meadows (Grass, Sedge, Rush)	7.21
	Mixed Conifer-Pine	7,222.92
	Interior Mixed Hardwoods	316.45
	Gray Pine	225.35
	Ponderosa Pine	3,602.09
	Canyon Live Oak	1,863.05
	Blue Oak	7.77
	White Alder	11.19
	Black Oak	2,088.36
	Willow	7.11
	Tanoak (Madrone)	463.63
	Interior Live Oak	55.42
	Montane Mixed Hardwood	69.93
	Urban/Developed	128.48
	River/Stream/Canal	70.28
	Reservoir	78.89
	Water	4,165.26
	Subtotal	***45,087.26***
Central Valley	Barren	36.84
	Lower Montane Mixed Chaparral	95.52
	Whiteleaf Manzanita	5.12
	Annual Grass-Forbs	1,835.10
	Interior Mixed Hardwoods	6.89
	Gray Pine	1,240.28
	Ponderosa Pine	714.63
	Canyon Live Oak	11.38
	Blue Oak	1,191.07
	Black Oak	214.82
	Valley Oak	86.63
	Interior Live Oak	1,491.51
	Urban or Developed	5.71
	Water	283.66
	Subtotal	***7,216.16***
	Total	**52,303.42**

Based on the CalVeg mapping, the dominant vegetation alliances on New Bullards Bar Reservoir are Douglas-Fir Pine, and Mixed Conifer Pine, with a high percentage of Ponderosa Pine, California Black Oak, and Interior Mixed Hardwood. Log Cabin Diversion Dam and Our House Diversion Dam are predominantly Canyon Live Oak, although Log Cabin also has a high proportion of Douglas-Fir Pine Alliance. Moving down in elevation, New Colgate Powerhouse is a more diverse area, with a mixture of Ponderosa Pine, Interior Live Oak, Lower Montane Mixed Chaparral, Gray Pine, and Annual Grasses/Forbs alliances. At the lowest elevation,

USACE's Englebright Dam and Narrows 2 are predominantly Blue Oak Alliance, with some Gray Pine and Annual Grasses/Forbs alliances.

Tree-Dominated Alliances. Overall, tree-dominated habitats comprised 82 percent of the area (42,909.53 acres). The main CalVeg tree-dominated alliances mapped within the Project Area were Douglas-Fir Pine, Mixed Conifer-Pine, Ponderosa Pine, and Black Oak. A discussion of each tree-dominated habitat is provided below.

- Pacific Douglas-Fir Alliance (DF). The Pacific Douglas-Fir Pine Alliance is present in the North Sierran zone when Douglas-Fir (*Pseudotsuga menziesii*) mixes with Ponderosa Pine (*Pinus ponderosa*) and with the Mixed Conifer-Pine Alliance when additional conifers are present in sufficient quantities. In the Central Valley zone, this alliance occurs on moist or shaded sites in the foothills. The Pacific Douglas-Fir Alliance has been identified as growing in scattered patches, mainly in association with the hardwoods Canyon Live Oak (*Quercus chrysolepis*), Black Oak (*Quercus kelloggii*), and less frequently with Tanoak (*Lithocarpus densiflorus*). This Alliance makes up 0.9 percent (447.02 acres) of the total area and occurs only in the Northern Sierran zone.

- Douglas-Fir Pine Alliance (DP). Pacific Douglas-Fir and Ponderosa Pine are often found growing together below about 6,400 feet elevation in the North Sierran zone. At elevations as low as 900 feet or less, this Alliance is isolated to moist, shady north aspects, and to riparian positions. In these riparian areas, these stands may be associated with hardwoods such as Willows (*Salix* spp.), Bigleaf Maple (*Acer macrophyllum*), and White Alder (*Alnus rhombifolia*). On south, east, and west facing aspects at low elevations, tree associates are more likely to be Gray Pine (*Pinus sabiniana*), Black Oak, Tanoak, Canyon Live Oak, and Interior Live Oak (*Quercus wislizenii*). On higher-elevation north aspects, a transition from this Alliance to the Mixed Conifer Pine Alliance is evidenced by additional traces of Sugar Pine (*Pinus lambertiana*) and White Fir (*Abies concolor*). The shrub type most commonly associated with it is the Lower Montane Mixed Chaparral Alliance containing mixtures of species such as Wedgeleaf Ceanothus (*Ceanothus cuneatus*), Whiteleaf Manzanita (*Arctostaphylos viscida*), and Poison Oak (*Toxicodendron diversilobum*). This Alliance makes up 41.2 percent (21,572.03 acres) of the total area and occurs only in the Northern Sierran zone.

- Mixed Conifer-Pine Alliance (MP). The Mixed Conifer-Pine Alliance is defined by the presence of conifer species, such as Ponderosa Pine, Incense Cedar (*Calocedrus decurrens*), Douglas-Fir, White Fir, and Sugar Pine and the absence or only trace amounts of Jeffrey Pine (*Pinus jeffreyi*). Any one of these species may become locally dominant over small areas but dominance is shared by more than two species in this type. Knobcone Pine (*Pinus attenuata*) may occur as a pioneer species on shallow, south facing slopes or lava flow areas as an additional associate in this Alliance. This Alliance makes up 13.8 percent (7,222.92 acres) of the total area, occurring in the Northern Sierran zone.

- Interior Mixed Hardwood Alliance (NX). The mixture includes any combinations of non-dominant Interior Live Oak, Canyon Live Oak, Valley Oak (*Quercus lobata*), or Blue Oak

(*Quercus douglasii*). Shrubs commonly found in the Lower Montane Mixed Chaparral Alliance such as Wedgeleaf Ceanothus, Poison Oak, and Whiteleaf Manzanita may also occur on these sites. Trees in the Montane Mixed Hardwood Alliance such as Black Oak may be present, but do not form the majority elements in the mixture. Overstory conifers mainly include Douglas-Fir, Ponderosa Pine, and Gray Pine. This Alliance makes up 0.62 percent of the total area (323.34 acres) with 316.45 acres in the Northern Sierran zone and 6.89 acres in the Central Valley zone.

- Gray Pine Alliance (PD). Dominated by Gray Pine but diverse in structure with a mixture of hardwoods such as Black Oak, Blue Oak, Canyon Live Oak and Interior Live Oak, and low-elevation chaparral shrubs such as Wedgeleaf Ceanothus, Whiteleaf Manzanita, and Common Manzanita (*Arctostaphylos manzanita*). In addition to occasional sparse conifers on these sites such as Ponderosa Pine and Douglas-Fir, patches of annual grasses are often found within or adjacent to Gray Pine stands. This Alliance makes up 2.8 percent (1,465.63 acres) of the total area with 225.35 acres in the Northern Sierran zone and 1,240.28 acres in the Central Valley zone.

- Ponderosa Pine Alliance (PP). In the North Sierran zone, this Alliance is defined by pure stands of Ponderosa Pine, which often exist where the conifer is planted for revegetation of areas consumed by fire and in logged areas. At lower elevations such as the Central Valley zone, this Alliance mixes with or is found adjacent to other common foothill conifers such as Douglas-Fir and Gray Pine. On south, east and west aspects, it is likely to be associated with hardwoods such as Blue Oak, Canyon Live Oak, and Interior Live Oak. On open flats and riparian areas, it is likely to be associated with Valley Oaks, and on north aspects, it is likely to be associated with Black Oaks, and in the Granitic and Metamorphic Foothills Subsection, with Tanoak as well. As elevation and site productivity increases, White Fir and other conifers may become established on similar sites and become identified as the Mixed Conifer-Pine Alliance. Shrubs of lower montane areas such as Whiteleaf Manzanita, Wedgeleaf Ceanothus, and Shrub Oaks (*Quercus* spp.) are commonly found on sites within the Ponderosa Pine Alliance. This Alliance makes up 8.3 percent (4,316.72 acres) of the total area with 3,602.09 acres in the Northern Sierran zone and 714.63 acres in the Central Valley zone.

- Canyon Live Oak Alliance (QC). Canyon Live Oak is a well-distributed hardwood that occurs in pure or mixed stands in proximity to various conifers and hardwoods such as Ponderosa Pine, Gray Pine, Jeffrey Pine, Douglas-Fir, Black Oak, and Interior Live Oak among others. As a dominant hardwood in this Alliance, it is generally found on more xeric habitats or in steep canyons at elevations up to 6,200 feet. At low elevations, it may occur on north aspects in contrast to dominant stands of Interior Live Oak, Ponderosa Pine, or Gray Pine, which are more likely to be found on other aspects. Knobcone Pine may associate with it occasionally in mixed conifer-hardwood stands. A mixture of shrubs such as Wedgeleaf Ceanothus, Chamise (*Adenostoma fasciculatum*), and Whiteleaf Manzanita often occur in the understory of this alliance. This Alliance makes up 3.6 percent (1,874.43 acres) of the total area with 1,863.05 acres in the Northern Sierran zone and 11.38 acres in the Central Valley zone.

- Blue Oak Alliance (QD). Blue Oak occurs at the eastern edge of its range in pure or mixed stands in the northern Sierras and on the fringes of the Central Valley zone. It is often found adjacent to the Gray Pine, Ponderosa Pine, and Douglas-Fir-Pine Alliances on gentle slopes below 3,300 feet. On steeper south aspects, Interior Live Oak may become more abundant. In deeper soils or on more shaded sites, Blue Oak may be replaced with Black Oak. Wedgeleaf Ceanothus, Whiteleaf Manzanita, and Poison Oak are scattered throughout this Alliance. This Alliance makes up 2.3 percent (1,198.84 acres) of the total area with 7.77 acres in the in the Northern Sierran zone and 1,191.07 acres in the Central Valley zone.

- White Alder Alliance (QE). White Alder 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 5400 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's Cottonwood (*Populus fremontii*), Elk Clover (*Aralia californica*), Columbine (*Aquilegia formosa*), and Monkeyflower (*Mimulus cardinalis*). This Alliance makes up 0.02 percent (11.19 acres) of the total area and is found in the Northern Sierran zone.

- Black Oak Alliance (QK). Black Oak forms one of the most common and wide-ranging hardwood alliances in the North Sierran zone. As a dominant hardwood, it is found on mesic soils up to an elevation of about 6,600 feet on both west and east slopes in the North Sierran zone, and in more well-drained soils in the Central Valley Zone. Black Oak often intermixes at varying stand densities with Canyon Live Oak, creating mixed stands in the Montane and Interior Mixed Hardwood Alliances. Generally speaking, Black Oak dominates sites with better growing conditions than does Canyon Live Oak. In areas of topographic shading or along riparian corridors, Bigleaf Maple, Dogwood (*Cornus* spp.), White Alder, Tanoak, and Valley Oak may become common, but minor associates. This Alliance makes up 4.4 percent (2,303.18 acres) of the total area with 2,088.36 acres in the Northern Sierran zone and 214.82 acres in the Central Valley zone.

- Willow Alliance (QO). The Willow Alliance is a wide-ranging diverse type on both western and eastern Sierran slopes. Species of treelike Willows 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's 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. This Alliance makes up 0.02 percent (7.11 acres) of the total area and is found in the Northern Sierran zone.

- Tanoak (Madrone) Alliance (QT). Tanoak, a very shade-tolerant evergreen, reaches its northeastern most range limits in the northern Sierras at low elevations, as does its associate Pacific Madrone (*Arbutus menziesii*). This Alliance is defined by the dominance of Tanoak alone or in combination with Pacific Madrone in their areas of overlap in this zone.

Common associates include Douglas-Fir, Ponderosa Pine, Black Oak, Canyon Live Oak, and California Bay (*Umbellularia californica*). This Alliance makes up 1.0 percent (463.63 acres) of the total area and is found in the Northern Sierran zone.

- Interior Live Oak Alliance (QW). Interior Live Oak is another shade-tolerant evergreen. In the North Sierran zone as elevation increases, the associated hardwoods Black Oak and Canyon Live Oak become more prevalent on cooler north and east aspects to form their own alliances at these elevations. Ponderosa Pine and, to a lesser extent, Gray Pine are typical conifer associates of this type. This Alliance makes up 3.0 percent (1,546.63 acres) with 55.42 acres in the Northern Sierran zone and 1,491.51 acres in the Central Valley zone.

- Montane Mixed Hardwoods Alliance (TX). This mixed hardwood Alliance generally occurs on sites favorable to the growth of mid-montane conifers such as Ponderosa Pine and usually above Interior Mixed Hardwood sites. The mixture includes any combination of non-dominant Black Oak, Pacific Madrone, Tanoak, and/or Tree Chinquapin (*Chrysolepis chrysophylla*) in this area. Other species such as Canyon Live Oak or Interior Live Oak may be included, but are not indicator species. The principal overstory conifer associates are Douglas-Fir, Ponderosa Pine and others such as Incense Cedar or Sugar Pine. This Alliance makes up 0.13 percent (69.93 acres) of the total area and occurs in the Northern Sierran zone.

- Valley Oak Alliance (QL). 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 in rolling slopes, generally below 2,000 ft in the north. The present distribution pattern of Valley Oak is 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 0.17 percent (86.63 acres) of the total area.

Shrub-Dominated Alliances. Overall, shrub-dominated alliances comprised 1.6 percent of the area (838.01 acres), with Deerbrush as the most abundant type. A discussion of each shrub-dominated habitat is provided below.

- Deerbrush Alliance (CI). Deerbrush (*Ceanothus integerrimus*) typically occurs in the North Sierran zone as a successional species after stand-replacing disturbances such as fire, landslide, and logging. Its tree associates in this area include Douglas-Fir, Ponderosa Pine, Black Oak, and possibly others in the Mixed Conifer-Pine Alliance. This Alliance makes up 0.9 percent (467.84 acres) of the total area and is found in the Northern Sierran zone.

- Lower Montane Mixed Chaparral Alliance (CQ). A floristically diverse type associated with conifer alliances such as the Douglas-Fir-Pine, Ponderosa Pine, Mixed Conifer-Pine, and Gray Pine. Canyon Live Oak is the typical hardwood of the vicinity. Included in the mixture usually are combinations of Whiteleaf Manzanita, Common Manzanita, Wedgeleaf (*Ceanothus cuneatus*), Lemmon Ceanothus (*Ceanothus lemmonii),* Chaparral Whitethorn (*Ceanothus leucodermis*), Chamise, Fremont Silktassel (*Garrya fremontii*), Wavyleaf Silktassel (*Garrya elliptica*), Birch-leaf Mountain Mahogany (*Cercocarpus betuloides*),

Poison Oak, Shrub Oaks, Hoary Coffeeberry (*Rhamnus tomentella*), and other lower elevation shrub species. This Alliance makes up 0.63 percent (330.55 acres) of the total area with 235.03 acres in the Northern Sierran zone and 95.52 acres in the Central Valley zone.

- Upper Montane Mixed Chaparral Alliance (CX). The Upper Montane Mixed Chaparral Alliance is a very widespread and diverse mixed shrub type. Chaparral species such as Greenleaf Manzanita (*Arctostaphylos patula*), Mountain Whitethorn (*Ceanothus cordulatus*), Snowbrush (*Ceanothus velutinus*), and Deerbrush are indicators of this type. Red Fir (*Abies magnifica*), White Fir, and Ponderosa Pine are often found in the immediate vicinity of this type. This Alliance makes up 0.07 percent (37.5 acres) of the total area and is found in the Northern Sierran zone.

- White Leaf Manzanita Alliance (CW). Whiteleaf Manzanita is the dominant shrub of this Alliance. Typical shrub associates include Chamise, Wedgeleaf Ceanothus, and Common Manzanita. The trees associated with this Alliance include Gray Pine and Blue Oak. This Alliance makes up 0.01 percent (5.12 acres) of the total area and occurs in the Central Valley zone.

Upland Herbaceous Alliances. Overall, upland herb-dominated habitats comprised 4.2 percent of the area (2154.45 acres), with the Annual Grasses and Forbs Alliance as the dominant type and Wet Meadows Alliance comprising a small percentage as well (7.21 acres). A discussion of the Annual Grasses and Forbs Alliance is provided below.

- Annual Grasses and Forbs Alliance (HG). These grasslands are dominated by Cheatgrass (*Bromus tectorum*) and other non-natives, often occurring as a direct result of fire or over-grazing within Eastside Pine or Mixed Conifer-Fir Alliance sites, or Sagebrush (*Artemisia* spp.) areas. This Alliance is the most commonly encountered type of the Central Valley zone, being identified in most mapped areas. In the Central Valley zone, vernal pools occur throughout this Alliance hosting species such as Downingia (*Downingia cuspidata*), Meadowfoam (*Limnanthes douglasii*), Goldfields (*Lasthenia chrysostoma*), Water Starwort (*Callitriche marginata*), Popcorn Flower (*Plagiobothrys* spp.), Johnny-Tuck (*Orthocarpus erianthus*), Bur Medic (*Medicago hispida*), and Linanthus (*Linanthus* spp.). This Alliance makes up 4.1 percent (2,147.24 acres) of the total area with 312.14 acres in the Northern Sierran zone and 1,835.1 acres in the Central Valley zone.

- Wet Meadows (Wet Grasses and Forbs) Alliance (HJ). The Wet Meadows Alliance occurs on aquic soils of level or gently sloping areas in the north Sierran zone. These sites have permanent water sources, occurring adjacent to streams, meadows, lakes, and occasionally as an understory to Red Fir or Lodgepole Pine (*Pinus contorta* ssp. *murryana*) in wet swales. Dominant species are Sedges (*Carex* spp.) and Rushes (*Juncus* spp.) as well as water tolerant grass and forb species. This Alliance makes up 0.01 percent (7.21 acres) of the total area and occurs in the Northern Sierran zone.

Developed/Non-vegetated Alliances. Overall, developed/non-vegetated habitats comprised 12.2 percent of the area (6,401.44 total acres), with water as the dominant habitat type. A discussion of developed/non-vegetated habitat is provided below.

- Agricultural (AG). Agricultural land is used primarily for the production of food and fiber. Agricultural land uses include forest landscapes such as orchards as well as non-forested land uses such as vineyards and field crops. Land used exclusively for livestock pasture may, however, be mapped as Annual Grassland in those cases in which land uses are not recognizable. This Alliance makes up 0.09 percent (46.63 acres) of the total area and is found in the Northern Sierran zone.

- Barren (BA). Barren landscapes are generally devoid of vegetation and include areas such as exposed bedrock, cliffs, interior sandy or gypsum areas, and the like. It usually does not include barren areas considered as modified or developed, as in urban areas. This Alliance makes up 3.1 percent (1,622.53 acres) of the total area with 1,585.69 acres in the Northern Sierran zone and 36.84 acres in the Central Valley zone.

- Urban/Developed (UB). This category applies to landscapes that are dominated by urban structures, residential units, or other developed land use elements such as highways, city parks, cemeteries and the like. In those cases in which the managed landscapes may have a considerable vegetation component, other land use categories may be more appropriate, such as Ornamental Conifer and Hardwood mixtures within city parks. This Alliance makes up 0.3 percent (134.19 acres) of the total area with 128.48 acres in the Northern Sierran zone and 5.71 acres in the Central Valley zone.

- Water (WA). Water is labeled in CalVeg mapping in those cases in which permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams and canals of various size, bays and estuaries, and similar water bodies. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as Wet Meadows, Tule-Cattail freshwater marshes, or Pickleweed-Cordgrass saline or mixed marshes. Islands within water bodies may be mapped according to their terrestrial dominant vegetation types. This Alliance makes up 8.5 (4,448.92 acres) of the total area with 4,165.26 acres in the Northern Sierran zone on 283.66 acres in the Central Valley zone.

- River/Stream/Canal (W1). Natural, flowing surface waters. This Alliance makes up 0.13 percent (70.28 acres) of the total area and is found in the Northern Sierran zone.

- Reservoirs (W3). Man made lakes and ponds. This Alliance makes up 0.2 percent (78.89 acres) of the total area and is found in the Northern Sierran zone.

YCWA 2007

The second source document regarding botanical resources in the Project Area is the 2007 Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed

Lower Yuba River Accord, which includes a description of vegetation communities along New Bullards Bar Reservoir, Narrows Reach, and Daguerre Point Reach.

New Bullards Bar Reservoir is the main landscape/hydrologic feature in the Project Area. The vegetative communities around the reservoir consist primarily of oak woodland intermixed with chaparral and mixed conifer/montane hardwood at higher elevation levels. Species that occur within the oak woodland communities include Interior Live Oak, Blue Oak, and Gray Pine with Poison Oak, manzanita, California Wild Rose (*Rose californica),* and lupine (*Lupinus* sp.) occurring as understory species.

The Narrows Reach extends from USACE's Englebright Dam 2 miles downstream to the mouth of the Narrows Canyon. The channel is steep in this reach and is relegated to a bedrock canyon, encompassing a series of rapids and pools.

Daguerre Point Reach is heavily influenced by mining debris. In 1989, CDFG observed the dominant streamside community to be riparian vegetation (72%). A more recent 2006 reconnaissance survey determined the riparian community consists primarily of shrubby willow species (*Salix lasiolepsis, S. exigua, S. lucida*) interspersed with Fremont's Cottonwood.

7.5.4.3 Downstream of Project

Licensee found one source document for botanical resources downstream of the Project.

YCWA 2007

The source document regarding botanical resources is the 2007 EIR/EIS for the Lower Yuba River Accord, which includes a general description of vegetation communities downstream of the Project, along with more specific descriptions for Garcia Gravel Pit Reach and Simpson Lane Reach.

Downstream of the Project Area, much of the riparian vegetation has been eliminated not only due to the deposition of hydraulic mining debris and dredge mining but to the loss and/or confinement of the active river corridor and floodplain of the Yuba River. Loss and/or confinement of the Yuba River began in the mid-1800's and continues today, although to a lesser degree. In addition, the large deposits of cobble and gravel that remain in the general area downstream of the Project provide suboptimal habitat and therefore, have impaired the re-establishment of riparian species. Another factor playing a role in the vegetative populations in this area is the construction of USACE's Englebright Dam. Construction of the dam further inhibited riparian regeneration by effectively halting the flow of nutrients, sediment, and woody debris from upstream sources common in allochthonous aquatic systems.

Garcia Gravel Pit Reach is characterized by an alluvial valley plain and houses large quantities of hydraulic mining debris from past gold mining operations. In 1989, CDFG determined the dominant communities of the Garcia Gravel Pit Reach to be 35 percent blue oak/gray pine woodland and 44 percent riparian vegetation. A more recent 2005 effort by National Marine Fisheries Service (NMFS) observed a more shaded riverine habitat than that of the adjacent

Daguerre Point Reach. This suggests an improvement in habitat conditions between 1989 and 2005.

In 1989, CDFG determined that the Simpson Lane Reach's dominant community type was also riparian vegetation (78 percent). However, in 2003, the EWA EIS/EIR observed grassland, agricultural fields, and barren land.

7.5.5 List of Attachments

This section includes one attachment:

- Attachment 7.5A: Vegetation Maps (Adobe Portable Document Format).